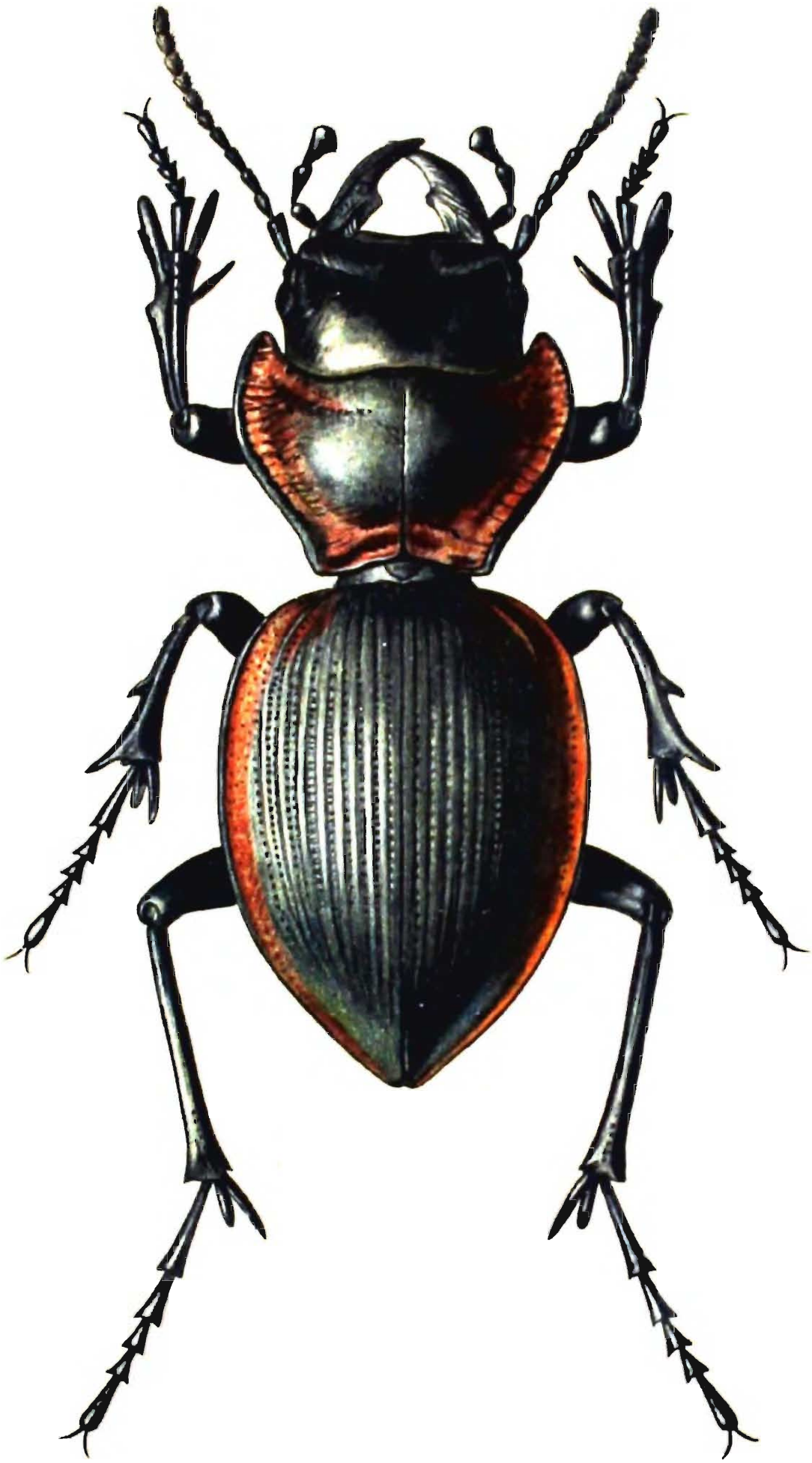


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MOUHOTIA BATESI LEWIS × 2½.

THE FAUNA OF BRITISH INDIA,

INCLUDING

CEYLON AND BURMA.

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EDITED BY LIEUT.-COL. J. STEPHENSON, C.I.E., M.B., D.Sc., I.M.S. (*ret.*).

COLEOPTERA.

CARABIDÆ.

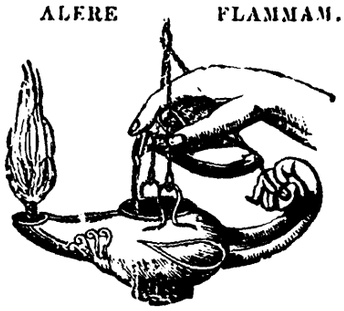
VOL. I.—CARABINÆ.

BY

H. E. ANDREWES.

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AUTHOR'S PREFACE.

WHEN this volume was first planned more than ten years ago, I foresaw that it must take a long time to complete. This has proved to be the case, and the gradual change of views and methods which has necessarily arisen during so long a period must, I fear, have led to some lack of uniformity in the work. Nevertheless, every effort has been made in regard to references, biological notes, localities, etc., to include all available information up to the date of publication.

Of the species dealt with here, comparatively few of the type specimens are to be found in this country, but either by personal visits to various foreign museums and collections, or through the kindness of the museum curators, who have sent them to me for examination, I have been able to see the immense majority of the types in question—a fact which has been indicated in the usual way by an asterisk placed after the names of the species. Very few types have been lost, but I may put on record here that I have been unable to trace those of three authors, (i.) J. F. S. Parry (1845 and 1849), (ii.) J. R. H. N. Van de Poll (1889), and (iii.) J. Bouchard (1903). Parry's species were described so many years ago that I have felt obliged to treat the types as lost, but it is to be hoped that those of the other two authors may yet be discovered.

Of the older collections of Carabidæ, the most important are those of M. de Chaudoir (which included Dejean's collection) and V. de Motchulsky, and among more modern ones those of H. W. Bates and T. S. Tchitcherin. The

collections of Chaudoir and Bates are now in the possession of Mr. René Oberthür, and I must thank him for the kindness shown to me on the occasion of two separate visits to Rennes. Motchulsky's collection is in the University Museum of Moscow; very few of his species are included in this volume, but I have seen the types of these, which, with those of many other species, were sent to me by Mr. Boris Kuzin. I should like here to express my thanks both to him and to Mr. B. P. Uvarov, through whose kindly help I was able to get into touch with the authorities of the Moscow Museum. Tchitcherin's collection is now in the Museum of the Academy of Sciences at Petrograd; he described very few Indian species, and I have seen practically none of the types.

In the British Museum there are, in this family, several old collections of importance, comprising the types of W. S. Macleay ('Annulosa Javanica'), F. W. Hope (Gen. Hardwicke's collection), and F. Walker; among more modern collections are those formed by the late George Lewis in Japan and Ceylon, which include the types of numerous species described by H. W. Bates.

My own collection has quite naturally furnished a considerable share of the material used in the preparation of this volume, but it is also largely based on the rich collections which the authorities at the British Museum have been good enough to place at my disposal, and special thanks are due to Mr. G. J. Arrow, of the Entomological Department, for his invariable courtesy and the willing help he has always given me. I am also much indebted to Prof. E. B. Poulton for the loan of various types from the Hope Collection at Oxford. Much assistance has been received from the Curators and other officials of various European Museums, and my cordial thanks are due to Dr. R. Gestro, of Genoa, who has sent me many of H. W. Bates's types from the Burmese collection formed by the late Leonardo Fea; to Dr. K. L. Henriksen for his kind help when I visited Copenhagen and on other subsequent occasions; to Mr. G. Severin, the late head of the Brussels Natural History Museum, for entrusting me with numerous types of Putzeys; to Mr. P. Lesne, Paris

Museum; Dr. G. Schröder, Stettin Museum; Dr. W. Horn, Deutsches Entomologisches Museum; Dr. H. Kuntzen, Berlin Zoological Museum; Dr. K. Holdhaus, Vienna Museum; Dr. Jan Obenberger, Prague Museum; Mr. H. Gebien, Hamburg Museum; and Dr. A. Borelli, Turin Museum.

My sincere thanks are offered to numerous correspondents in India. Among those associated with the Museums and Research Institutes are the Director of the Zoological Survey of India, with whom I must associate Dr. S. W. Kemp, Dr. F. H. Gravely (now Superintendent of the Madras Museum), and the late Dr. N. Annandale; Mr. T. Bainbrigge Fletcher, Imperial Entomologist, Pusa; Dr. C. F C. Beeson, Forest Entomologist, and Mr. J. C. M. Gardner, Dehra Dun; Mr. E. A. d'Abreu, Nagpur Museum; and Mr. G. M. Henry, Colombo Museum. Among private collectors to whom I am indebted, all of whom have furnished a large amount of material, are my friends Messrs. H. G. Champion, Herbert Stevens, T. R. D. Bell, and my nephew, H. L. Andrewes; to these names I must add those of two deceased friends, G. Q. Corbett and C. Somers-Smith. Of the extensive collection made by Major R. W. G. Hingston on the most recent Mount Everest Expedition, the portion comprising the Carabinæ is dealt with in this volume.

For general help and advice, extending over a long series of years, I am perhaps more indebted to the well known Australian entomologist, Mr. T. G. Sloane, than to any other individual; but considerable assistance has also been received from Mr. M. Bänninger, who has in recent years been working on some of the groups of Carabidæ treated of in this work. I must also mention the names of Dr. G. A. K. Marshall, Dr. M. Cameron, Dr. H. Roeschke, Dr. S. Breuning, Mr. G. Babault, Mr. E. Fleutiaux, Mr. C. R. Cooke, Mr. C. Davies Sherborn, and Dr. A. D. Imms, all of whom have afforded me help of one kind or another, and to all of whom I here express my grateful acknowledgments.

The text-figures are due in about equal shares to Miss Olive E. Tassart and Mr. D. E. Kimmins, to both of whom

I offer my thanks for the great care and accuracy with which they have carried out the work. As to the Plates, the beautiful coloured frontispiece was prepared by Miss Tassart, the three drawings on Plate II. were made in Copenhagen by Mrs. Strubberg, and all the photographs shown on Plates III. to IX. were taken by Mr. B. H. Crawford; to all of them I am greatly indebted for their assistance. I have also to thank Mr. Hans John for the drawing, made in Berlin, of *Carabus barysomus* var. *heroïcus*, Sem., Mr. T. Bainbrigge Fletcher for his illustrations of the pupæ of *Calosoma maderæ* var. *indicum*, Hope, and *Scarites indus*, Oliv., Mr. J. C. M. Gardner for the illustration of the larva of *Calosoma beesoni*, Andr., Dr. C. Bolivar for the block representing *Leïstus kashmirensis* Andr., Dr. Gestro for permission to use the drawings representing microsculpture, and the India Office for the block from Fowler's volume showing *Carabus caschmirensis*, Redt.

Finally, I must record my great obligation to the Editor, Lieut.-Col. J. Stephenson, who has not only superintended the preparation of the Plates, but has also, in the care which he has exercised in the correction of the proofs, been the means of detecting various lapses and discrepancies, which might otherwise have passed unnoticed.

A folding map of India, Ceylon, and Burma will be found at the end of the volume, but this does not, of course, contain all the names of localities mentioned. In the spelling of these names I have tried to follow the orthography of the Indian Postal Guide (the most readily available standard), but the names of some places I have been unable to trace either there or in any map available.

H. E. ANDREWES.

April 1929.

GLOSSARY OF TECHNICAL TERMS.

(*Names of the parts of the body explained in the diagrams and in the text of the Introduction are not included here.*)

♂ indicates the male, ♀ the female.

Acicular, having a sharp point like a needle.

Acuminate, terminating in a point.

Adnate, closely attached to (used of the *paraglossæ*).

Ædeagus, the intromittent organ of the male.

Æneous, brassy.

Alutaceous, with a surface resembling that of soft leather.

Anal, referring (in insects) to the apex of the abdomen.

Apex, that part of the body, or of a limb or appendage of the body, which is most remote from an imaginary line separating the prothorax and hind body.

Appendage, organ attached to the body externally.

Apterous, without wings.

Arcuate, bent like a bow.

Articulation, a joint.

Asperate, rough.

Attenuated, diminished gradually.

Base, that part of the body, or of a limb or appendage of the body, which is nearest to an imaginary line separating the prothorax and hind body.

Bicuspid, with two cusps.

Bifid, cleft into two.

Border, an edge or rim, raised a little above the adjoining surface.

Canaliculate, with one or more channels.

Carina, a keel or narrow raised line.

Catenulate, in the form of a chain (used of the primary intervals of *Carabus*, etc.).

Cerci, the two appendages on the tenth abdominal segment (larvæ).

Chitin, the substance of which the horny integument of Coleoptera and other insects is chiefly composed.

Ciliate, fringed with a row of more or less parallel hairs.

Clavate, terminating in a club.
Compressed, flattened as if by lateral pressure.
Concolorous, of uniform colour.
Condyle, the rounded process at the end of a joint, moving in a socket.
Confluent, running into one another.
Connate, soldered together.
Constricted, contracted as if by pressure from all sides.
Contiguous, adjoining.
Cordate, heart-shaped.
Coriaceous, with a surface like that of leather.
Corneus, horny.
Costa, a rib or raised line, not so narrow or sharp as a *carina*.
Cotyloid cavities, the sockets in which the coxæ move.
Crenate, *Crenulate*, with a notched edge.
Cusp, a projecting point.
Cyaneous, of a dark blue colour.
Cyathiform, in the form of a wide-mouthed cup (*e.g.*, the prothorax in *Siagona*).

Declivous, sloping downwards.
Decurrent, extending downwards.
Deflexed, bent downwards or aside.
Dehiscent, gaping apart.
Dentate, toothed.
Denticulate, furnished with small teeth.
Depressed, flattened as if by vertical pressure.
Digitations, the finger-like processes on the tibia of the *Scaritini*.
Disk, the central portion.
Distal, away from the centre of the body or point of attachment.

Edentate, without teeth.
Emarginate, notched or with the margin as it were removed in the form of a segment of a circle.
Epicranium (*Epicranial*), the dorsal region of head behind clypeus (larvæ).
Eusternum, the anterior of the two main thoracic sternites (larvæ).
Explanate, flattened out.
Extrovert, turn inside out.

Facets, the lenses or divisions of the eye.
Facial carina, *Facial sulcus*, the carina and the sulcus on each side of the head in the subgroup *Clivinides*.
Facies, general aspect of a species, group, etc.
Fascia, a broad transverse band.
Ferruginous, rust-red.
Filiform, thread-like.
Flavous, yellowish.
Fovea, an impression, larger than a puncture, frequently rounded.
Frontal plate, the convex part of the head between clypeus and eye in th subgroup *Clivinides*.

Fulvous, of a tawny yellow colour.

Fuscous, very dark brown, almost black.

Fusiform, spindle-shaped, tapering at both ends.

Geniculate, elbowed or abruptly bent (applied to the antennæ, when the first joint, or scape, is much longer than the others).

Glabrous, smooth, hairless, and without evident sculpture.

Granulate, covered with small round elevations (granules).

Gula, the throat or submentum, that part of the head immediately behind the mentum and buccal fissure.

Hirsute, furnished with long and frequently erect hairs.

Humeral, relating to the shoulder.

Humeral ridge, a short raised line crossing the shoulder obliquely (*Siagonini*).

Hypostoma, lower region of head below the mouth (larvæ).

Imbricate, overlapping one another, like the tiles of a roof (*e.g.*, the scale-like formation on the elytra in the genus *Calosoma*).

Impunctate, without puncturation.

Insertion, point of attachment (especially of the antennæ).

Instar, a stage in metamorphosis between two moults.

Interstices, a term used by some authors with the meaning here attributed to *intervals*.

Intervals, the spaces between the striæ or rows of punctures on the elytra; these are numbered from the suture outwards, the first (sometimes called the sutural interval) being that lying between the suture and the first stria.

Iridescent, exhibiting colours, like those of the rainbow, changing in different lights.

Joint, a word properly meaning an articulation, but commonly (and here) used for the various segments into which some appendages of the body are divided, *e.g.*, the palpi, antennæ, and tarsi.

Lateral grooves, deep longitudinal furrows on each side of the prothorax (*Siagonini*).

Lateral ridges, carinæ running along the sides of the head (*Siagonini*).

Maculate, spotted.

Median, central.

Membranous, of the consistency of parchment.

Mental, referring to the mentum.

Mesolabrum, median lobe of the labrum (larvæ).

Meso-, see Pro-.

Meta-, see Pro-.

Microsculpture, the minute structure of the integument.

Moniliform, like a string of beads (usually applied to the antennæ).

Mucronate, terminating in a *mucro*, or sharp spine.

Notum, dorsal aspect of a segment of the body. Hence *pro-*, *meso-*, and *metanotum*, referring to the three thoracic segments.

Obsolete, almost effaced.

Ocellate, furnished with round spots, surrounded by a ring of a darker colour.

Ocelli, simple, as opposed to faceted or compound eyes.

Orbital, relating to the upper margin of the eye.

Oval, elliptical, equally pointed at the two ends.

Ovate, egg-shaped, more pointed at one end than at the other.

Pectinate, toothed like a comb.

Pedunculate, having a *peduncle*, or supporting piece, joining one part or organ to another, *e.g.*, the produced part of the mesothorax in the *Scaritini* and *Siagonini*, which fits into the base of the prothorax.

Piceous, of the colour of pitch, very dark brown.

Pilose, *Piliferous*, *Piligerous*, bearing one hair, or a number of hairs.

Pleuron, lateral region of the body, connecting tergum and sternum.

Plicate, furnished with a fold or folds (*plica*).

Pores, large, isolated punctures.

Porrect, projecting forwards.

Primary, a term applied to the three principal intervals, which are often catenulate, in the genera *Carabus* and *Calosoma*. An interval or the central one of three intervals lying between two primaries is called a *secondary* interval; one placed between a primary and a secondary is known as a *tertiary* interval. The term *quaternary* interval is sometimes given to rows of minute granules lying between the other intervals.

Pro-, *Meso-*, and *Meta-* refer to the first, second, and third segments of the thorax or organs connected with them, e.g., *prosternum*, *proepisternum*, *proepimeron*, *procoxa*, *protrochanter*, *profemur*, *protibia*, and *protarsus*. Similarly, *mesosternum* etc. and *metasternum* etc. (The term *metatarsus* has been applied to the first joint only of the tarsi of the hind legs, but is here used of the whole tarsus.)

Process, a projecting part, outgrowth.

Produced, extended, continued.

Protelson, a small region in front of the telson.

Proximal, situated towards the centre of the body, or point of attachment.

Pubescent, furnished with a clothing of soft hairs.

Puncta accessoria, minute granules on the front of the ventral region (larvæ).

Punctate-striate, bearing lines of punctures placed in narrow grooves.

Puncture, an impressed point, usually round.

Quadrate, more or less square.

Quaternary, see *Primary*.

Reflexed, bent upwards.

Reticulate, covered with a network of very fine striæ, which form meshes of varied shape.

Rufous, reddish.

Rugose, with a rough surface.

Scape, a term applied to the first antennal joint, when unusually developed.

Sclerite, local area of chitinization of the cuticle.

Scrobe, the wide groove on the outer side of the mandibles (*Carabidæ*).

Scutellary, near the scutellum.

Secondary, see *Primary*.

Securiform, hatchet-shaped.

Segments, the divisions of the insect body (here applied chiefly to the venter).

Serrate, with teeth like a saw.

Seta, a stiff hair.

Setose, *setiferous*, *setigerous*, bearing a seta or setæ.

Shagreened, microscopically roughened and producing a dull effect.

Sinuate, wave-like, curved first in one direction and then in another.

Sinus, a cavity or indentation (used chiefly of the mentum).

Spatulate, furnished with a broad racket-shaped expansion.

Spur, a stout spine (generally at or near the apex of the tibia).

Sternellum (*sternellar*), the posterior of the two main thoracic sternites.

Sternites, sclerites composing the *sternum* or ventral region of the body.

Stria, an impressed line.

Striate-punctate, bearing lines of punctures not placed in grooves.

Stridulation, a shrill noise, produced by friction between two hard surfaces.

Strigose, finely and irregularly scratched.

Striole, a term applied to (i.) the short striæ frequently present on each side of the scutellum, (ii.) the recurved stria near the apex of the elytra in the genera *Trechus* and *Tachys*.

Sub-, in composition signifies almost, or slightly.

Submentum, see *Gula*.

Subocular ridge, a transverse ridge, with a groove in front of it, beneath the head and behind the eye (*Omophron*).

Subulate, terminating in a sharp point like an awl (chiefly used of the last joint of the palpi in the *Bembidiini*).

Sulcate, furrowed, or provided with one or more sulci, which are wider and deeper than *striæ*.

Supra-, in composition signifies above (*e.g.*, the *supraorbital setæ* on the head, the *supramaxillary plates* in the genus *Siagona*).

Suture, the line along which two edges meet (*e.g.*, clypeus and labrum, or the elytra).

Tegmen, *tegmina*, sometimes used of the overhanging margins of the tergites (larvæ).

Telson, the supra-anal plate, an appendage of the tenth abdominal tergite, covering the anus (larvæ).

Tergites, sclerites composing the *tergum* or dorsal region of the body.

Tertiary, see *Primary*.

Testaceous, a clear brownish yellow, like the paler markings on tortoise-shell.

Tomentose, clothed with dense soft hairs.

Transverse, a word used with two significations, (i.) wider than long, (ii.) in a cross-wise direction.

Trapezoidal, in the form of an irregular, four-sided, rectilinear figure.

Truncate, ending abruptly, as if cut across in a straight line.

Tubercle, a small, abrupt elevation.

Tumid, swollen.

Umbilicate, a term used of a puncture with a slight central raised area.
Unicolorous, uniformly coloured.

Venter, the lower surface of the abdomen (in the *Carabinæ* there are six segments, numbered from 1 (basal) to 6 (apical)).
Vermiculate, with irregular, sinuous markings or striæ.
Vitta, a stripe, or longitudinal marking.

Wings, in addition to the normal use of this word for the organs of flight, it signifies in the subgroup *Clivinides* the lateral parts of the clypeus.

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INTRODUCTION.

Suborder **ADEPHAGA.**

THOUGH in past times this suborder has been known by the names of CARNIVORA and CARABOIDEA, the name of ADEPHAGA is now more generally used and has been adopted here; the suborder comprises an assemblage of insects, which from the characters they display are now generally regarded as amongst the most primitive of the Coleoptera. The antennæ are generally filiform, though sometimes moniliform or irregular, the tarsi 5-jointed, the hind wings with an *oblongum* nearly always present, and the larvæ mainly campodeiform.

As Fowler, in his General Introduction to the Series Coleoptera, has already provided a historical summary of the suborder up to the date (1912) when his volume was published, it seems hardly necessary to reproduce it here. His table of families was largely founded on that contained in Ludwig Ganglbauer's admirable work 'Die Käfer von Mitteleuropa,' of which the first volume appeared in 1892, and which approximately represents present-day opinion.

One work has since appeared which may be studied with advantage by those interested in the taxonomy of the Coleoptera, namely the "Essay on Classification" prefixed by Mr. C. W Leng to his 'Catalogue of the Coleoptera of America, North of Mexico' (1920). This contains a valuable synopsis of the various systems of classification from the time of Linnæus to the present day, including those of Leconte, Schaum, Sharp, Kolbe, Lameere, Ganglbauer, and others, based on numerous characters, such as those presented by the tarsi, the venation of the hind wings, the genitalia, the larval form, etc. Substantially, however, Mr. Leng's system in regard to the Adephaga does not differ greatly from that set forth in Fowler's table, except that he excludes *Omophron* from the CARABIDÆ, and, following Lameere, makes for it a separate family OMOPHRONIDÆ; the RHYSODIDÆ and CUPEDIDÆ are also excluded, and the PAUSSIDÆ are apparently not referred to.

Fowler's key to the families has been remodelled by Dr. A. D. Imms in his 'General Textbook of Entomology' (1925) and, with his permission, is reproduced below :—

1 (16) Six or seven (rarely eight) visible ventral abdominal segments, the first three connate, but with the sutures apparent.
2 (11) Metasternum with a transverse suture before posterior coxæ.
3 (8) Transverse suture extending across metasternum, the latter continued as an angular process between the posterior coxæ.
4 (7) Posterior coxæ normal: antennæ 11-jointed.
5 (6) Clypeus extending laterally before bases of antennæ ..... CICINDELIDÆ.
6 (5) Clypeus not extending laterally before bases of antennæ ..... CARABIDÆ.
7 (4) Posterior coxæ very large and plate-like: antennæ 10-jointed ..... HALIPLIDÆ *.
8 (3) Transverse suture very short, not extending across metasternum, the latter not prolonged between the posterior coxæ.
9 (10) Anterior coxæ conical: tibiæ and tarsi with swimming-hairs ..... PELOBIIDÆ.
10 (9) Anterior coxæ globular, no swimming-hairs .. AMPHIZOIDÆ.
11 (2) Metasternum without a transverse suture before posterior coxæ.
12 (15) Posterior coxæ contiguous: legs natatorial.
13 (14) Eyes not divided; antennæ normal ..... DYTISCIDÆ.
14 (13) Eyes divided: antennæ very short, auriculate. GYRINIDÆ.
15 (12) Posterior coxæ widely separated: legs ambulatorial: antennæ moniliform ..... RHYSODIDÆ.
16 (1) Abdomen with less than six visible ventral segments: antennæ usually more or less abnormal.
17 (18) Abdomen with five visible segments, basal ones connate, with no apparent suture; antennæ usually 2-jointed, sometimes 6–11-jointed, nearly always abnormally developed ..... PAUSSIDÆ *.
18 (17) Abdomen with five free ventral segments; antennæ 11-jointed, filiform ..... CUPEDIDÆ.

Family CARABIDÆ.

The first and I think the only attempt to deal comprehensively with this immense family, after the pioneer work of Linnæus, Fabricius, Olivier, and Latreille, was made by Dejean, but even a hundred years ago he found the task too great, and in the five volumes of his 'Species général des

* Mr. T. G. Sloane holds the view that there is a small extra joint in the antennæ of both the Haliplidæ and Paussidæ (Trans. Ent. Soc. Lond. 1921 (1922), p. 590).

Coléoptères' (1825–31) he deals only with the material in his own collection. The first volume of Lacordaire's great work 'Genera des Coléoptères' appeared in 1854, and is further referred to under 'Classification.' During the second half of last century Chaudoir published numerous monographs on groups or genera, and amongst other authors who have added to our knowledge must be mentioned Erichson, Leconte, Schaum, Schiødte, Putzeys, G. H. Horn, H. W Bates, D. Sharp, T. S. Tchitcherin, and T. G. Sloane. Other memoirs, either faunistic or monographing special groups, have appeared during more recent years, but it seems now beyond the power of any one man to deal with the family as a whole, as Dr. W Horn has dealt with the nearly related but much smaller family of the CICINDELIDÆ. I find that in Gemminger and de Harold's Catalogue (1868) 8516 described species are enumerated, and probably the number has at least doubled during the intervening sixty years.

The CARABIDÆ and CICINDELIDÆ, apparently so readily distinguishable in the majority of cases, are, in fact, separable by one character only, viz., the clypeus, which in the latter is as wide as, in the former narrower than, the distance between the points of insertion of the antennæ. Some interesting points of similarity between various groups in these two families are mentioned by Dr. W Horn on p. 70 of his Monograph (Wytsman).

CARABIDÆ, or "ground-beetles" as they are sometimes called, occur throughout the world; at one time they were believed to be less numerous in warm than in temperate regions, but my own experience in India did not confirm this. In the palæarctic regions they are frequently true "ground"-beetles, the elytra often being soldered together and the hind wings atrophied; it is usually at night only that they come out to forage, while during the day they lie concealed under stones, logs of wood, in moss, etc. In tropical and subtropical regions, however, the hind wings are often well developed, though they are used only or chiefly at night, when many species are readily attracted to light.

In the following pages some account is given of the structure of the imago, the biology, including the larval forms, the superficial clothing, the hind wings, sexual dimorphism, microsculpture, stridulation, economic importance, and geographical distribution. No attempt has been made to deal with the internal organs, or the processes of digestion, respiration, circulation, and reproduction, which seem to lie rather outside the scope of a work of this kind. Nor is there any discussion of phylogeny, a fascinating but obscure subject, though attention may be drawn to A. Lameere's 'Notes pour la classification des Coléoptères' (1900 and 1903), Anton

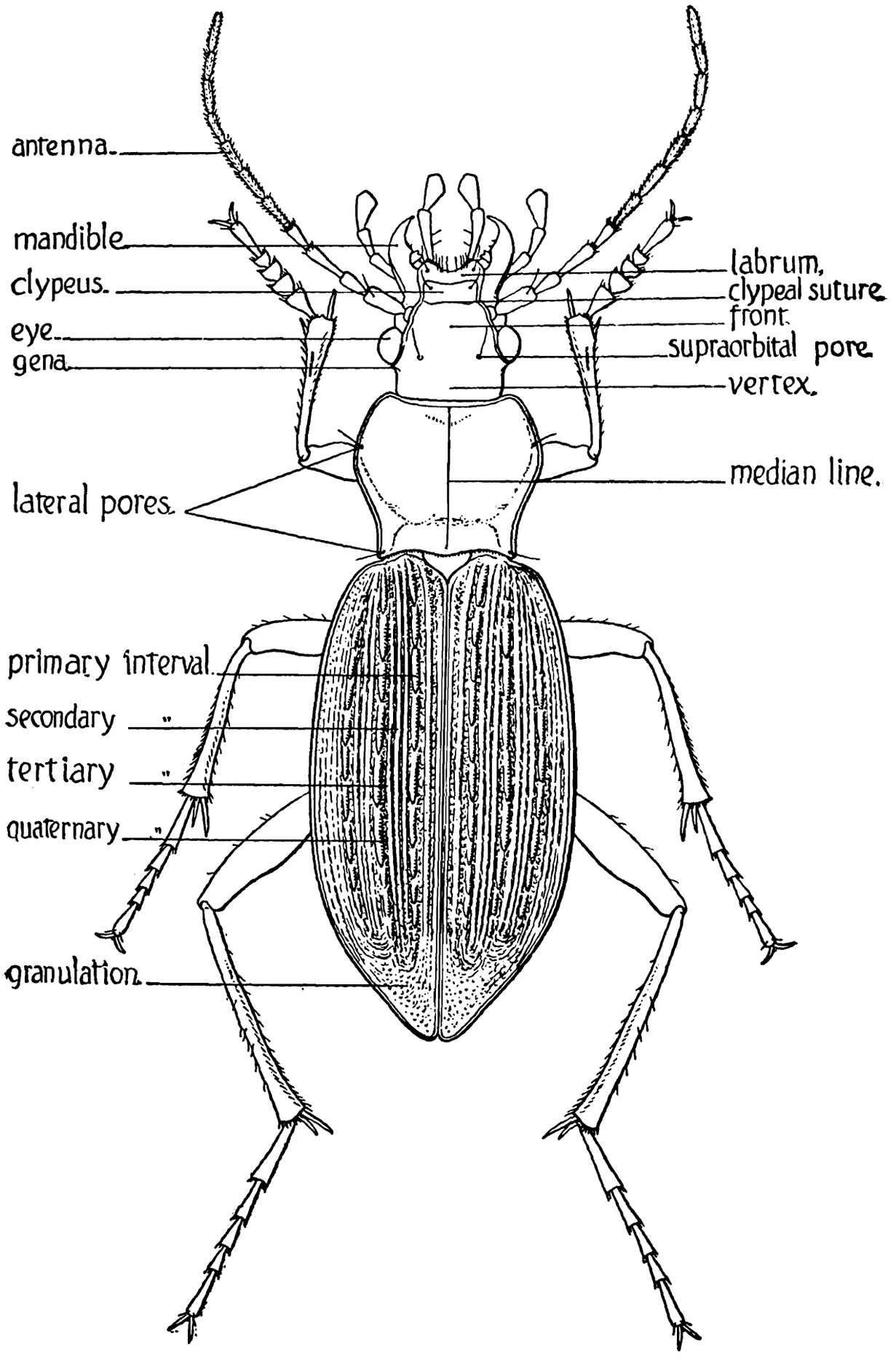


Fig. 1.—*Carabus indicus*, Fairm., ♂.

Handlirsch's 'Die Fossilen Insekten und die Phylogenie der rezenten Formen' (1906–8), and C. J. Gahan's paper "On some recent attempts to classify the Coleoptera in accordance with their phylogeny" (Entom. xliv, 1911, pp. 121 *et seqq.*).

Structure of the Imago.

Head.—The form of the head varies a good deal, but it is nearly always narrower than the prothorax. The clypeus is generally bisetose, sometimes quadrisetose; it is narrower than the space between the points of insertion of the antennæ, and the clypeal suture, which separates the clypeus and front, is usually well marked, though sometimes obsolete. In the *Clivinides* the clypeus is more or less separated into three sections, a median part and a "wing" on each side. The supraorbital setæ on each side, on or near the upper margin of the eye, are of considerable importance, as, owing to their constancy, both in number and position, they are of great value in classification. Except in very rare cases the number is either one or two, but in *Mouhotia* and in nearly all the *Pseudomorphini* they are absent, while in *Chætobroscus* there are generally from three to five, and in *Amolops* from five to seven. On each side of the front is a longitudinal depression, which sometimes extends on to the clypeus; these depressions are known as the frontal foveæ or frontal impressions, and they are rarely absent. In *Scarites* the head is wide and the front angles are more or less truncate, while in *Clivina* the sides in front form convex areas known as "frontal plates." Occasionally the neck is constricted, and, when this is the case, the constriction is often punctate. The surface is sometimes smooth, but more often punctate, and does not exhibit, even in the male, any of those horns and processes so common in some of the Lamellicornia. Occasionally there is a small central tubercle, as in *Thlibops*, and in many of the *Clivinides* there are ridges and impressions, which sometimes almost form a pattern (*Coryza* and *Trilophus*), while in *Siagona* there is on each side a narrow lateral ridge.

At the sides of the head, behind and beneath the eyes, are the genæ, normally but little developed, but in some genera, e. g., *Scarites*, prominent and occasionally (*S. boucardi*, Chaud.) extending laterally considerably beyond the level of the eye. On the underside, two longitudinal gular sutures are present near the middle, and a transverse suture separates the mentum from the submentum or gula; very rarely, as in *Siagona*, this latter suture disappears altogether. The gula frequently bears a pair of setæ, one on each side, but this number may be increased until there are as many as a dozen setæ, placed in a transverse row behind the suture; rarely, as in some

species of *Leïstus*, there is a transverse ridge, sometimes bearing tubercles, from which the setæ spring. On each side of the mentum is a more or less longitudinal slit, known as the "buccal fissure," in which the maxillæ move; the area between this fissure and the eye is not as a rule greatly developed, but in the *Scaritides* and *Oxylobides* there is immediately beneath the eye a more or less developed groove for the reception of joint 1 of the antennæ when at rest, and between this and the buccal fissure an area, moderately wide at the base, but tapering towards the apex, known as the "paragena." The inner margin of the paragena is sometimes straight, but more often dentate and with an emargination above the tooth. In the PSEUDOMORPHINI (not represented in our region) there is a groove on the underside of the head for the reception of at least the basal portion of the antennæ, and in the genus *Zelma* there is a groove on each side beneath both head and prothorax, which receives the whole of the antenna. In *Omophron* there is a "subocular ridge," with a groove in front of it, behind the eye, and in most of the BROSCINI a "temporal ridge" (or suture), running from near the eye to the margin of the prothorax.

Eyes.—These organs are usually moderately prominent, very large in *Notiophilus* and *Elaphrus*, very prominent in some species of *Asaphidion*, sometimes small and flat, rudimentary, or even wanting (*Anophthalmus*), but no eyeless species has yet been discovered in India. As a rule, the eyes are finely and clearly faceted, but among the SCARITINI the eyes in the *Clivinides* have, as a rule, coarser facets than in the *Scaritides*, while in *Thlibops*, a genus in which the eyes are so much enclosed by the genæ that they can often only be seen through a narrow slit, the facets are hardly distinguishable. In *Tachys truncatus*, Nietn., and its allies, the eyes are pubescent.

Labrum.—The labrum is generally transverse, truncate or emarginate in front, rather strongly emarginate in some species of *Carabus*, deeply cleft in the CYCHRINI. The sides are normally ciliate, and the front margin bears a variable number of setæ, of which the two outer ones are generally the longest. The number of these setæ, though not constant in a genus, and not always even in a species, is nevertheless often a useful character and is sometimes of assistance in splitting up the species of a large genus (e. g., *Clivina*) into groups. In the SCARITINI the front margin is often trilobate, and in some species of *Dyschirius* conspicuously tridentate.

Mentum.—The mentum, which is of very varied shape, consists normally of two lobes, united behind, but separated in front by a more or less deep emargination, which is sometimes without, but more frequently with, a tooth present in it, rounded or pointed at the apex, and sometimes bifid. The

sides of the emargination, and of the tooth, when present, are usually more or less expanded, such expansion being known as the "epilobe." In *Brachylobus*, *Abacetus*, *Lesticus*, and *Trigonotoma* the emargination is slight, the front edge being sometimes merely bisinuate. In some species of *Scarites* a carina runs along the outer edge of each lobe. In certain species of *Tachys*, just below the tooth, are two large rounded pores, and their presence or absence affords a useful character for the primary subdivision of this enormous genus. Similar, though less developed, pores are found in some of the TRECHINI and are referred to by Dr. R. Jeannel (Abeille, xxxii, 1926, p. 301), who thinks they are probably auditory organs. A pair of setæ, one on each side of the base, is often present, and sometimes there is also a seta on each side at the base of the tooth.

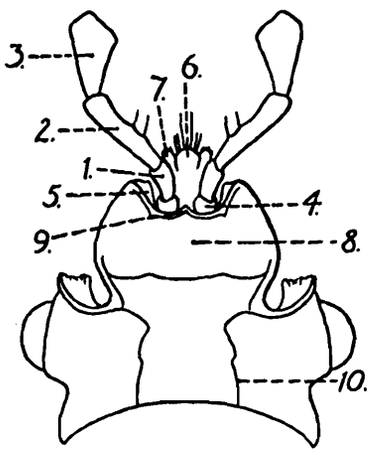


Fig. 2 *a*.—Underside of head of *Carabus indicus*, Fairm.

1, 2, 3. Joints of labial palpus.
4. Squama palpigera.
5. Epilobe of mentum.
6. Ligula.
7. Paraglossa.
8. Mentum.
9. Tooth of mentum.
10. Gular sutures.

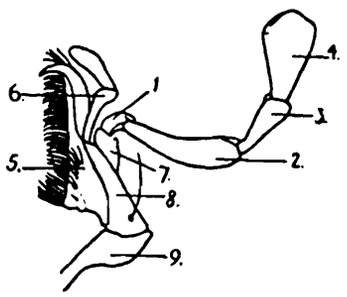


Fig. 2 *b*.—Maxilla of *Carabus indicus*, Fairm.

1, 2, 3, 4. Joints of maxillary palpus.
5. Inner lobe of maxilla.
6. Outer lobe of maxilla.
7. Squama palpigera.
8. Stipes.
9. Cardo.

Mandibles.—The mandibles or outer jaws are nearly always powerful, wide at the base, pointed at the apex, the outer margin rounded; exceptions, however, occur, and in the LICININI they are truncate or even emarginate at the apex, while in the genus *Acinopus* they are asymmetrical, often with a deep emargination on the outer side of the right mandible. The outer side of the basal half is usually hollowed out, this part being known as the "scrobe," and in it towards its apex there is sometimes present a single seta, an important character in classification. The upper surface is frequently smooth, but sometimes striate (e.g. *Calosoma*). The inner margin is

generally toothed, at least near the base, and as, when the mandibles are closed, the teeth of each one fit closely into corresponding emarginations of the other, there is a certain degree of asymmetry, occasionally very noticeable, as in the well-developed mandibles of some species of *Scarites*. The abnormal development of the mandibles which sometimes occurs in the male is noticed under "*Sexual dimorphism.*"

Ligula and paraglossæ.—The ligula is normally more or less concealed from view and difficult to examine *in situ*. It is of very varied shape, but as a rule it is corneous, dilated at apex, truncate, and either bisetose or plurisetose. In *Leïstus* it is long, slender, and trifurcate at apex; in *Anthia* it is very long, spatuliform, and chitinous; in *Scarites* and its allies it is very short, setose, and quite concealed by the tooth of the mentum, to which it is adnate. The paraglossæ are generally membranous, sometimes "free," *i. e.*, attached to the ligula at the base only, sometimes partially or wholly adnate to the ligula, frequently longer than and occasionally completely surrounding the ligula, at times so completely fused with it, that they have disappeared (*Eustra, Siagona*). The paraglossæ may be wide or narrow, glabrous or finely setose, the latter distinction providing a character sometimes useful in classification.

Maxillæ.—Each of the maxillæ, or inner jaws, is attached to the head by the *cardo*, or hinge, and consists of three parts: (i.) an inner lobe (*lacinia*),(ii.) an outer lobe (*galea*), (iii.) an externally attached *palpus*. The inner lobe is long, narrow, and inwardly fringed with fine bristles, or hairs, which sometimes also extend to or cover the apex; as a rule it terminates in a sharp hook, directed inwards, though sometimes the hook is below the apex. This hook is articulated in the *Cicindelidæ* but not in the *Carabidæ*, though in the HEXAGONIINI it is at least functionally mobile. Occasionally it has disappeared altogether (e. g., *Oxylobus, Colfax*), and the inner margin is consequently quite straight. The outer lobe is elongate and nearly always articulated at about the middle to form two joints, though exceptionally the lobe is in one piece; genera with a non-articulate outer lobe are *Monolobus, Amerizus, Homethes, Stenocheila, Callistus, Callistomimus, Prionognathus,* and *Sphærodes*. The two lobes are normally pressed tightly together, and usually the outer is a little longer than the inner one: in *Oxylobus* the two lobes are about equal in length. In the CYCHRINI the outer lobe is much dilated and largely envelops the inner one.

Palpi.—The *maxillary palpus* is attached to the base of the maxilla on its outer side by the *stipes*, which articulates with the distal end of the cardo, and has at its other extremity a small piece called the *squama palpigera*, supporting the palpus.

This is four-jointed and the joints are generally referred to in this volume by number, from 1 the basal to 4 the apical joint; of these joint 1 is generally small, but the other three are of variable length and form, joint 4 in particular being sometimes cylindrical, sometimes securiform, but in the BEMBIDIINI very minute and subulate. The surface is often glabrous, but sometimes pubescent (*Siagona*, *Macrocheilus*).

The *labial palpus* is attached by a *squama palpigera* to the base of the ligula, and consists of three joints; as in the case of the maxillary palpi, these are referred to by number in the following pages from 1 the basal to 3 the apical joint. Joint 1 is usually small, but the other two are very variable, both in form and length. Joint 2 normally bears some setæ on its inner margin, but occasionally it is glabrous (e. g., *Chlænius spoliatus*, Rossi, *Colfax stevensi*, Andr.); sometimes it is bisetose, sometimes plurisetose, the difference affording a very useful character, which has been largely used in the classification of the family. Joint 3, the apical one, is generally somewhat dilated from base to apex, sometimes securiform, occasionally hollowed out at its extremity (some species of *Chlænius*); in certain genera (*Licinus*, *Trigonotoma*, *Cymindis*, etc.), this joint is strongly securiform in the male, but only moderately dilated or even undilated in the female.

Antennæ.—The antennæ are 11-jointed, and in the following pages the joints are treated as numbered from 1 the basal to 11 the apical joint. They are inserted immediately behind the mandibular articulation, and are usually free at their base, though sometimes arising under a plate or ridge (SIAGONINI, ENCELADINI, PROMECOGNATHINI). As a rule they are filiform, though in some groups moniliform (e. g., *Clivinides*), occasionally very slender (*Leïstus*), or, on the contrary, very thick (*Pseudozæna*, *Itamus*, etc.). In some genera the joints become slightly wider towards the apex, and in such cases they are usually somewhat flattened. The relationship in length between the three or four basal joints often provides a convenient means of separating species or groups of species. Joint 1 is normally thicker and longer than those immediately following it, and also bears a seta, sometimes two setæ, at its apex; otherwise from two to four basal joints are generally glabrous, except sometimes for a few hairs at the apex on 3 and 4, the remainder being closely pubescent. In *Scarites* and its allies the antennæ are geniculate, joint 1 being scapiform, and, when at rest, lying in a groove beneath the eye; in *Siagona* joint 1 is elongate and strongly clavate, and all the joints are more or less pubescent. In *Loricera* joints 2 to 4 are irregular in shape and are also provided with long bristles.

Prothorax.—The form of the prothorax is, as a rule, either quadrate or cordate, cyathiform in *Siagona*. The base is

generally more or less truncate, the apex a little emarginate. The lateral setæ, placed either in the marginal channel or on the border, are important features; there may be a row of setæ (e.g., *Chætobroscus anomalus*, Chaud.), but normally two are present, one somewhere on the front half, the other at or near the hind angle. Throughout the large group of the HARPALINI, however, the hind seta is wanting, except in the palæarctic genera *Diachromus* and *Dichirotrichus*, and in the Indian species *Gnathaphanus lævistriatus*, Sturm. Occasionally, as in *Nebria superna*, Andr., and *Mouhotia batesi*, Lewis, the lateral setæ have disappeared altogether. The sides are nearly always bordered, but the border may extend only from the apex to a point at or near the hind lateral pore, as in most species of *Dyschirius* and in *Trilophus*, or it may even vanish altogether, as in the genus *Apotomus* and in *Dyschirius porosus*, Putz. A longitudinal central furrow, called the "median line," is practically always present, together with a narrow transverse furrow, the "front transverse impression," running nearly parallel with the front margin, and a second wider but vaguer "hind transverse impression," parallel with the base, but often tending to become obsolete. There are also two further basal impressions generally present, one on each side, called the "basal foveæ"; they are of very varied shape, but, except sometimes in the SCARITINI, they are not often altogether wanting. In the SIAGONINI they are replaced by two lateral furrows, which run from base to apex, about parallel with the median line. The recurved part, beneath the body, connecting the pronotum with the prosternum, is called the *propleuron*.

Elytra.—The elytra, or wing-cases, cover the whole of the hind body, except in the LEBIINI, where they are more or less truncate and nearly always leave at least the apical abdominal segment exposed. The recurved part beneath the body at the sides is called the *epipleuron*; this is usually moderately wide near the shoulder and decreases gradually in width till it disappears a little before the apex, but in the CYCHRINI the epipleura are very wide and largely envelop the hind body. Between the elytra at the base is a small triangular piece called the *scutellum*, but in genera in which the mesothorax is produced into a peduncle, the scutellum is usually placed on it. In many species there is on the underside a longitudinal plica, terminating not far from the apex, where, as a rule, the border is slightly emarginate. The presence of this plica and the mode of its termination behind, *i.e.*, whether interrupting the elytral border or not, are taxonomic characters of great value in differentiating the groups among the HARPALINÆ.

The striation of the elytra is one of the most varied characters they present, for the number of striæ may in the CARABINÆ be

as many as 15 or 16, as in some species of *Calosoma*, *Carabus*, and *Omophron*, and in the HARPALINÆ up to 25, as in *Galerita* and *Planetes*; on the other hand, the striæ may have disappeared altogether, as in *Luperca* and *Siagona*. Normally, however, the number of striæ present is nine, and they are numbered from (but excluding) the suture outwards. A short stria, called the "scutellary striole," is often present on each side of the scutellum, and in *Tachys* and *Trechus* stria 1 is usually recurved at the apex to form an "apical striole." The scutellary striole has been regarded as the relic of a tenth stria, and on this point and generally on the morphology of the elytron two recent works may be consulted, viz., that of Mr. T. G. Sloane, "On the Scutellar Striole of the Carabidæ" (Proc. Linn. Soc. N. S. Wales, 1920, p. 113), and that of Dr. R. Jeannel, "Morphologie de l'élytre des Coléopteres adéphages" (Arch. Zool. exptl. & gén. 1925, pp. 1–84). The striæ tend to disappear from without inwards, so that stria 1, which is nearest the suture, is the last to go, and is, in fact, almost always present. The striæ are generally impressed and frequently punctate, but sometimes there is no linear impression and their site is indicated by punctures only.

The intervals are flat, convex, costate, even cariniform (in some species of *Oxylobus*), and, like the striæ, are numbered from within outwards, the interval adjoining the suture being treated in this work as number 1. The setiferous punctures usually present on the intervals are of considerable importance, though sometimes they are wanting; these setæ appear to represent the "macrotrichia" placed along the course of alar veins in the more primitive insects from which the Coleoptera are derived. They are almost confined to the odd intervals, and in most genera are found only on intervals 3 and 9. A basal border may be present or absent, but a lateral border is seldom wanting; the latter is usually smooth, but occasionally serrate, especially behind the shoulder, where the teeth can easily be seen with a microscope, or even with a magnifying glass, in some species of *Calosoma*, *Omophron*, *Bembidion*, *Tachys*, *Peripristus*, etc. The elytra are rarely armed, but in some genera, e. g., *Catascopus* and *Colpodes*, there may be stout spines at the apex.

Sternum and *coxal cavities*.—The sternum consists of three parts, the *pro-*, *meso-*, and *metasternum*, each of which is again divided into three sections. The *sternum* occupies the central area, with the *episterna* at each side, and the *epimera* behind them. The sutures separating these parts are generally visible, but tend sometimes to disappear, as in the prosternum of *Apotomus*. The mesosternum is sometimes carinate in front (CARABINI), or wide and flat (SIAGONINI), or hollowed out and adapted to the prosternal process (CALATHUS). The

position of the mesepimera is of the first importance, because it determines the main division of the family; in the CARABINÆ they reach the mesocoxal cavities, and in the HARPALINÆ they do not. The metasternum is divided transversely by a suture into two parts, and there is often a median longitudinal furrow as well. At its extremities are processes, which extend in front between the mesocoxæ and behind between the metacoxæ. The metepisterna in their form and length present another very useful means of discriminating species or even groups of species.

Mr. T. G. Sloane has recently summarized what was previously known regarding the coxal cavities and himself added

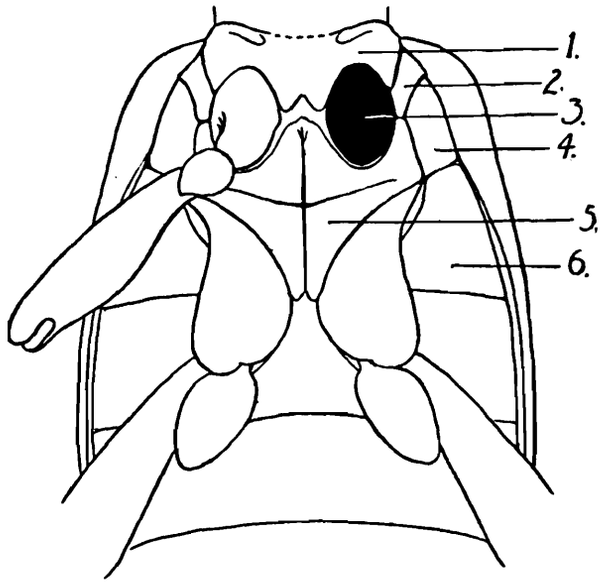
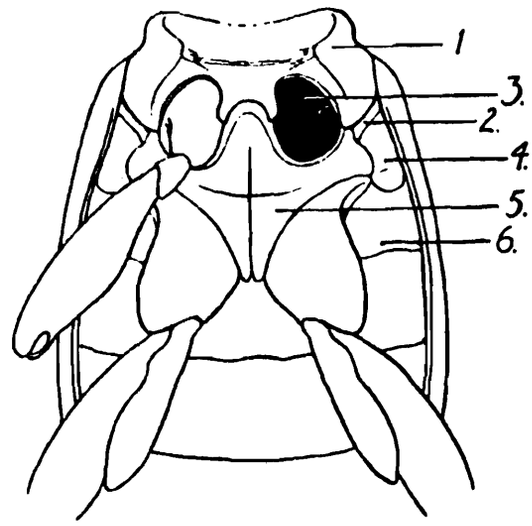


Fig. 3 *a*.—Underside of *Carabus indicus*, Fairm.

1. Mesepisternum.
2. Mesepimeron.
3. Mesocoxal cavity.
4. Metepisternum.
5. Metasternum.
6. First ventral segment.



Fig, 3 *b*.—Underside of *Pterostichus championi*, Andr.

1. Mesepisternum.
2. Mesepimeron.
3. Mesocoxal cavity.
4. Metepisternum.
5. Metasternum.
6. First ventral segment.

to our knowledge of them (Trans. Ent. Soc. Lond. 1923, p. 238). He says very truly: "The modifications of the parts of the prosternum and mesosternum which enter into the formation of the anterior and middle coxal cavities are now the leading features in the Classification of the CARABIDÆ." In the procoxal cavities there are three main forms: (1) the open form, in which the cavities are open behind and the coxæ contiguous; (2) the wholly closed form, in which the cavities are closed behind by a basal declivity separating the coxæ; (3) the partially closed form, without basal declivity separating the coxæ, the cavities closed on each side behind by the union of the epimeron with the prosternum. Mr. Sloane found that

there were two forms of the wholly closed cavity, one with two openings and another with a single opening inwards; this is referred to at greater length under "Classification." In the Australian genus *Silphomorpha*, there is yet another form of closed cavity in which "the posterior foramen of the biperforate form has been lost and the point of the epimeron has moved forward and become attached to the crossbar of the cavity, the result being a single opening inwards, which is the homologue of the anterior foramen of the biperforate form, and not the single opening of the uniperforate form." The mesocoxal cavities are usually confluent, but separated in the PROMECOGNATHINI and in some genera of the OZÆNINI. The metacoxal cavities may be either contiguous or separated.

Abdomen.—Normally there are visible eight dorsal and six ventral segments, numbered from base to apex, the first or basal ventral segment lying opposite the second dorsal one, but the BRACHININI have seven visible ventral segments in the female and eight in the male. The three basal segments are soldered together, though the sutures are clearly visible: segments 4 to 6 are sometimes transversely sulcate, a useful feature for separating groups of species, though hardly of generic value. The venter is occasionally pubescent, but more often glabrous, with a pair of setæ on each segment, one on each side of the median line; sometimes there is a transverse row of two or three or even more setæ on each side. On the apical margin of the last segment there are often two setæ on each side in the female and one in the male, but this is referred to again under "Sexual dimorphism."

Legs.—There are two principal forms, viz., that in which the legs are adapted for running, the normal form, and that in which they are adapted for burrowing (SCARITINI). The three pairs of legs are attached to the three segments of which the thorax consists, and each leg is formed of five parts: (i.) the *coxa*, which articulates with the body; (ii.) the *trochanter*, a small piece connecting the coxa and femur; (iii.) the *femur*; (iv.) the *tibia*; (v.) the *tarsus*.

The *pro-* and *mesocoxæ* are more or less globular, the *metacoxæ* are inserted obliquely in the body and produced inwardly behind; the last-named, as a rule, just reach the metepimera in front, though in *Trachypachys* they extend to the sides of the body and completely separate the sternal and ventral surfaces.

The *pro-* and *mesotrochanters* are short pieces connecting the coxa and femur, but the *metatrochanters* form a larger supporting piece, which is sometimes considerably developed, *e. g.*, in *Sphodrus indus*, Chaud., where it is half as long as the femur, and is produced into a long sharp spine at its distal extremity.

The *femora*, and especially the profemora, are often dilated at the middle, sometimes greatly so (*Clivina lobata*, Bon.); occasionally they are dentate (*Itamus dentatus*, Andr., *Pristonychus spinifer*, Schauf.). They are usually furnished with some longitudinal rows of fine bristles.

The *protibiæ* exhibit two principal forms, that in which the inner margin is entire (*e. g.*, CARABINI), and that in which it is emarginate (*e. g.*, NOTIOPHILINI), but in the former there is generally a groove beneath of greater or lesser extent near the apex (*e. g.*, NEBRIINI), so that the two forms are connected. Like the femora, the tibiæ are usually provided with longitudinal rows of short bristles, and in some groups they are longitudinally furrowed. In the SCARITINI the protibiæ are adapted for digging, *i. e.*, they are palmate or digitate, the apical digitation being sometimes greatly produced, and the outer margin denticulate; in this group, too, the mesotibiæ have one or two spurs on the outer margin toward the apex, and the metatibiæ occasionally bear a row of very long hairs (*Scarites nitens*, Andr.).

The position of the *tibial spurs* is in the protibiæ a character of high taxonomic value. Each tibia has two spurs, and in the two hind pairs of legs both are terminal. In the protibiæ there is a fixed inner spur which is always terminal, but the outer or variable spur changes its position in different groups, and is nearly always found at or near the base of the groove or emargination referred to above. Both spurs are truly terminal in the OZÆNINI, METRIINI, and TRACHYPACHINI, but the variable spur, though very near the apex, is a little removed from it in the CARABINI and NEBRIINI.

The *tarsi* have always five joints, numbered from 1, the basal, to 5, the apical or claw joint; in form the joints are commonly quadrate or triangular, and joints 1 and 5 are usually the longest. The upper surface is generally glabrous, but sometimes pubescent, and there are, as a rule, some hairs at least at the apex, at the sides, and on the under surface. In the male from 1 to 4 joints are frequently dilated, a character to which further consideration is given under "Sexual dimorphism." The upper surface is occasionally sulcate or carinate (e. g., *Colpodes*), and joint 4 is sometimes emarginate or even bilobed (e. g., *Orthogonius*, *Colpodes*). Joint 5 bears two claws, often smooth, but sometimes dentate (e. g., *Metabletus*), or pectinate (e. g., *Calleida*): it is sometimes setiferous beneath, sometimes glabrous.

The *genitalia* of the male, and more particularly the highly chitinized sheath of the ædeagus, have in some families, such as the LAMELLICORNIA and CURCULIONIDÆ, proved of considerable assistance in distinguishing closely allied species. The variability of this organ, and consequently its use for purposes

of classification, appears to be much less in the CARABIDÆ than in the families referred to, and in this volume little use has been made of it. In *Siagona*, however, it exhibits considerable differences of structure, and these are shown in the diagram which will be found under that genus.

It is hoped that the "Keys" which will be found in the following pages will facilitate the discrimination of the various genera and species with a reasonable degree of certainty. Sometimes a character common to the great majority of the individuals forming a species may here and there be poorly developed, and, wherever it has seemed that doubt might arise, an effort has been made to utilize two or more characters, so that, if in any instance one of them breaks down, another may take its place.

Another point calling for notice is the spelling of generic names, which, in accordance with Article 15 of the Report of the British National Committee on Entomological Nomenclature (1925), is the original one. I concur entirely in this recommendation, as I can see no other way in which the spelling of generic names can be stabilized. In this volume only one change becomes necessary, the original spelling of the genus *Loricera* being substituted for that of *Lorocera*, a suggested emendation proposed by Bedel many years ago and now in general use.

Superficial Clothing.

The integument of the CARABIDÆ is as a rule smooth, more or less glabrous, and frequently shiny, though in such an immense family there are of course numerous exceptions. The hairs found on the body are of two kinds: (i.) the tactile or fixed setæ, or more simply "setæ," which are comparatively long hairs, presumably with a tactile function; (ii.) short hairs forming a pubescence.

The setæ are of very high taxonomic value and may be found on almost every part of the body; their remarkable constancy permits of their use for differentiating species, genera, or even groups. They are not referred to at length here, as they have already been dealt with in the various paragraphs under the heading "Structure of the Imago."

Pubescence may occur on some part of the body only, as, for example, on the venter (*Coryza*), or on the sternum (some species of *Catascopus*); but in other cases a more or less general pubescence may be characteristic of an entire genus (e. g., *Siagona*, *Apotomus*, *Ophonus*, etc.). There are few instances in this family of the pubescence on the upper surface forming a pattern, and the only groups known to me in which this occurs are the ANTHIINI and GRAPHIPTERINI.

Microsculpture.

An examination of the minute structure of the epidermis reveals a very varied form of microsculpture, which may often give considerable assistance in discriminating species. A fairly high magnification (about 75 diameters) is desirable for adequate observation, the surface to be examined must be thoroughly cleansed, and it is better seen under artificial light than by daylight. Sometimes the surface is quite smooth, but the microsculpture, when present, usually forms a reticulation composed of very fine lines, presenting various forms, which may conveniently be divided into four groups: (i.) *isodiametric*, when the meshes of the reticulation are approximately as long as wide; (ii.) *moderately transverse*, when the meshes are about twice as wide as long; (iii.) *strongly transverse*,

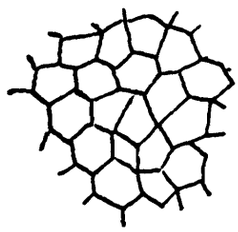


Fig. 4 *a*.
Tachys ornatus,
Apetz (head).

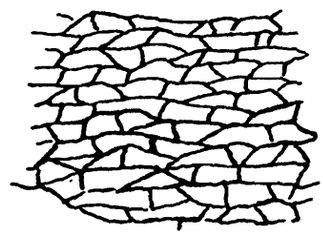


Fig. 4 *b*.
Tachys umbrosus,
Motch. (elytra).

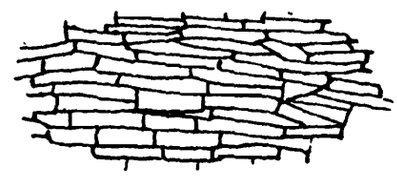


Fig. 4 *c*.
Tachys tropicus,
Nietn. (head).



Fig. 4 *d*.
Tachys euryodes,
Bates (prothorax).

when the meshes are four or five times as wide as long; (iv.) *striate*, when there is no reticulation and the microsculpture is formed by very fine, closely-placed, transverse lines or striæ. If the upper surface is considered as a whole, there is nearly always a lack of uniformity, and the same species may present one form on the head, another on the prothorax, and a third on the elytra; even on one part it may and frequently does disclose two distinct forms, one on the disk and another on the margins. The examples of these four types of microsculpture are taken from four fairly common Indian species of the genus *Tachys*.

Sexual Dimorphism.

In certain groups, and notably in the SCARITINI, there is usually, so far as I am aware, no external feature by which the sexes can be separated; but, as a rule, the male can be readily distinguished from the female by the dilated joints of the protarsi, which vary in number, commencing always with the basal joint. The number of dilated joints is constant for a species, but not necessarily so for a genus, and in *Carabus* and *Calosoma* the number may be three or four. In the HARPALINI there are normally four dilated joints, in the PTEROSTICHINI

three, in the TRECHINI two, in the BEMBIDIINI generally two, but sometimes only one. In some genera the joints of the mesotarsi are also dilated in the male, but not to the same extent as those of the protarsi, and only when the latter are also dilated. The vesture of these dilated joints on the underside is of a varied character, but two main forms may be distinguished: (i.) a clothing of scales, placed in two rows, as in *Harpalus*; (ii.) a dense pad of hairs, as in *Gnathaphanus*. These hairs have usually a long stalk and are dilated in various ways at the extremity; this subject has been dealt with and illustrated by G. Simmermacher (Zeitschr. für wissensch. Zool. xl, 1884, pp. 504–16, t. xxvi. ff. 22–30). As a rule the character of the vesture is constant throughout a group, but this is not invariably the case, and in the above example both genera belong to the HARPALINI; furthermore, in some groups genera occur in which in the male neither dilatation nor vesture is present. This tarsal character in the male was a good deal used in the classification of older authors, who formed groups called *Bipalmati*, *Tripalmati*, etc., according to the number of dilated joints; but, in spite of its apparent high taxonomic value, a character referring to one sex only is evidently unsuited to a scheme of classification comprising both sexes, and among modern authors it occupies only a subordinate place. It is a curious circumstance that in the Mediterranean species, *Gynandromorphus etruscus*, Quens., the first joint of the protarsi is widely dilated in the female.

Another difference in the sexes is sometimes shown in the form of the mandibles, which in the male may exhibit prominences and teeth, or may be liable to some form of distortion. In *Siagona* the mandibles are sometimes laterally dilated in the male, and at the same time they have carinate bosses on the upper surface near the base (*S. baconi*, Chaud., and *S. dilutipes*, Chaud.). In some species of *Oxylobus* the left mandible is dilated, and bent first upwards and then inwards, and at the same time on the upper surface the left side of the clypeus is produced and reflexed, while beneath the side of the mentum is bent downwards, so as to leave room for the mandible to function. This is the case in well-developed males of *O. asperulus*, Chaud., and gives the impression of marked distortion and asymmetry.

Certain sexual differences are also noteworthy in the apical ventral segment. Normally this bears on each side of its hind margin one seta in the male and two setæ in the female, but the number of setæ is very variable, and, though apparently holding good for each species, is not uniform within each genus. Sometimes each sex bears the same number, or both may be plurisetose (*Calosoma*), or glabrous (*Thlibops*), or the number may vary widely, as in the genus *Morionidius*, where

there is on each side a single seta in the male and half a dozen in the female. In some species of *Pterostichus* the last ventral segment in the male is foveate or tuberculate, sometimes even asymmetrical, as in the Japanese *P. asymmetricus*, Bates, but this character has not yet been noted in any of the few species of *Pterostichus* described from India.

Other differences sometimes seen in the male are the dilatation of some of the intermediate antennal joints (*e. g.*, in the palæarctic *Carabus ullrichi*, Germ.), or of the apical joint of the labial palpi (*Notiophilus*, *Cymindis*), the curvature of the tibiæ (*Calosoma*), and the pubescence on the metatibiæ (*Amara*). In the HARPALINI a difference in the character of the surface of the elytra is not uncommon, the male being shiny and the female dull.

Stridulation.

A stridulatory apparatus, so common a feature in some orders of insects and even in some families of Coleoptera, seems to be poorly developed in the CARABIDÆ; but, as these insects feed mainly at night and as such sounds as they produce are not likely to travel far, it can be only rarely that the evidences of stridulation are detected by human ears. Further, it often happens that the organs producing the sound are normally concealed from view, so that their discovery is likely to be a matter of accident. Hence it is hardly surprising that hitherto stridulating organs should have been found in only a few genera of this family, and, so far as the Indian region is concerned, in one genus only, namely *Siagona*, in which, however, it is highly developed.

In 1900 Dr. C. J. Gahan published a paper (Trans. Ent. Soc. Lond. pp. 433-52, t. 7. ff. 1–14) summarizing what was at that time known on the subject, and among CARABIDÆ he enumerates four genera, *Cychrus*, *Elaphrus*, *Blethisa*, and *Siagona*, as possessing the power of stridulation. With regard to *Cychrus* he mentions, but rejects, the discovery of Thos. Marshall (Ent. Mag. i, Lond. 1833, p. 213), since elaborated by other workers and quite recently by Dr. H. Roeschke in his Monograph of the CYCHRINI, in which group sound is produced by friction between the inner edge of the epipleura and the surface of the abdominal tergites. The genus *Cychrus* has not yet been found in our region, but, although in the very rare *Cychropsis sikkimensis*, Fairm., I was not able to find any apparatus developed, it is possible that it may be present. In *Elaphrus* and *Blethisa* the apparatus is similar, a row of minute tubercles being placed transversely on the penultimate tergite, and corresponding with a fine file on each side on the inner margin of the epipleuron.

But it is in *Siagona*, in our region, that these organs can be studied. Attention was first drawn to them by W G. Rosenhauer ('Die Thiere Andalusiens,' 1856, p. 26), who writes of *S. jenissoni*, Dej.: "the beetle, if held between the fingers, rubs the profemora against the prothorax, and thereby produces a creaking sound." Even now he would appear to be

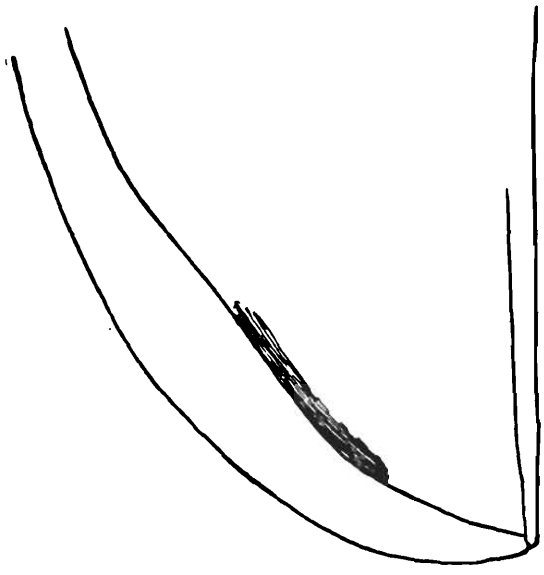


Fig. 5 *a*.—*Elaphrus riparius*, L. (ventral aspect of right elytron).

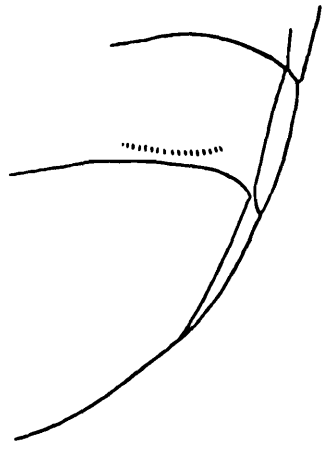


Fig. 5 *b*.—*Elaphrus riparius*, L. (dorsal aspect of abdomen)

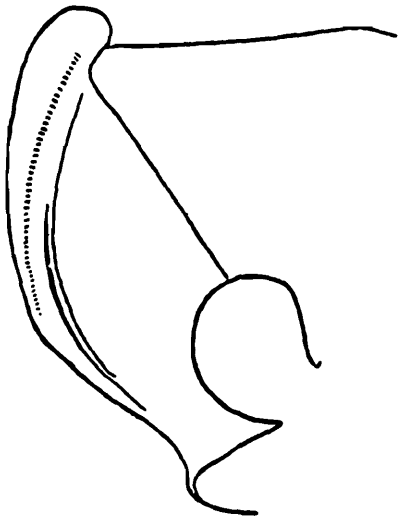


Fig. 5 *c*.—*Siagona angulifrons*, Bates (ventral aspect of prothorax (right side)).

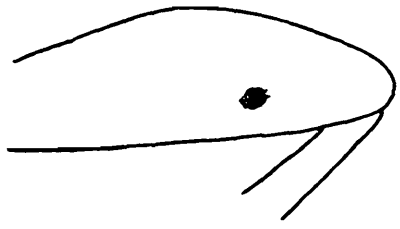


Fig. 5 *d*. *Siagona angulifrons*, Bates (dorsal aspect of right profemur).

the only person who has heard the apparatus in operation, and not then under natural conditions. L. Bedel and P. François have since described the organs of stridulation in some of the North African species. In India they are present in nearly half the species, but there is a curious lack of constancy, for they occur sometimes in both sexes, sometimes in the male only, and in at least two species they are sometimse

present, sometimes absent. Sound is produced in this genus by friction between a longitudinal row of minute tubercles on the propleuron and a small area like a file on the profemur. The accompanying illustration shows the two organs in *Siagona angulifrons*, Bates, and, as it is exceedingly likely that the genus *Elaphrus* will be discovered in the Himalayas, I have also figured the apparatus as developed in the palæarctic *E. riparius*, L. Some further observations will be found following the descriptions of the genera *Cychropsis*, *Paropisthius*, and *Siagona*.

In a comparatively recent paper on the subject (Ent. Blätt. 1921, pp. 145–55) Mr. E. Dudich enumerates the following genera of the CARABIDÆ, in some species of which an apparatus has been detected :—*Blethisa*, *Cychrus*, *Elaphrus*, *Graphipterus*, *Harpalus*, *Platyderus*, *Polyhirma*, *Scaphinotus*, *Siagona*, and *Sphæroderus*.

Wings.

The hind or membranous wings seem in the CARABIDÆ less likely than in some other families of Coleoptera to offer satisfactory characters for purposes of classification. Although in many genera fully-developed wings are present, in others the elytra are soldered together and the wings are reduced to mere rudiments, while in yet others there are both winged and apterous species. Nevertheless the wing-venation in this family, chiefly in regard to palæarctic species, has already been the subject of a number of memoirs, and as in my experience winged species are relatively more numerous in India than in Europe, they will no doubt offer a considerable field for future study.

There are in the Coleoptera two main types of wing—the ADEPHAGA-type and the POLYPHAGA-type, that of the CARABIDÆ belonging to the former. This is chiefly characterized by the presence of a closed cell known as the "oblongum," which is nearly always present, though occasionally wanting (*Dyschirius*, *Clivina*, *Calathus*), and illustrations are given here of the wings of two Indian species. In these the positions and names of the main veins are indicated, but there does not appear to be entire agreement regarding their homologies among those who have devoted most time to the subject.

The following works will be found useful for reference :—

(i.) "Notes pour la classification des coléoptères," by A. Lameere (Ann. Soc. Ent. Belg. 1900, pp. 355–76, and 1903, pp. 155–165).

(ii.) "Systematisch - Koleopterologische Studien," by L. Ganglbauer (Münch. Kol. Zeitschr. i, 1903, pp. 271–319).

(iii.) "The Wing Veins of Insects," by C. W Woodworth (University of California Publications, Technical Bulletins, Entomology, i, 1906, pp. 1–152).

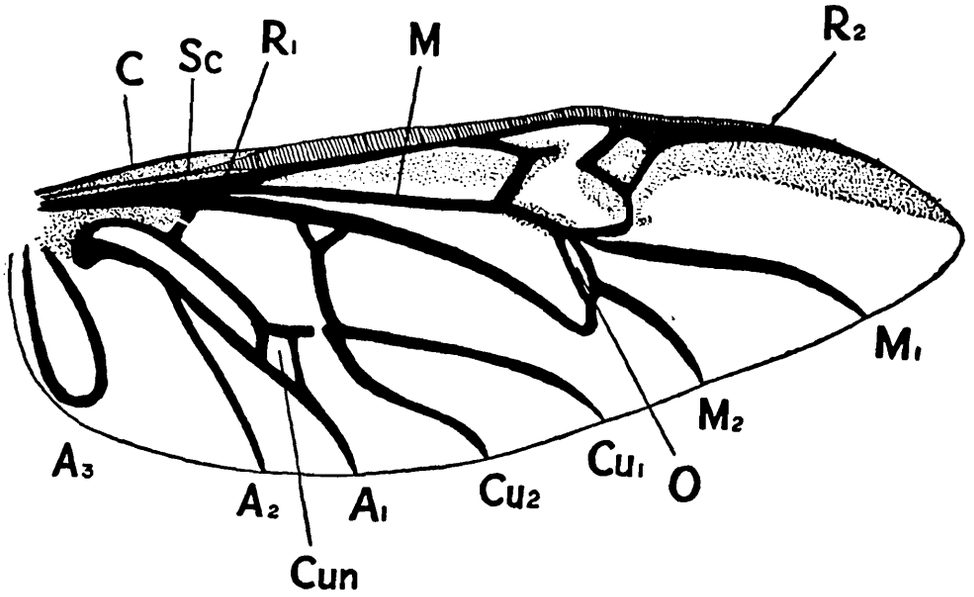


Fig. 6 *a*.—*Calosoma beesoni*, Andr. (hind wing).

(The names of the veins are as follows:—*C*., costa; *Sc*., subcosta; *R*., radius; *M*., media; *Cu*., cubitus; *A*., anal; *O*., oblongum; *Cun*., cuneus.)

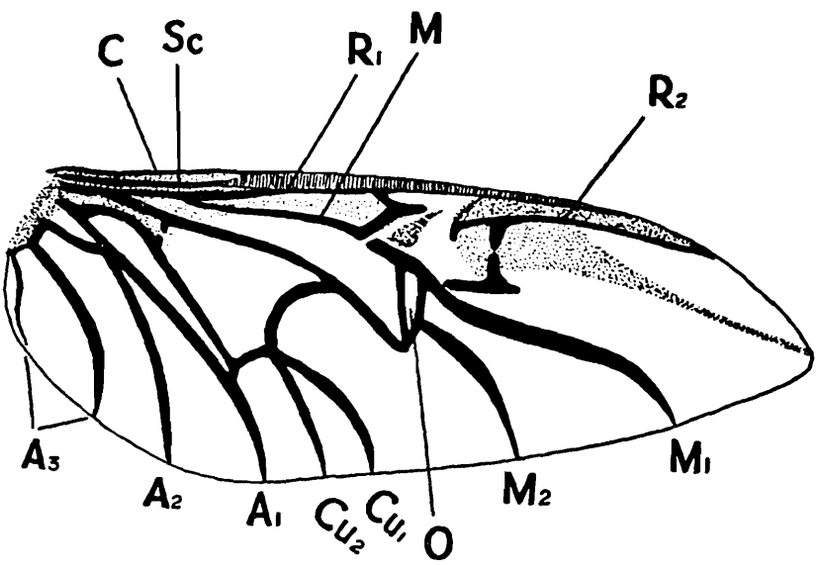


Fig. 6 *b*.—*Pheropsophus lissoderus*, Chaud. (hind wing).

(iv.) "The Wings of Insects," by J. H. Comstock, New York, 1918. (The section on the Coleoptera, pp. 297–300, does not refer specially to the CARABIDÆ.)

(v.) "La nervation alaire des Coléoptères," by A. d'Orchymont (Ann. Soc. Ent. France, 1920, pp. 1–50, tt. 1–3. ff. 1–18, and Ann. Soc. Ent. Belg. 1921, pp. 256–78).

(vi.) "Abbildungen von Flügelgeäder der Coleopteren," and "Das Flügelgeäder der Käfer," both by K. J. W. Bernet Kempers (Ent. Mitt. 1923, pp. 71–115, and 1924, pp. 45–63).

Mr. Woodworth's paper has been quoted by Fowler * on pp. 43–4 of his General Introduction, and several illustrations from the paper are reproduced, showing not only the venation of the wings, but also the way in which they are folded when at rest.

Biological Notes.

Examples of CARABIDÆ may be met with in India and the countries bordering it from coast-level up to as high a point as the base camp of the Mount Everest Expedition at 16,500 feet. Some genera, such as *Oxylobus*, are peculiar to the Indian continent and Ceylon, but many of those found in the plains of India are found elsewhere in South-East Asia, and most of the Himalayan genera occur also in the palæarctic region. Of three cosmopolitan species, carried by cargo-boats and usually met with at ports, two are known to occur in India, *Somotrichus unifasciatus*, Dej., having been met with in Ceylon, at Calcutta, and in the United and Central Provinces, while *Perigona nigriceps*, Dej., is fairly common throughout the region. Of species, many are peculiar to India and Ceylon, but a fair number, and especially those occurring in Burma, are found also throughout or in some part of continental South-East Asia, a few ranging even further to Japan, the Philippine Is., and the Malay Archipelago.

With regard to habitat, it may be said that, generally speaking, these insects probably seek the nearest stone, log of wood, moss, etc., for shelter during the hours of daylight. It is quite common also to find specimens under bark, but here the suitability of the shelter is likely to be of more importance than the species of the tree, though a relationship between them will, of course, exist when the prey of the beetle feeds on the wood of the tree. *Catascopus* has already been mentioned as a genus the members of which specially affect this form of retreat, and *Calleida* is another one, while Bouchard says that his *Clivina lignicola* is found in Sumatra exclusively under the decayed bark of felled trees lying on the ground. Of the species of the genus *Mormolyce*, with their remarkable leaf-like elytral expansions, Henri Deyrolle writes: "Mr. de Castelnau, who took a considerable number of specimens of the three known species, always found them underneath the trunks of immense felled trees near swamps,

* Fowler has made two unfortunate mistakes, for he not only quotes the author's name as "Woolworth," but also refers to his paper as appearing in the "University of Canada Publications."

but never when the ground was sodden. None was found in the open air, either by day or night they found the *Mormolyce* quite underneath, completely flattened out between the trunk and the earth, and he was never able to discover how they got there " (Ann. Soc. Ent. Fr. 1862, p. 316).

Other species, especially those of the genus *Colpodes*, live on the foliage of trees. I have taken specimens of *C. ruficeps*, Macl., in the Belgaum district when beating shrubs, and Mr. H. L. Andrewes has taken them in the same way in the Nilgiri Hills. Bouchard, writing on *C. rufitarsis*, Chaud., of which he took examples in Sumatra, says: "They are especially fond of the tops of the highest trees, and can only be taken in any number when these trees are cut down." Mr. H. G. Champion has captured specimens of *C. semistriatus*, Chaud., in Kumaon on *Quercus dilatata*, Lindl. Examples of three different genera have been discovered in India on fungus, viz.: *Tachys* and *Calathus*, one species each, and *Coptodera* three species, viz.: *C. eluta*, Andr., *C. interrupta*, Schm.-Goeb., and *C. transversa*, Schm.-Goeb.; probably, though there is no evidence of this, they were feeding on the larvæ of EROTYLIDÆ, ENDOMYCHIDÆ, or other fungus eaters, and in the case of *Coptodera* this may be the normal mode of life. The cosmopolitan *Perigona nigriceps*, Dej., seems to have a special affection for the decaying trunks of *Carica papaya*, L., for it has been found in them in three quite distinct localities, viz.: by Mr. C. Alluaud in Mauritius, by Mr. H. L. Andrewes in the Nilgiri Hills, and Mr. N. C. Chatterjee at Cuttack. *Hexagonia longithorax*, Wied., and *H. terminata*, Kirby, have both been met with under the leaf-stems of the plantain. *Metabletus fuscomaculatus*, Motch., and *Microlestes corticalis*, Duf., were taken by Dr. S. W Kemp on the Seistan Expedition (1918) " at base of desert plants."

Other members of the family prefer the vicinity of flowing or stagnant water, and the majority of species in the immense genera *Bembidion* and *Tachys* are found along the banks of streams and lakes, or at least in moist localities. Examples of the genus *Omophron* are generally met with in or on sand-banks adjoining water, and they appear to be semiaquatic in their habits; the life-histories of the Indian species are quite unknown, but Schiødte has figured the larva of the palæarctic *O. limbatus*, F., which, he tells us, recalls, owing to the great development of the prothorax, a young mole-cricket.

In palæarctic regions some of the species in certain groups, notably the TRECHINI, are cave-dwellers, and among them are some in which the eyes are rudimentary or even wanting altogether (e. g., *Anophthalmus*). Various species of this group have been discovered in the Himalayas, but none so far that are cavernicolous. An exploration of the Siju Cave in the

Garo Hills, Assam, by Dr. S. W Kemp and Mr. B. Chopra (1923), brought to light four species of CARABIDÆ; two of these had apparently no special connexion with the cave, but the other two, *Anchista binotata*, Nietn., and *Anaulacus fasciatus*, Schm.-Goeb., were both found "under stones in earth heavily manured with bat-guano." Examples of the latter species have since been taken by Mr. C. Dover, also in bat-guano in the Batu Caves (F.M.S.), and specimens of an allied species, *Caphora humilis*, Schm.-Goeb., were discovered by Dr. F H. Gravely at the Farm Caves, near Moulmein, "in depths of large dark cave." Both *Anaulacus* and *Caphora* belong to the MASOREINI, of which some species at least must definitely rank as cave frequenters.

With the exception of the Australian genus *Illaphanus*, unknown to me in nature, the CARABIDÆ do not, so far as I am aware, associate with ants, but there is abundant evidence of their association with termites. In Ceylon, an example of *Helluodes taprobanæ*, Westw., was found by Mr. G. M. Henry "in a termites' mound," and a specimen of *Luperca lævigata*, F., in the Pusa collection, was taken "in a termiterium." But it is the species of the genus *Orthogonius* which are known to prey upon termites, a subject upon which the writings of Father E. Wasmann should be consulted (*vide* Zool. Jahrb. Syst. xvii, 1902, pp. 142–5). *O. acutangulus*, Chaud., and *O. schaumi*, Chaud., are found in association with *Termes redemanni*, Wasm., *O. duplicatus*, Wied., with *Eutermes biformis*, Wasm., and *O. lucidus*, Bates, with *Odontotermes obesus*, Ramb. Mr. T. B. Fletcher writes in a letter to me: "The larvæ of *Orthogonius* are common objects in the [termites'] mounds, apparently living in little cells off the galleries, into which they can project their heads and grab the termites as these go by."

Instances of "swarming" in the CARABIDÆ seem to be very rare, but a passage in a letter from Mr. P. J. Barraud, of the Central Research Institute, Kasauli, to Dr. G. A. K. Marshall, on the subject of *Broscus punctatus*, Dej., is worth quoting. Mr. Barraud writes: "They caused a good deal of interest here owing to their extraordinary abundance at the end of March and in April. About sunset each evening they were in millions on the wing amongst and above the pine trees on the hills. They then formed a continual shower, which was most unpleasant, as they flew into one's face and down one's neck three or four at a time. Numerous birds, chiefly kites, were out, hawking for them. The swarms lasted for several weeks."

Among other miscellaneous notes on the habits of these insects, I may quote a passage in a letter from Mr. T. B. Fletcher in which he says of *Anthia sexguttata*, F: "They live in holes at

the base of trees and generally one sees just the tail end in the hole, with the two posterior spots—looking like some queer animal with large eyes—looking out." Regarding *Omphra atrata*, Klug, the late Dr. N. Annandale wrote me some years ago: "These beetles are extremely interesting because they were found apparently guarding their larvæ and eggs in a small burrow under a stone. They also, or possibly only the ♀, produce a dense smoke when irritated." J. Nietner wrote a long and somewhat diffuse account of *Cyclosomus flexuosus*, F., which he found in the cinnamon fields round Colombo; he says: "One would feel inclined to suspect them to be semiaquatic in nature, that is, that the insects to frequent the banks of rivers, or other damp places; and I know that some entomologists are under the impression that their mode of living is that of the genus *Omophron*. However, in my experience, the direct contrary is the case. They live in the driest, hottest, and sandiest places that can be found, where they burrow in the sand, exactly in the manner of the well-known genus of the *Amaras*" (Journ. As. Soc. Beng. 1857, ii, pp. 132 *et seqq.*, and Ann. Mag. Nat. Hist. (2) xx, 1857, pp. 272 *et seqq.*). For the habits of the species of the genus *Eustra*, see the description of that genus, after which are quoted Mr. George Lewis's observations on the Japanese species. *Anchomenus quadripunctatus*, Dej., has been met with by Mr. H. G. Champion in the Himalayas, but under what circumstances I do not know. The species is distributed throughout the palæarctic and nearctic regions, and the late Mr. G. C. Champion informed me that he took it plentifully in England in pine woods after a fire, but only in those circumstances. Sahlberg found it in Finland under somewhat similar conditions.

The CARABIDÆ do not normally feign death when disturbed, as happens in some other families of Coleoptera (*e.g.*, CURCULIONIDÆ), but trust to the rapidity of their movements to escape from their enemies. Other means of defence, however, sometimes exist, as in the BRACHININI and in the genus *Omphra*; these insects possess glands at the anal extremity from which they are able to discharge a fluid which volatilizes on contact with the air, and which possesses highly caustic properties. This emission is not only visible as a kind of smoke, but is apparently audible also, and no doubt it enables the insect to seek shelter while its enemy is recovering from the effects of the discharge. Mr. E. A. D'Abreu informs me that *Microcosmus flavopilosus*, Laf., when handled, gives out an odour like iodoform.

The colours of the CARABIDÆ are in general very sombre, and among the CARABINÆ the majority are black; in *Omophron*, however, there are various patterns of yellow and

green, the species of *Calosoma* are sometimes cupreous, or tinged with green or blue, those of *Nebria* have often a yellow border, and *Notiophilus*, *Paropisthius*, and many species of *Dyschirius* are of a brassy hue. In the HARPALINÆ the prevailing colour is also dark, but many exceptions occur, and in the vast number of genera vaguely aggregated under the group-name LEBIINI such instances are numerous, the brilliant blues and greens of *Catascopus* and the patterns of *Pericalus* being specially noticeable. In some genera there are often yellow spots on a dark ground (e. g., *Coptodera*, *Lioptera*), or there may be two yellow or orange fasciæ across the elytra (e. g., *Craspedophorus*), suggesting the wasp-type. Probably this form of coloration has some "warning" significance, as some of these insects have an undoubted resemblance to various evil-smelling ENDOMYCHIDÆ, but there seems, at all events in India, to be little direct evidence of their association. However, some measure of confirmation may be found in the suggestion previously made that various species of *Coptodera* may prey upon Endomychid larvæ. On the other hand, the effective contrast presented by the yellow and black colours of the species of *Pheropsophus*—one of the genera, too, which is specially armed with a defensive apparatus for the discharge of a caustic fluid—does not apparently render these insects immune from attack, for I learn from notes made by Mr. E. A. D'Abreu that examples of at least three species of this genus have been taken from the stomach of the Black Ibis. The upper surface in the genus *Tetragonoderus* presents a variegated pattern in brown and yellow, and I find a note of my own on *T. fimbriatus*, Bates, which runs as follows: "Taken in large numbers on a spit of sand in the Pandra River, near Ghozeh [Belgaum district], May, 1887. The species is very agile and difficult to catch, especially as its colour assimilates very closely with that of the dry sand in which it lives, and the numerous small stones under which it conceals itself." The curious little ant-like *Selina westermanni*, Motch., has been figured by Fowler on p. 58 of his General Introduction; regarding this species Dr. F. H. Gravely says in a letter: "Abundant under leaves on damp ground at the edge of the [Madras] Museum tank. It resembles an ant, but runs more rapidly and with a somewhat different gait." In the genus *Physodera* there are sometimes shining yellow areas at the sides of the prothorax, on the apex of the elytra, and on the apical ventral segment; these rather suggest the emission of light, but nothing appears to be recorded about them.

Although the immense majority of CARABIDÆ are undoubtedly carnivorous, some species do at times consume grain or other farinaceous matter, fruit, the pollen of flowers, etc.; this occurs

in certain palæarctic species of the genera *Harpalus*, *Zabrus*, *Pterostichus*, etc. The only note I can find on this subject regarding Indian species was made by Dr. S. W Kemp, who found an example of *Catascopus mirabilis*, Bates, in the Garo Hills " feeding at exuding sap."

Larvæ and Pupæ.

Among the Coleoptera there are two main types of larva—(i.) the campodeiform, (ii.) the eruciform. The former are active, with a more or less flattened body, well-developed legs,

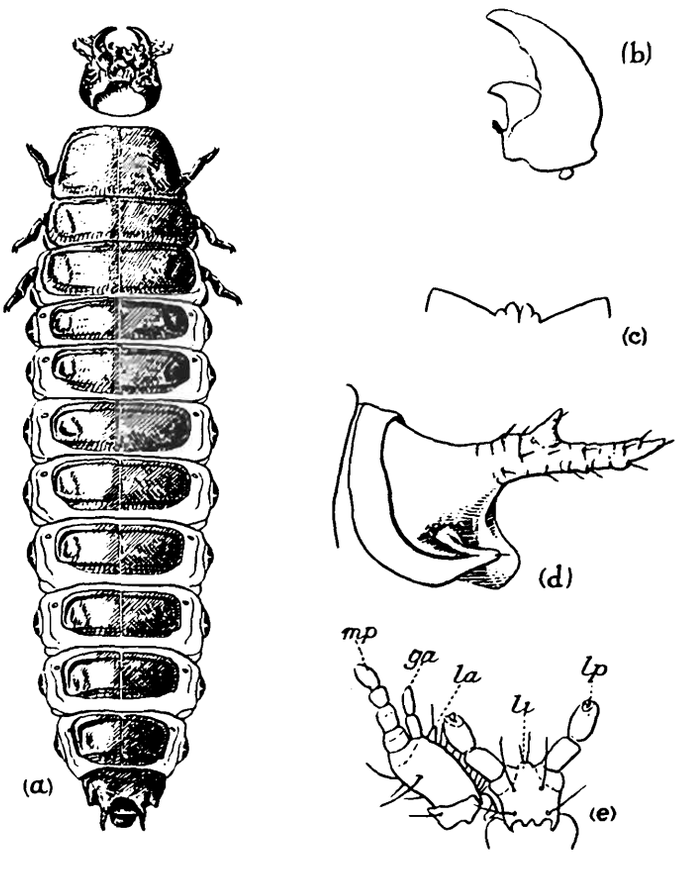


Fig. 7 A.—Larva of *Calosoma beesoni*, Andr. (After Gardner.)

(*a*) Dorsal view (the head has been detached). (*b*) Mandible. (*c*) Clypeus. (*d*) Lateral view of 9th tergite and one of the cerci. (*e*) Right maxilla and labium.

li., ligula ; *ga.*, galea ; *la.*, lacinia ; *m.p.*, maxillary palpus ; *l.p.*, labial palpus.

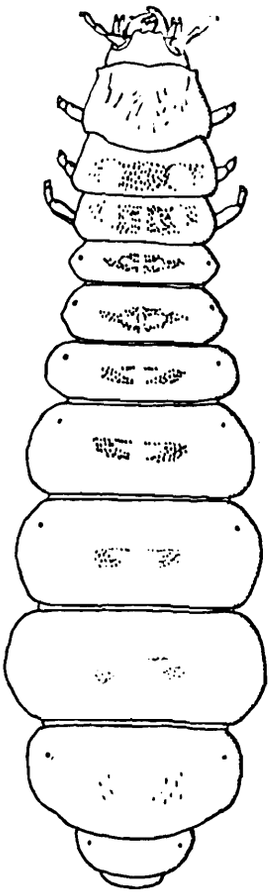


Fig. 7 B.—Larva of *Orthogonius duplicatus*, Wied.

and a chitinized integument ; the latter are relatively inactive, with a weaker, grub-like body, much less highly chitinized, the legs much less developed, or even, in the CURCULIONIDÆ,

wanting altogether. The larvæ of the CARABIDÆ conform chiefly to the campodeiform type, but there are exceptions (e. g., *Orthogonius*), and illustrations of both types are given here.

The classical work on Coleopterous larvæ is that of J. C. Schiødte 'De metamorphosi Eleutheratorum Observationes' (Nat. Tidsskrift, 1861–72); this deals almost exclusively with the larvæ of palæarctic species, but there is a short description of the larva of an unidentified species of *Scarites* from the Nicobar Islands, and an illustration of the larva of *Calosoma sericeum*, F (= *auropunctatum*, Herbst). About the same time, and under the name of *Acanthogenius piceus*, Schaum described and figured the larva of *Creagris labrosa*, Nietn. (Berl. Ent. Zeitschr. 1864, p. 116, t. 2, f. 6). In more modern times the following papers have appeared with figures and descriptions of the larvæ or pupæ of Indian species :—

(i.) A number of papers by Mr. G. de Lapouge (Bull. Soc. Sci. Méd. Ouest, 1905–8) are concerned with the description of the larvæ of a considerable number of species of *Calosoma* and *Carabus*. Most of these are palæarctic, but a few of them are Indian, and copies of the descriptions will be found in the appropriate place in the body of this work.

(ii.) Mr. T. B. Fletcher, in his "Second Hundred Notes" (Agr. Res. Inst. Pusa, Bull. 89, 1919, pp. 31–5) has described the larvæ of *Chlœnius bioculatus*, Chaud., *C. circumdatus*, Brullé, *C. pictus*, Chaud., and *Calosoma maderœ*, F., var. *indicum*, Hope, figuring those of the second and fourth of these species; the pupæ of these two were also figured, as was that of *Scarites indus*, Oliv.

(iii.) Mr. B. Chopra (Rec. Ind. Mus. xxvi, 1924, pp. 145–52) has given a detailed account of the larva of *Omphra atrata*, Klug *, with numerous figures.

(iv.) Dr. C. F. C. Beeson (Ind. For. li, 1925) has figured the larva of *Calosoma beesoni*, Andr.

(v.) Mr. J. C. M. Gardner (Ind. For. Rec., Ent. Series, xiii, 1927, pp. 63–7) describes, with illustrations, the larvæ of *Calosoma beesoni*, Andr., *Calleida splendidula*, F., var *rubricata*, Motch., and *Trichisia morio*, Laf.

Some account of the larvæ of a few palæarctic species may be given here, because most of the genera are represented by Indian species, upon whose metamorphoses light may be thrown by observations made elsewhere.

* When asked some years ago to name this species, I could only do so doubtfully, but I have now seen the type, and am able to confirm the identification.

In two papers (Bull. Nat. Hist. Lab., Iowa, 1893, p. 330, t. ix. ff. 1–2 and Canad. Entom. 1894, p. 39) Prof. H. F Wickham gives an account of his discovery of the larva of an American species of the genus *Brachinus* (*B. janthinipennis*, Dej.), which he found to be parasitic on the pupæ of the Gyrinid beetle *Dineutes assimilis*, Aubé. These pupæ were found in "mud cells on the lower surface of stones lying along" a river-bank. "Two of the *Dineutes* pupæ were each seen to be accompanied in their cells by a little white larva of rather robust form, evidently there with intent to do great bodily injury. The larva lies in the cell of its host and extracts the juices through an opening made in one of the wing-pads; the maggot-like body is adorned, but not supported, by six

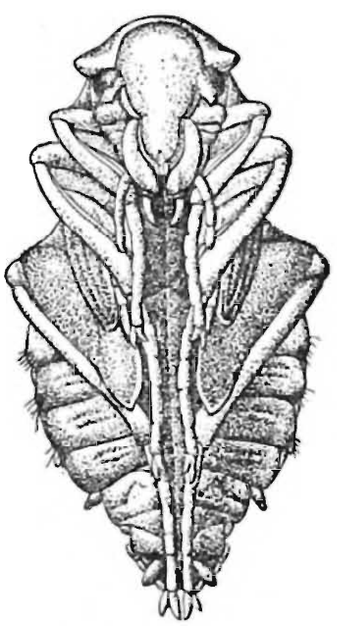


Fig. 8 *a*.
Calosoma maderæ, F., var. *indicum*, Hope.
Ventral aspect of pupa.
(After Fletcher.)

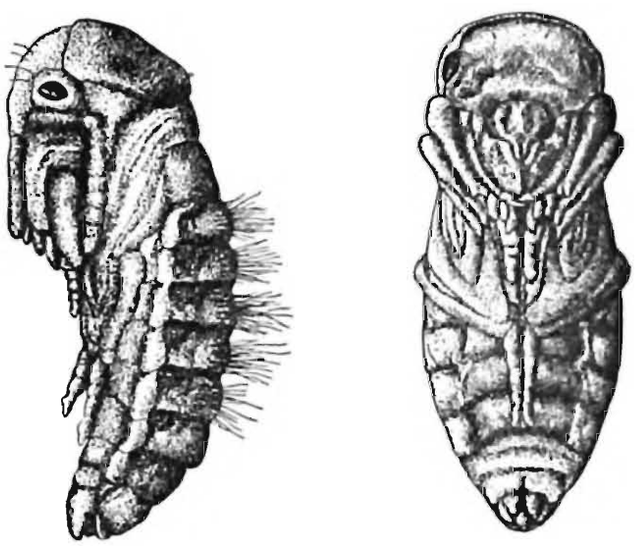


Fig. 8 *b*.
Scarites indus, Oliv.
Lateral and ventral aspects of pupa.
(After Fletcher.)

very soft and short legs, which can be of little service except perhaps as "feelers" in its dark abode. The mouth is filled with a blackish fluid when withdrawn from the feeding spot. If gently touched, the head and fore part of the body would be raised, as stiffly as consistent with such a soft insect, and this posture maintained for some moments. The little animals were carefully watched and examined several times a day, until, finally, the larger one, having withdrawn nearly all the juices from the pupa and become swollen to an unwieldy size, changed, after a day or two of resting, into a pupa—still in the original cell, which I had removed from a stone and turned upside down for more convenient examination.

. . . How the *Brachinus* gets into the cell of its host, whether brought as a young larva clinging to that of *Dineutes*, or deposited as an egg by the mother, is a mystery to me." These observations have since been confirmed by Messrs. Dimmock and Knab.

In the " Early Stages of Carabidæ," by G. Dimmock and F. Knab (Springfield Mus. Nat. Hist. Bull. i, 1904), the authors, after giving a short review of what was then known on the subject, describe and give illustrations of the larvæ of two American species, *Dicœlus purpuratus*, Bon., and *Brachinus janthinipennis*, Dej. I quote one interesting biological note. Writing of the two species in question the authors say: " The one, the predaceous larva of *Dicœlus*, is specialized and developed in a high degree; the other, the parasitic larva of the *Brachinus*, probably represents one of the most retrograde or degenerate forms of Carabid larvæ known. Of the beetles which these larvæ produce *Brachinus* seems more highly specialized than *Dicœlus*."

The biology of the large group of the LEBIINI is in India quite unknown, but attention may be drawn here to F Silvestri's long account of the remarkable metamorphoses of the palæarctic species *Lebia scapularis*, Fourcr. (Redia, ii, 1904, pp. 68–84, tt. 3–7. ff. 1–32), in which there are two larval and two pupal forms. The first larva is brownish in colour, active, with well-developed legs and antennæ, and it is during this stage that the insect feeds and develops. It then spins an oval silken cocoon, which serves to protect the second larva and pupæ. In the second larva, which is white, the antennæ and legs are very much reduced and the anal appendages have disappeared altogether. It remains to be discovered whether the same phenomena occur in the Indian species of this genus.

Mr. J. L. King, in his " Notes on the Biology of the Carabid genera *Brachynus*, *Galerita*, and *Chlœnius* " (Ann. Ent. Soc. Amer. xii, 1919, pp. 382–7, t. 30. ff. 1–4, and t. 31, ff. 1–4) has given an account of his discoveries regarding the deposition of eggs. Mr. King writes: " In a family of beetles so decidedly terrestrial in their habits we are indeed surprised to find that certain members deposit their eggs in delicate mud or clay cells high above the ground on the leaves of trees and shrubs. The form, size, and structure of the mud cells of these beetles seems to be distinct in each species, and this, together with decided variation in the immediate location or placement of the cells, renders specific identification possible for most of the species studied, with the exception of *Brachynus*.
the pellet of mud is collected by the beetle at and around the tip of the abdomen in such a way that the cell formed is in reality a mold of the caudal abdominal segments; the lid of the cell being formed from a thin layer of mud which covers

the dorsal portion of these segments. The writer believes that so far with all the known species of Carabidæ which deposit their eggs in earthen cells on plants, there is no correlation between the immediate location of the egg cells and the feeding habits of the issuing larvæ."

Dr. F van Emden has in recent years published two important papers: (i.) "Versuch einer Aufstellung von Gattungsbestimmungstabellen der Carabidenlarven" (Suppl. Ent. viii 1919, pp. 1–33), and (ii.) "Über Larvensystematik bei Insekten und Durchführung eines Systems bei Carabidenlarven" (Ent. Jahrbuch, 1923, pp. 101–14). The tables for the determination of larvæ comprise a large number of genera, many of them represented in India, but the early stages in so many Indian genera being at present unknown, these tables are necessarily far from comprehensive.

Economic Importance.

That the CARABIDÆ have a high economic importance can hardly be doubted, but its extent is difficult to assess. Practically all the insects comprised in the family are carnivorous, and, whether as larvæ or imagines, are usually night feeders, so that they rarely come under observation. Such memoranda on the subject as I have been able to accumulate are very scanty, and, so far as the present volume goes, relate exclusively to species of the genus *Calosoma*. In palæarctic regions *C. sycophanta*, L., and *C. inquisitor*, L., are both predaceous on the processionary caterpillar (*Cnethocampa processionea*, L.), and in India *C. beesoni*, Andr., *C. maderæ*, F., var. *indicum*, Hope, and *C. olivieri*, Dej., devour the larvæ of various Lepidoptera and Orthoptera. Such information as is available regarding these three will be found under the respective species*.

Some further observations have been published during the past few years by Mr. T. B. Fletcher, Dr. C. F C. Beeson, and Mr. J. C. M. Gardner, from which I make some quotations below :—

(i.) Mr. T. B. Fletcher, in his "Second Hundred Notes on Indian Insects" (Agric. Res. Inst. Pusa, Bull. 89, 1919, pp. 31–5, ff. 24 and 26), gives some particulars relating to three species of *Chlænius*, *Calosoma maderæ*, F., var. *indicum*, Hope (quoted under that species), and *Broscus punctatus*, Dej. In the case of the pests the name of the author has been added after the specific name.

(a) *Chlænius bioculatus*, Chaud.

"Several larvæ of *Chlænius bioculatus*, Chaud., were found at Pusa in July 1914, on sann-hemp plants, feeding on caterpillars of *Utetheisa pulchella*, L. The larvæ live

* See also a note under *C. himalayanum*, Gestro.

openly on the plants, walking briskly about and boldly seizing and devouring caterpillars much larger than themselves—their prey being usually caught by the ventral surface by passing the mandibles and head beneath it. Besides *Utetheisa pulchella*, various other caterpillars are eaten, and in confinement these larvæ and the adult beetles fed freely on caterpillars of *Prodenia litura*, F., *Polytela gloriosæ*, F., *Diacrisia obliqua*, Walk., and *Antigastra catalaunalis*, Dup., whilst the *Chlœnius* larvæ will also at times attack and devour one another, but the pupæ of the moths were not touched. *Utetheisa* larvæ were preferred. On an average each *Chlœnius* larva destroyed five, and each *Chlœnius* beetle seven caterpillars every two days."

(b) *Chlœnius circumdatus*, Brullé.

"A larva of *Chlœnius circumdatus*, Brullé, was found underground amongst sugar-cane roots at Pusa on 15th August, 1917 It pupated on 25th August and the adult beetle emerged on 29th August. It was found together with larvæ of *Monolepta signata*, Oliv., and of another unidentified Chrysomelid beetle (C. S. 1640) and is predaceous on these larvæ. In confinement it also ate grubs of *Stictaspis ceratitina*, Bezzi."

(c) *Chlœnius pictus*, Chaud.

"A larva of *Chlœnius pictus*, Chaud., was found in a parcel received from Cawnpore on the 11th July, 1915, and containing pieces of sugar-cane in which cane-borer larvæ were sent. It is probable that the *Chlœnius* grub was predaceous on the borer larvæ."

(d) *Broscus punctatus*, Dej.

"In February, 1914, adult beetles of *Broscus punctatus*, Dej., were found commonly at Pusa under the soil in grain fields infested with larvæ of *Agrotis ipsilon*, Hufn. Six beetles were collected on 26th February, 1914, and were kept under observation in the Insectary, and it was found that these beetles fed freely on larvæ of *Agrotis ipsilon*, *Prodenia litura*, F., *Pieris brassicæ*, L., and *Chilo simplex*, Butl. Under natural conditions of living in the soil, the beetles hunt for the caterpillars of *Agrotis ipsilon* beneath the surface of the soil, chase them to the surface, and there attack and devour their prey, whose internal parts are preferred, the skin being rejected as a rule. Pupæ of *Agrotis ipsilon* were not touched. The number of caterpillars destroyed daily by each beetle is comparatively small, one large *Agrotis* or two *Prodenia* larvæ sufficing as a rule, but on the other hand, the adult life

of the beetle is a long one, extending over at least three months, from March to June, so that each individual beetle ends its life with a considerable total destruction of caterpillars to its credit."

(ii.) Dr. C. F C. Beeson, in "The Deodar Defoliator" (Ind. For. li, 1925, pp. 565–72, t. 31. ff. 1–6), gives a detailed account of the ravages of a Geometrid moth (*Ectropis deodaræ*, Prout), which is preyed on by *Calosoma beesoni*, Andr. The paragraph dealing with the natural enemies of the pest will be found quoted after the description of *C. beesoni*.

(iii.) Mr. J. C. M. Gardner, in "Descriptions of Three Indian Beetle Larvæ (*Carabidæ* Col.)" (Ind. For. Rec., Ent. Series, xiii, 1927, pp. 63–7, t. 5. ff. 1–16), mentions the pests on which two of them are predaceous, viz., *Calosoma beesoni*, Andr., on *Ectropis deodaræ*, Prout (already referred to), and *Calleida splendidula*, F., var. *rubricata*, Motch., on *Pyrausta machœralis*, Walk., and *Hyblœa puera*, Cr. Nothing appears to be known of the biology of the third species, *Trichisia morio*, Laf.

In addition to the above, I have notes from the Pusa and Dehra Dun Institutes that *Parena nigrolineata*, Chaud., is predaceous on *Hyblœa puera*, Cr., and *Nephantis serinopa*, Meyr., and there is a further note on this species "grub predaceous on *Sylepta derogata*, F., parasitic grub." *Parena rubripicta*, Andr., is also predaceous on *Hyblœa puera*. From Mr. H. G. Champion I learn that he took *Catascopus hardwicki*, Kirby, "under the bark of *Holoptelea integrifolia*, Planch., infested with PLATYPODIDÆ," and this may give a clue to the habitual food of the various species of *Catascopus*, which are commonly found under bark. The species *Plochionus pallens*, F., with a world-wide distribution, has not yet been found in India, but is quite likely to be introduced; it has been found in stored rice in Java (Dr. Roepke), and in a rice-mill in Fiji (H. W Simmons), but, so far as I am aware, nothing is known of its life-history.

Geographical Distribution.

Regarded from a zoogeographical standpoint, India may be said to consist of three main divisions: (i.) the Himalayan tract, with the immense elevated plateau of Tibet to the north; (ii.) the plains which stretch across the country in the north, and are watered by the rivers descending from the Himalayas; and (iii.) the Deccan, or southern triangle, bounded roughly by the Vindhya Mountains and their offshoots in the north, and by the Eastern and Western Ghats. The elevation of the Deccan plateau averages about 2000 to 3000 feet, and it is only in the south that higher tracts occur,

namely, the Nilgiri, Palni, Shevaroy, and Anaimalai Hills, of which the first-named rise to nearly 9000 feet, while the highest peaks of Ceylon are only a little lower. Burma in the main is a very hilly country, but with some alluvial plains at the mouth of the Irawadi.

Generally speaking, it may be said that the Himalayas, with the Tibetan plateau, have formed a very effective barrier separating the palæarctic species of Central Asia from the subtropical species of India; at the eastern end this separation seems to be almost absolute, but in the west a few palæarctic species have penetrated from Turkestan to the Southern Himalayan slopes. Of genera inhabiting the Himalayas the majority are palæarctic, and only a few of these are sparsely represented in the plains; on the other hand, some subtropical genera are found at fairly high elevations in the Himalayas, but have not been able to push further north.

On the west other conditions prevail, where the deserts of Sind and Rajputana form the eastern extremity of the wide sandy belt of country stretching towards the west as far as Morocco. Some species have been met with at Karachi which are found also in Irak, in Egypt, or even in Western Africa, but this connexion seems to be a comparatively slight one. Although there are a few genera peculiar to Ceylon, the Carabid fauna of that island does not differ greatly from that of Southern India.

Since in 1846 Schmidt-Goebel described some ninety of the species of CARABIDÆ collected in Burma by J. W Helfer, only one important work on the fauna of that country has appeared. This was H. W Bates's 'List of the Carabidæ' taken during 1885–7 by that indefatigable collector Leonardo Fea, and from the Introduction to this work (Ann. Mus. Civ. Gen. xxxii, 1892) I give a few quotations: "It is perhaps too early to draw conclusions on the interesting subject of the relations of the Burmese Carabideous Fauna to those of other regions: for the number of species obtained by Signor Fea, large as it is [440], cannot be even an approximation to the total number inhabiting the country. This is shown by the fact that of the species enumerated by Schmidt-Goebel in his fragmentary 'Faunula Birmanica,' which contains a mere fraction of the genera of Carabidæ, no fewer than 43 were not met with by Signor Fea One or two obvious conclusions are, however, suggested by even a cursory glance at the present list. One is the close relationship between the Carabideous Fauna of the Irawadi Valley and that of Assam or the Valley of the Brahmaputra, showing that the mountainous region constituting the watershed of the Irawadi is not high enough to serve as a barrier to the migration of either terrestrial or arboreal species of the group, a conclusion confirmed by

the numerous cases in which the same species inhabit the Naga and Khasia Hills. A close faunistic relation exists also with the lower Gangetic Valley on the west and the great river basins of the Indo-Chinese countries to the east, as also with the lower valley of the Yangtsze Kiang, Eastern China, and Japan. Another conclusion is the lack of any striking speciality of the Burmese fauna in this family of Coleoptera."

It will be seen from the above general considerations that, whereas the Carabid fauna of Burma is fairly closely related to that of Assam, Eastern China, and even Japan, that of India is less closely connected with that of the surrounding countries. Nevertheless, apart from one or two cosmopolitan insects, there is a moderate proportion of species common to practically the whole of South-East Asia.

In addition to these generalities, it may perhaps be useful to put on record here a few notes on distribution, especially regarding the HARPALINÆ, which are not dealt with in this volume, but it is only intended as a modest survey of some of the principal genera of the groups found in the Indian region. Indeed it could hardly be more, for since the sixty-year-old 'Gemminger and Harold' was published, no general catalogue of the HARPALINÆ has been attempted, and an intensive study of the section 'CARABIDÆ' in the Zoological Record would have occupied far more time than I could devote to it.

The CARABINÆ being the subject of the present work, the range and habitat of the various genera, so far as known, are mentioned in the appropriate places. It may, however, be said of the two great genera *Carabus* and *Calosoma* that, while the species of the former are confined to temperate regions, and in India to the Himalayas, those of *Calosoma* seem able to adapt themselves to greater extremes of climate, and, in addition to those found along the Himalayan tract, one species, *C. orientale*, Hope, is met with in the plains. Of the other genera, *Paropisthius*, *Notiophilus*, *Nebria*, *Leïstus*, and *Loricera* are confined in India to the Himalayas, but, while the last four have numerous representatives in palæarctic and nearctic regions, *Paropisthius indicus*, Chaud, has only one near ally, viz.: *Opisthius richardsoni*, Kirby, found only in the Western States of North America. The three genera of the OZÆNINI, *Itamus*, *Eustra*, and *Anentmetus*, are all confined to South-East Asia, but the group is most highly developed in South America, with a few genera in Australia, Madagascar, and tropical Africa. In the SIAGONINI *Siagona* and *Luperca* are found in South-East Asia (chiefly India) and Africa, one species of the former genus being met with in nearly all the countries bordering the Mediterranean. The genus *Omophron* has a very wide range, but has not been

met with, I think, in either South America or Australia; in India the species are almost confined to the neighbourhood of the Himalayas, but one or two have been taken as far south as the Central Provinces. Among the SCARITINI *Gnaphon* is confined to India, *Oxylobus* to India and Ceylon, and *Coptolobus* is met with only in Ceylon.

In the subfamily HARPALINÆ, the HEXAGONIINI, GRANIGERINI, and DISPHÆRICINI are found in Africa and South-East Asia, and in the Indian region are represented by the genera from which they take their names. Of *Hexagonia* four species are known, of *Graniger* and *Disphœricus* three each; those of the last two are certainly insects of the plains, while those of the last are met with only in South India and Ceylon. The group PTEROSTICHINI is largely represented in palæarctic regions by the genus *Pterostichus*, with its enormous assemblage of species, but, while this is not wanting in India, there are but few species, all confined to the Himalayan tract. In South-East Asia three other large genera take its place, *Trigonotoma Lesticus*, and *Abacetus*, the last-named being also found in Africa, and with a single species in Southern Europe.

The BEMBIDIINI, with the principal and almost cosmopolitan genera *Bembidion* and *Tachys*, present some interesting features. *Bembidion* is essentially a genus of temperate regions, and is largely represented in the Himalayas; one or two rare species are, however, found in the plains, and also two more common ones belonging to the subgenus *Notaphocampa*, viz., *B. opulentum*, Nietn., widely spread in India and elsewhere in South-East Asia, and *B. niloticum*, Dej., which ranges from Egypt to Japan, but in India is met with in northern districts only. Nevertheless, species belonging to the more palæarctic subgenera are found further south where the elevation is sufficient, and I have in recent years described two, viz., *B. braminum*, found by Dr. S. W Kemp at 7000 feet in the Palni Hills, and *B. bryanti*, discovered by Mr. G. E. Bryant at 8460 feet in Java, in the crater of a volcano. Of the genus *Tachys* comparatively few species are met with in temperate regions, only about fifty being known from the whole of the palæarctic region, but in tropical and semitropical countries they are abundant, and in a recent memoir I was able to enumerate 165 species and varieties from South-East Asia, including a good many from India.

The BROSCINI, which reach their maximum development in Australia, are represented by only a few species in India, one of which, *Broscus punctatus*, Dej., originally described from Mount Sinai, ranges from Egypt across Irak and Northern India as far as Assam. In another genus, *Axonya*, the unique species, *A. championi*, Andr., is known only from the southern

slopes of the Himalayas. The IDIOMORPHINI group contains a single genus and species, *Idiomorphus guerini*, Chaud., a strangely aberrant and rare insect, confined to India, and found chiefly in the south. The genus *Apotomus*, the sole member of the APOTOMINI, is distributed in Southern Europe, Africa, Southern Asia, and Australia; the species are very few, and of the two found in India, one is fairly common throughout South-East Asia.

The HARPALINI are well represented in India, largely by such well-known palæarctic genera as *Harpalus*, *Hypolithus*, *Stenolophus*, and *Acupalpus*. Of these *Harpalus* is confined to the Himalayan tract, with the solitary exception of *H. advolans*, Nietn., a fairly common species in South India and Ceylon; but the other three are found chiefly in the plains, and *Stenolophus smaragdulus*, F., with its varieties, is one of the commonest species met with throughout South-East Asia, including the Malay Archipelago. Other genera, such as *Xenodus* and *Œsyperus*, are peculiar to India, a single species of *Acinopus* is an immigrant from the north-west, the few species of the genus *Barysomus* are shared by India and the Northern States of South America, while a good many Harpaline genera are spread over South-Eastern Asia, but do not occur elsewhere. The subgroup, of which *Anisodactylus* is the palæarctic representative, is replaced in South-East Asia by the genus *Gnathaphanus*; the species are few, but widely spread, and the individuals often very numerous. This genus is also met with in Australia, and one of the Australian species is found as far north as the Malay States.

Among the TRECHINI the palæarctic genera *Trechus* and *Perileptus* are both found in India, and nearly all the known species have been described during the last two or three years; with the exception of *Perileptus ceylonicus*, Nietn., all of them are confined to the Himalayan tract. In the POGONINI the genus *Pogonus*, fairly common in temperate climes, is represented in India by a single species, found in the plains, though a second species occurs in Baluchistan and Persia, but the genus *Lissopogonus*, with a single species, is met with only in the Himalayas.

There are quite a dozen genera in the great ANCHOMENINI group, which are found either in India or Burma, and of these at least four, *Anchomenus*, *Calathus*, *Pristonychus*, and *Sphodrus* are common in Europe. All of these, except *Anchomenus*, of which a few species occur in the plains and in Ceylon, are found only in the Himalayas; *Calathus* and *Pristonychus* are poorly represented in species, though *Calathus kollari*, Putz., is an excessively common insect throughout the Himalayas, while *Sphodrus* has but a single, rather rare species. Of the rest some frequent the hills and some the plains, but by far the

commonest is *Colpodes*, which frequents both, and is at least in part arboreal in its habits. This immense genus is spread all over South-East Asia, Central and South America, Madagascar, and Polynesia ; two species are known in Australia, but none in Europe, and I think only one in Africa.

The small group of the MASOREINI is poor both in genera and species, but is widely spread in the Old World, and one species, *Masoreus orientalis*, Dej., is common to North Africa and India. *Perigona*, the only considerable genus of the PERIGONINI, has a world-wide distribution in warm countries ; there are numerous species in the East, but not very many have been met with in the Indian region. The ODACANTHINI are poorly represented in temperate climes, but more largely in South America, Africa, and Australia, while in South-East Asia, including the Malay region, they are often met with in large numbers. More than a dozen species of *Odacantha* occur in our region, and three of *Ophionea* ; the species of the latter genus are widely spread, and, where they occur, individuals are frequently very abundant. Among the BRACHININI the genus *Brachinus* has numerous species in all the great continents, except Australia, and in our region thirty have already been described, nearly all of them peculiar to the region. *Pheropsophus* is found only in warm climates ; the species are fairly numerous in South America and Africa, while in South-East Asia both species and individuals are found in large numbers and often range over wide areas.

The group PANAGÆINI contains a number of genera, of which *Craspedophorus* is much the largest. This comprises a large number of species in Africa and Australia, and is also well represented both in India and Burma, where the species occupy peculiarly restricted areas. Excluding one from the "East Indies," there are fifteen at present described, of which two are peculiar to Ceylon, two to Ceylon and Southern India, four to Northern India, and five to Burma, while one is found throughout India, and the remaining species has a wider range, including Southern China, Indo-China, Siam, and Burma.

In the LICININI the chief genus is *Diplocheila*, found also in Africa and the United States, but attaining a high degree of development in India, Burma, and Indo-China. Of the large palæarctic genera *Licinus* and *Badister* one species only is known in each case, both being peculiar to the Indian continent. The OODINI are represented by the cosmopolitan genus *Oodes*, a single species of *Systolocranius* peculiar to Northern India, one or two species of *Simous*, and a few other small genera. Of the ten described species of *Oodes* seven have not been met with beyond the limits of the Indian region, but two extend their range through Indo-China to the Philippine Islands, and the few specimens of *O. virens* known to me were found in such

different regions as North India, Burma, Ceylon, Java, and the Philippine Islands.

Among the CHLÆNIINI we meet with some of the most brightly coloured of the CARABIDÆ. Of the brilliant little insects belonging to *Callistomimus*, a genus found also in South Africa, nearly twenty species occur in India and Burma, and are mostly peculiar to the region, two only, *C. chalcocephalus*, Wied., and *C. modestus*, Schaum, being found as far east as Hong Kong and as far south as Java. But *Chlænius*, a genus of world-wide distribution, contains probably more species than any other in the Indian region, and already some 120 have been described. A good many of these are known only from India or Burma, but this may be due to the fact that in some cases only one or two specimens have yet been discovered. Many of the common species have a wide range, *C. tenuelimbatus*, Ball., being found both in the Himalayas and Central Asia, *C. nigricans*, Wied.,—common throughout India—occurring also in Japan, Formosa, Indo-China, Java, and Sumatra, *C. hamifer*, Chaud., with an even wider distribution, being met with as far south as Queensland, while *C. spoliatus*, Rossi, of which specimens have been taken in Baluchistan, but not in India, ranges from Morocco, through Southern Europe and Central Asia, to Japan.

The TETRAGONODERINI comprise two genera well known in India. Of these *Tetragonoderus* is found in all continents except Australia; the fairly numerous species occurring in the Indian region are nearly all confined to it, though the Burmese *T. rhombophorus*, Schm.-Goeb., is also found in Laos, and *T. arcuatus*, Dej., is met with from Egypt to Laos. Of the singular genus *Cyclosomus*, with its oval form reminiscent of *Omophron*, comparatively few species are known, distributed through South-East Asia and Africa; three of them are known in our region, but only one of the three is peculiar to India and Ceylon.

Turning to the LEBIINI, we find that Lacordaire, in his 'Genres des Coléoptères,' had a group "Lebiides," containing 51 genera, of which he writes: "These genera, with a few exceptions, may be grouped fairly naturally round three types well known to entomologists, *Cymindis*, *Dromius*, and *Lebia*, and accordingly it would appear that the tribe is divisible into three, but, after many efforts, I have found it impossible to discover characters enabling me to attain this result." He therefore presents three keys grouped round these three genera. G. H. Horn, nearly thirty years later, writes: "After having given the tribe a careful study I have found myself with the same result as that arrived at by Lacordaire and Leconte, namely that it is not possible to divide the tribe in any satisfactory manner," but he gives a key to the genera

found in North America. In 1923 Mr. Sloane wrote: "Until all those Carabidæ which Horn grouped together in his tribe Lebiini are more thoroughly understood, the status of existing groups, and others which may be required, will be obscure." Chaudoir wrote separate Monographs on the *Thyreopterides*, *Coptoderides*, the genus *Cymindis*, the aberrant genera of the *Cymindis* group, the *Callidides*, and the *Lebiides*; he refers also to a group *Dromiides*, but did not monograph it. In these circumstances it will be seen that much remains to be done to create order in this at present somewhat chaotic assemblage of genera, and it is only possible here to give one or two general indications as to their distribution. Of the twelve genera enumerated in Ganglbauer's 'Fauna von Mitteleuropa' ten are found in India, but the number both of genera and species is far greater in warm than in temperate climes, and already over forty genera have been described from the Indian region. Of these ten are also found in North America, twelve in South Africa, but only four or five in Australia.

The curious little insects comprised in *Pentagonica*, the only genus in the PENTAGONICINI, are met with all over the world. Of the six found in our region, one is confined to Ceylon, but the others are widely distributed through the Malay region and Indo-China. The PHYSOCROTAPHINI occur, I think, only in South-East Asia and Northern Australia, and certainly one of the three genera in the group, *Physocrotaphus*, is confined to Ceylon. *Pogonoglossus*, however, has a wider range; two species have been described from Burma, two from Northern Australia, and ten others from Sumatra, New Guinea, etc. Species of this genus also occur both in India and Ceylon, but none has yet been described.

Of the HELLUONINI twelve genera are found in Australia, four in Asia, four in Africa, and two in America; all of these are peculiar to those continents, except for the genus *Macrocheilus*, which has representatives both in Asia and Africa. Of the two principal Asiatic genera, *Omphra*, with half a dozen species, is confined to India and Ceylon, and of the nine described species of *Macrocheilus*, three are confined to India, one each to Burma, Sumatra, and Java, the other three having a wider range, especially *M. trimaculatus*, Oliv., which is a very common insect throughout South-East Asia.

The ORTHOGONIINI contain one principal genus, *Orthogonius*, and two or three smaller ones. A few species of this genus are found in South Africa, and probably a larger number in tropical Africa, but otherwise it occurs only in South-East Asia, where both species and individuals are numerous. Chaudoir's Monograph on the group has hardly done more than touch the fringe of the subject, and in India alone only a small proportion of the species known to exist has been described. The distribution here will no doubt be found to

vary with that of the termite hosts; a few species, like *O. duplicatus*, Wied., and *O. alternans*, Wied., appear to have a fairly wide range, but much remains to be discovered about these interesting insects.

In the ZUPHIINI the genus *Zuphium* is practically cosmopolitan, and one species, *Z. olens*, Rossi, is met with from Western Europe to Indo-China; otherwise the dozen species of the Indian region appear to be rather local in their distribution.

In the DRYPTINI the three main genera are *Drypta*, *Desera*, and *Galerita*, which again are almost cosmopolitan, though the first two are not found in America (unless Chaudoir's *Drypta costigera* from Ega is, in fact, a *Drypta*), and the last is absent from Australia. The species of *Galerita* are numerous in tropical America and in tropical Africa, but comparatively few are met with in South-East Asia; most of the seven species known in our region have been found in North India and Burma. *Drypta* and *Desera*, on the other hand, seem in the Old World to be fairly abundant throughout the tropics, but very few are known either in Europe or Australia. In the Indian region some four species of *Desera* have been described and a dozen of *Drypta;* some of these, which do not appear to have any special predilection for either the hills or the plains, have been rarely met with, but *Drypta lineola*, Macl., and *Desera geniculata*, Klug, in one or other of their numerous forms, are among the very common insects of the East.

In the ANTHIINI we meet with some of the largest insects in the family; of the half dozen genera included in the group five are confined to the African continent, and in the case of *Anthia*, with its seventy species, only two or three are found elsewhere, namely, one in Arabia, one in Persia, and one, *A. sexguttata*, F., in India. This last species is common throughout the plains, but is not found either in Burma or Ceylon.

There remains one group, the PSEUDOMORPHINI, chiefly developed in Australia, but with one genus and half a dozen species in North America. One or two species, however, have been met with in the Malay region and as far north as the Malay Peninsula, so that some member of the group may yet be discovered in Southern Burma.

Classification.

The first important attempts to classify the CARABIDÆ were made early in the nineteenth century by Latreille and Bonelli, and particular mention must be made of the latter's wonderful 'Tableau Synoptique,' which was unfortunately unpublished, but will be found in the separate copies of his 'Observations Entomologiques.' On the works of these authors Dejean founded his classical 'Species général des Coléoptères' (1825-31), in which the family, with the addition of the CICINDELIDÆ, is divided into eight groups. Following

this came publications by Erichson and Redtenbacher, till in 1854 appeared the first volume of Lacordaire's 'Genera des Coléoptères,' a work which has proved in many families to be the foundation of the system of classification in use at the present day. In the case of the CARABIDÆ, however, later discoveries have rendered numerous changes necessary.

While Lacordaire's work was passing through the press Leconte published his 'Notes on the Classification of the Carabidæ of the United States,' in which he introduced a character not previously used, viz., the form of the epimera of the mesothorax; his system was elaborated by Schiødte and Schaum, to the former of whom is due the discovery regarding the position of the epimera of the mesosternum, which forms the basis of present day taxonomy in the family. In 1881 G. H. Horn published a monograph entitled 'On the Genera of Carabidæ with special reference to the Fauna of Boreal America,' the most considerable contribution till then to the classification of the family, and even now, nearly fifty years later, one of the most valuable studies which has ever appeared on the subject.

Many others, among whom may be mentioned Chaudoir, H. W Bates, Ganglbauer, Bedel, and Tchitcherin, together with numerous living authors, have added to our knowledge by the publication of memoirs either on special groups or on the fauna of special regions, but it was not until 1923 that any further important changes in the existing system were proposed. In that year Mr. T. G. Sloane, for many years an authority on the Australian fauna in this family, published his 'Classification of the Family Carabidæ,' in which a much higher taxonomic value is given to the form of the procoxal cavities than had been accorded to it by older authors. Mr. Sloane found by dissection that there were two forms of cavity, one with a single opening inwards, and another with two such openings. He writes: "The anterior opening is that through which the muscles and nerves of the leg pass into the prothorax; the posterior one has no apparent functional use." Although, for reasons given below, it has not been found possible to adopt in its original form the 'Table of Tribes' as set forth in Mr. Sloane's paper, his classification is of such importance that I reproduce it here; but the tribes not occurring in South-East Asia have been omitted, one new tribe, the IDIOMORPHINI, has been introduced, and a few verbal changes made. With the exception of the ELAPHRINI, HILETINI, PSEUDOMORPHINI, and MORMOLYCINI, the tribes included in the table are all represented in the Indian region, and, as genera belonging to three of these four tribes occur in adjoining territories, their discovery in future years either in the Himalayas or in Burma seems quite possible.

Table of Tribes.

	(22)	Mesocoxal cavities not entirely enclosed by the sterna; mesepimera attaining the coxæ	**Carabidæ disjunctæ.**
2	(13)	Procoxal cavities enclosed behind.	**Carabidæ clausæ.**
3	(12)	Prosternum with an intercoxal declivity and with a longitudinal intercoxal part to support the peduncle of the body.	
4	(5)	Protibiæ with both spurs terminal. Elytra with a process on each side	Ozænini.
5	(4)	Protibiæ emarginate, with the variable spur above the emargination.	
6	(7)	Upper articulation-point of mandible with head concealed by the clypeus.	Scaritini.
7	(6)	Upper articulation-point of mandible with head not concealed by the clypeus.	
8	(9)	Antennæ arising under a distinct lateral ridge. (Body pedunculate.)	Siagonini.
9	(8)	Antennæ free at base.	
10	(11)	Mandibles stout, a fixed seta in the scrobe. Antennæ not unusually setigerous	Elaphrini.
11	(10)	Mandibles flat, rounded externally, no fixed seta present. Antennæ with joints 2–6 bearing long setæ projecting irregularly forward	Loricerini.
12	(3)	Prosternum without an intercoxal declivity dividing coxæ behind; base of body supported by base of prosternum	Omophronini.
13	(2)	Procoxal cavities open behind .	**Carabidæ apertæ.**
14	(19)	Mandibles with a fixed seta in scrobe.	
15	(18)	Protibiæ obliquely grooved, variable spur near apex. Elytra with interval 2 not unusually wide.	
16	(17)	Head with two supraorbital setæ on each side. Elytra tessellated.	Opisthiini.
17	(16)	Head with one supraorbital seta on each side. Elytra not tessellated	Nebriini.
18	(15)	Protibiæ emarginate, variable spur distant from apex. Elytra abnormally sculptured, interval 2 forming a wide smooth space ..	Notiophilini.
19	(14)	Mandibles without a fixed seta in scrobe.	

20 (21) Head with one supraorbital seta; front not bisulcate; antennæ not received into a suborbital groove. Metepimera not perceptible . . . . . CARABINI.

21 (20) Head with two supraorbital setæ; front deeply bisulcate; antennæ received at base into a suborbital groove. Metepimera well developed. (Mandibles pluridentate.) . . . . . HILETINI.

22 (1) Mesocoxal cavities entirely enclosed by the sterna; mesepimera not attaining the coxæ. . . . .

Carabidæ conjunctæ.

23 (44) Procoxal cavities with a single opening inwards, the opening closed by the meeting of the epimeron with the intercoxal declivity. . . . . .

Carabidæ uniperforatæ.

24 (25) Maxillæ with a movable hook at apex . . . . . HEXAGONIINI.

25 (24) Maxillæ without a movable hook at apex.

26 (39) Elytra with a plica near sides on under surface.

27 (34) Elytra with edge of inflexed margin interrupted by the inner plica towards apex.

28 (29) Head with a suborbital longitudinal ridge . . . . . GRANIGERINI.

29 (28) Head without a suborbital ridge.

30 (33) Prothorax with posterior fixed seta, if present, at basal angle. Underside of ♂ protarsi, if not bare, having not more than joints 1–3 with vesture.

31 (32) Palpi not subulate PTEROSTICHINI.

32 (31) Palpi subulate . . . . . BEMBIDIINI.

33 (30) Prothorax with posterior fixed seta present, but distant from basal angle. Underside of ♂ protarsi having joints 1–4 spongiose beneath. (Body pedunculate.) DISPHÆRICINI.

34 (27) Elytra with inner plica not visibly interrupting margin towards apex. (Head normally with one supraorbital seta on each side.)

35 (38) Antennæ with at least joints 1–3 glabrous.

36 (37) Mandibles normal, with a fixed seta in scrobe . . . . BROSCINI.

37 (36) Mandibles thick and rugose; scrobes rudimentary, without seta. (Head deflexed. All tibiæ dilated outwardly at apex.). IDIOMORPHINI.

38 (35)	Antennæ with not more than joints 1 and 2 glabrous (rarely basal part of 3). Prothorax with posterior fixed seta wanting (except in *Gnathaphanus lævistriatus* Sturm.*). Head with one supraorbital seta on each side	HARPALINI.
39 (26)	Elytra without an inner plica.	
40 (41)	Mandibles with a fixed seta in scrobe.	TRECHINI (including POGONINI).
41 (40)	Mandibles without a fixed seta in scrobe.	
42 (43)	Prothorax wider than head, both normal	ANCHOMENINI (including MASOREINI and PERIGONINI).
43 (42)	Prothorax narrower than head, subcylindrical, the two connected by a narrow neck	ODACANTHINI.
44 (23)	Procoxal cavities with two openings inwards ..	**Carabidæ biperforatæ.**
45 (72)	Head without antennal grooves beneath.	
46 (49)	Mandibles with a fixed seta in the scrobe.	
47 (48)	Elytra truncate at apex. Prothorax bordered at sides, sutures of prosternum visible	BRACHININI.
48 (47)	Elytra entire at apex. Prothorax constricted to a narrow base; lateral borders and sutures not visible. (Body pedunculate. Maxillary palpi very long and narrow.)	APOTOMINI.
49 (46)	Mandibles without a fixed seta in the scrobe.	
50 (51)	Labrum with basal membrane exposed	LICININI.
51 (50)	Labrum with basal membrane concealed.	
52 (55)	Elytra with a plica near sides on under surface.	
53 (54)	Head with two supraorbital setæ on each side. Apical joint of maxillary palpi set obliquely on to penultimate . . .	PANAGÆINI.
54 (53)	Head with one supraorbital seta on each side. Apical joint of maxillary palpi set normally on to penultimate	CHLÆNIINI (including OODINI).
55 (52)	Elytra without an inner plica.	
56 (71)	Antennæ inserted just beneath the preocular frontal ridge.	
57 (68)	Antennæ with joint 1 normal.	

* A posterior fixed seta is present in the palæarctic genera *Trichocellus*, *Dichirotrichus*, and *Diachromus*.

58 (59)	Tibial spurs long, serrulate on lower edge of outer side	TETRAGONODERINI.
59 (58)	Tibial spurs short, not serrulate.	
60 (65)	Labium with paraglossæ adnate to ligula.	
61 (64)	Ligula narrow, paraglossæ always well developed.	
62 (63)	Mentum supported at base by a projecting submentum .. .	LEBIINI (sensu latissimo).
63 (62)	Mentum not supported at base by a projecting submentum .	PENTAGONICINI.
64 (61)	Ligula wide, corneous; paraglossæ normally rudimentary (in *Omphra* narrow and a little shorter than ligula) .. .	HELLUONINI.
65 (60)	Labium with paraglossæ free.	
66 (67)	Body pubescent. Eyes enclosed at base in large setose orbits	PHYSOCROTAPHINI.
67 (66)	Body glabrous. Eyes free at base	ORTHOGONIINI.
68 (57)	Antennæ with joint 1 scapiform.	
69 (70)	Labrum narrower than clypeus	ZUPHIINI.
70 (69)	Labrum wider than clypeus .	DRYPTINI.
71 (56)	Antennæ inserted far below the preocular ridge (on a level with lower side of eyes)	ANTHIINI.
72 (45)	Head with distinct, usually long, antennal grooves beneath	PSEUDOMORPHINI.

The tribe MORMOLYCINI (with the single genus *Mormolyce*) has been omitted from the table. In this genus the mesepimeron and metepisternum both reach the mesocoxal cavities, but in other respects it is not nearly allied to the "Carabidæ disjunctæ" and must be included among the "Carabidæ biperforatæ."

As the above system of classification depends in regard to one of its main divisions on a hidden character, which requires dissection for its observation, it hardly seems feasible to adopt it here. In the CARABINÆ, with which this volume deals, the uniperforate form of the procoxal cavities is always present, so that this question does not now arise; but Mr. Sloane has varied the generally accepted order of the groups, as he considers the closed procoxal cavities more primitive than the open ones. The evidence in favour of this seems very slight, and in the subjoined table I have reverted to the more usual order; otherwise the tribes are maintained as "groups," and I have followed G. H. Horn and Dr. H. Roeschke in regarding the Cychrini as a separate group.

The PSEUDOMORPHINI and MORMOLYCINI not being represented within our region, we shall have here to deal with two subfamilies only.

Family CARABIDÆ.

1 (2) Mesocoxal cavities not entirely closed by the sterna, the mesepimera reaching the coxæ . .. . Subfamily I. **Carabinæ.**

2 (1) Mesocoxal cavities entirely closed by the sterna, the mesepimera not reaching the coxæ. . Subfamily II. **Harpalinæ.**

Subfamily I. CARABINÆ.

It is difficult to estimate the proportion in which the two subfamilies are represented in the Indian region, but the HARPALINÆ are undoubtedly far more numerous than the CARABINÆ, and, taking into consideration the various factors available, the former probably outnumber the latter in species by at least five to one. None of the ten groups in the following table is peculiar to the region, and most of them contain palæarctic rather than tropical genera; indeed, the species comprised in six of the groups are practically confined to the Himalayan tract. Two of the groups contain each a single species, and three others are represented in each case by two or three species only; in the OMOPHRONINI and SIAGONINI, on the other hand, the species are quite as numerous as in any part of the world, and the space devoted here to the SCARITINI, a group which is well developed in nearly all the warmer parts of the globe, occupies half the volume. By some authors the OMOPHRONINI have been excluded from the CARABIDÆ and treated as a separate family leading to the HALIPLIDÆ, but I have followed Ganglbauer and Sloane, and include them here.

The character on which the two subfamilies are divided is apparently constant, and its discovery furnished the means for one of the greatest advances yet made in the classification of the family.

Key to the Groups.

1 (10) Procoxal cavities open behind, mesosternum longitudinally carinate in front.

2 (5) Mandibles without seta in the scrobe, head with one supraorbital seta on each side, protibiæ not inwardly emarginate, the variable spur placed a little behind the fixed one.

3 (4) Metacoxæ contiguous, labrum emarginate, elytral epipleura not unusually developed .. .. **Carabini**, p. 48.

4 (3) Metacoxæ separated, labrum deeply cleft, elytral epipleura very wide, largely enveloping the hind body **Cychrini**, p. 99.

5 (2) Mandibles with a seta in the scrobe.

6 (9) Protibiæ obliquely grooved on the inner margin with the variable spur not far from apex, elytral interval 2 not unusually wide.

7 (8) Head with two supraorbital setæ on each side, elytra tessellated, not bordered at base . . . . . **Opisthiini**, p. 102.

8 (7) Head with one supraorbital seta on each side, elytra not tessellated, bordered at base . . . . . **Nebriini**, p. 106.

9 (6) Protibiæ inwardly emarginate, with the variable spur above the emargination, elytral interval 2 abnormally wide . . . . . **Notiophilini**, p. 135.

10 (1) Procoxal cavities closed behind, mesosternum not longitudinally carinate in front.

11 (12) Prosternum without intercoxal declivity, the prosternal process developed into a large plate, concealing the mesosternum, mandibles with a seta in the scrobe, outline of body more or less circular . . **Omophronini**, p. 139.

12 (11) Prosternum with an intercoxal declivity, mandibles without seta in the scrobe.

13 (14) Protibiæ with both spurs terminal, elytra with a process on each side behind . . . . . **Ozænini**, p. 162.

14 (13) Protibiæ emarginate, with the variable spur above the emargination, elytra without any process on each side behind.

15 (18) Articulation of mandible with head visible from above, protibiæ not digitate.

16 (17) Antennæ not arising on each side under a lateral plate, joints 2 to 6 abnormal and bearing long setæ, body not pedunculate or flat. . . . . **Loricerini**, p. 170.

17 (16) Antennæ arising on each side under a lateral plate, joints 2 to 6 normal, body pedunculate and flat . . . . . **Siagonini**, p. 173.

18 (15) Articulation of mandible with head concealed by the clypeus, protibiæ digitate, body pedunculate . . **Scaritini**, p. 208.

Group I. CARABINI.

The two genera *Carabus* and *Calosoma* are included in this group, both embracing numerous species, the former spread throughout the palæarctic and nearctic regions and in Chili, the latter with a world-wide distribution. The procoxal cavities are open behind and the protibiæ are entire, both spurs.

being terminal, the mesosternum is carinate in front, the metacoxæ contiguous, the mandibular scrobe without seta, the labrum broad and emarginate, the palpi generally stout, the apical joint often dilated, the labials with joint 2 either bi- or plurisetose, the elytra unbordered at base, the body sometimes winged, sometimes apterous.

Key to the Genera.

1 (1) Antennæ with joint 2 about a third as long as 3, the latter, and generally both of them, strongly compressed, mandibles usually striate on upper surface, toothed at base only. . . . . CALOSOMA, p. 49.

2 (1) Antennæ with joint 2 rarely less than half as long as 3, both of them nearly always cylindrical, mandibles smooth on upper surface, each with a tooth, generally bifid, at about middle. . CARABUS, p. 70.

Genus CALOSOMA.

Calosoma, Weber, Obs. Ent, i, 1801, p. 20; Fabricius, Syst. Eleuth. i, 1801, p. 211; Dejean, Spec. Gen. ii, 1826, p. 190; Lacordaire, Gen. Col. i, 1854, p. 58; Ganglbauer, Käf. Mitteleur. i, 1892, p. 33; Reitter, Best. Tab. eur. Col. xxxiv, Carabini, 1896, p. 46; Andrewes in Mission Babault Ind. Carab. 1924, p. 6; Breuning, Mon. der Gattung *Calosoma* (i.), Kol. Rundsch. 1927, p. 129.

Callitropa, Castrida, Charmosta, Caminara, Camedula, Campalita, Cosmoplata, Ctenosta, Callistrata, Callistriga, Calamata, Callipara, Calodrepa, all Motchulsky, Bull. Mosc. 1865, ii, pp. 300-310; Breuning, Mon. (i), pp. 144-146.

TYPE, *Calosoma sycophanta*, L. (Palæarctic region.)

Head rather wide, not contracted behind eyes, neck inflated; not constricted, gula usually with a single seta on each side, eyes prominent, distant from buccal fissure, with a single supraorbital seta; clypeus narrow, bisetose, the frontal foveæ extending along its sides to near front margin, clypeal suture behind very fine or obsolete; labrum short, rather wider than clypeus, deeply emarginate in front, plurisetose in middle, a single large setiferous pore on each side lobe; mandibles long and powerful, only slightly curved at apex, without seta in scrobe, a rather blunt double tooth near base, front half of upper surface with rather coarse, slightly oblique, cross-striation; ligula small, truncate or arcuate at apex and plurisetose, the two middle setæ longer than the others, paraglossæ narrow, adnate, finely setose, separated from ligula at apex by a slight emargination; mentum emarginate, with a short but sharp tooth in the sinus and usually a seta on each side of its base, lobes gently rounded and sometimes bordered at sides, epilobes well developed; maxillæ strong, densely fringed with hairs along inner margin and over the whole of

the rounded apex, just below apex on inner side a fine sharp glabrous tooth, at right angles to the limb ; palpi stout, slightly dilated at apex, maxillaries with joint 2 elongate, joints 3 and 4 either equal, or 3 longer than 4, labials with joint 2 elongate, plurisetose on inner margin ; antennæ pubescent from joint 5, 2 short, 3 very long, both compressed and with a sharp edge along hind margin of upper surface, 1 and 4 sometimes with a feeble edge.

Prothorax short, sides strongly rounded and more or less bordered, a seta at middle and generally another one rather before base, hind angles sometimes flattened, generally deflexed and produced a little way backwards. *Elytra* wide, without basal border, with well-marked shoulders, rounded behind in ♂, rather pointed in ♀, narrowly bordered, the border generally serrate behind shoulder, epipleuræ moderately broad at base, contracted soon after basal third, scutellary striole elongate, a very fine sutural stria generally present, including which, and a stria which originates in the marginal channel at a third from base, the elytra are normally 18-striate, intervals of about equal width, the three primary ones with a series of punctures, each puncture minutely tuberculate, generally three, sometimes five, intervals between the primary ones, marginal channel and apex minutely tuberculate. *Sternum* : prosternal process more or less bordered, produced over the mesosternum, which is hollowed in middle, and narrowly emarginate behind, metepisterna narrowed behind, generally a little longer than wide. *Venter* : segments 4 to 6 bordered, border not reaching sides, 1 to 3 more or less setose in middle, 4 and 5 generally with a single seta on each side of median line, apical segment (♂ ♀) plurisetose along apical margin. *Legs* powerful, protibiæ sulcate, meso- and metatibiæ often curved, protarsi ♂ with three or four (three in all Indian species) dilated joints, clothed beneath with a thick hairy pad, claws smooth.

Range. World-wide. The genus is rich in species at the present day, and is also a very old one, many species from tertiary times having been described by O. Heer (Ueber die fossilen Calosomen, 1860). Some species prey upon larvæ and ascend trees in pursuit of them ; others live in fields and sandy wastes.

The larvæ of some European species have been described and figured, that of *C. auropunctatum* by Schiødte (Nat. Tidsskr. 1867, p. 480, t. 16. ff. 15-18) ; the larva, including a diagram of the buccal organs, has been figured by Ganglbauer (Käf. Mitteleur. i, 1892, p. 26). Mr. Fletcher's 'Second Hundred Insects' contains notes on the life-history of *C. indicum*, which will be found under that species. Mr. Lapouge's descriptions of the larvæ of two or three Indian species have been reproduced, but there seems to be doubt about some of the identifications.

Key to the Species.

1	(4)	Maxillary palpi with joint 4 as long as 3, side border of prothorax not reaching base, sides of prosternal process not bordered to extremity, metepisterna barely longer than wide.	
2	(3)	Æneous black; prothorax coarsely punctate at middle of base and apex, elytra strongly imbricate, punctures on primary intervals as wide as the intervals, but not standing out at all distinctly, 7 or 8 in number	*beesoni*, Andr., p. 52.
3	(2)	Blue-black; prothorax nearly uniformly punctate, elytra rather faintly imbricate, punctures on primary intervals not quite as wide as intervals, standing out very distinctly, about a dozen in number	*himalayanum*, Gestro, [p. 55
4	(1)	Maxillary palpi with joint 4 shorter than 3, side border of prothorax reaching base, sides of prosternal process bordered to extremity, metepisterna evidently longer than wide.	
5	(16)	Gular setæ present, prothorax with its sides bisetose.	
6	(11)	Mesotibiæ strongly, metatibiæ moderately curved.	
7	(8)	Elytra with the surface clearly imbricate, the striæ fairly well defined	*maderæ*, F., var. *auropunc-*
8	(7)	Elytra with the surface more or less granulate or tuberculate.	[*tatum*, Herbst, p. 58.
9	(10)	Elytra with striæ present, the granules, at least to some extent, in rows . ..	*maderæ*, F., var. *kashmir-*
10	(9)	Elytral striæ absent, except sometimes close to base, surface irregularly granulate	[*ense*, Breun., p. 60. *maderæ*, F., var. *indicum*,
11	(6)	Mesotibiæ slightly curved, metatibiæ straight.	[Hope, p. 61.
12	(15)	Elytra less than four times as long as prothorax, three intervals present between the primary intervals.	
13	(14)	Elytral striæ and cross-striation fairly deep, so that the surface is very clearly imbricate	*imbricatum*, Klug, p. 63.
14	(13)	Elytral striæ and cross-striation rather faint, the surface vaguely imbricate and nearly even	*imbricatum*, Klug, var. *andrewesi*, Breun., p. 64.

15 (12) Elytra fully four times as long as prothorax, five intervals present between the primary intervals .. *olivieri*, Dej., p. 65.

16 (5) Gular setæ wanting, prothorax with the pore and seta at hind angle wanting, mesotibiæ strongly curved in both sexes *orientale*, Hope, p. 67.

1. Calosoma beesoni, *Andr.*

Calosoma beesoni, Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, p. 290; Beeson, Ind. For. 1925, p. 570, t. 31. ff. 1 & 6; Gardner, Ind. For. Rec. xiii, 1927, p. 63, t. 5. ff. 6–10 (larva); Breuning, Mon. (i), pp. 139, 147, and 175.

Colour black, dull above, shiny beneath: vertex and sides of head, sides of prothorax, elytra, and underside (except along median line) more or less æneous, punctures on primary intervals faint metallic green.

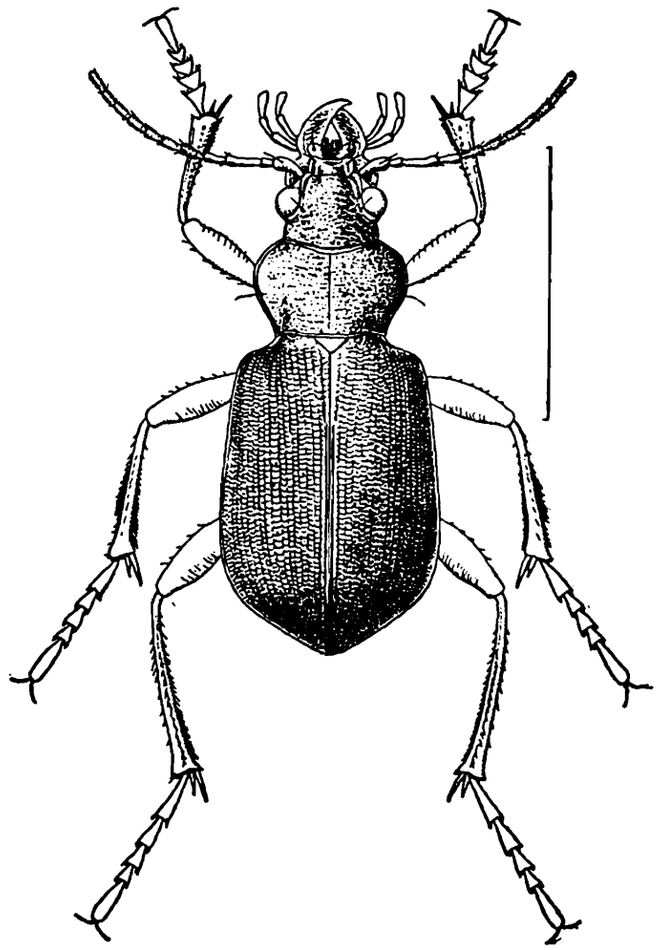


Fig. 9.—*Calosoma beesoni*, Andr., ♂.

Head flat, eyes projecting, clypeal suture obsolete, labrum uneven, substrigose, the whole surface closely punctate, more finely on neck, strigose near eyes, gula with a seta on each side, mandibles rather finely strigose-rugose, mentum with

lobes feebly punctate, its sides with only an indication of border, a seta on each side of tooth at base, maxillary palpi with joint 3=4, antennæ with joints 2 and 3 compressed and carinate, 1 slightly carinate *Prothorax* moderately convex, much wider than head, more than half as wide again as long, contracted slightly more in front than behind, base bordered at sides only, sinuate close to angles, apex truncate, with a thick border, sides rather strongly rounded, with a moderately thick border, which disappears quite close to base, where the sides are moderately sinuate, a seta at middle, none at hind angles, which, owing to the basal sinuation, project a little backwards; median line fine, basal foveæ small, but clearly marked, surface very closely punctate, coarsely along base and apex, densely and rugosely at sides. *Elytra* convex, shoulders well marked, widest at apical third and narrowing slightly towards base, not quite half as wide again as prothorax, half as long again as wide, sides with narrow reflexed border, very faintly serrate behind shoulders; the striæ very clearly punctate on disk near base, the punctures indistinct elsewhere, primary intervals each with a series of 7 or 8 umbilicate punctures, three intervals between the primaries, all narrow, convex, and imbricate, but on the first two or three near base the cross-lines are replaced by fine punctures, interval 6 usually wider towards apex, with the surface irregularly broken up. *Sternum*: the sterna coarsely punctate, except along median line, prosternal process bordered at sides, but not as far as extremity, metepisterna practically as wide as long. *Venter* uneven at sides, finely punctate, coarsely at sides of base, some faint longitudinal striæ at sides, 6 transversely striate. *Legs*: mesotibiæ slightly curved in ♂, densely clothed on inner and middle of outer surface with foxy hairs, metatibiæ ♂ and all tibiæ ♀ straight.

Length, 24–25 mm.; width, 10·5 mm.

UNITED PROVINCES: Mondali (type), Kathian, Molta, and Bodyar, all Jaunsar Himalayas, 7500–8000 ft. (*C. F C. Beeson*); Thano, Dehra Dun district, 4000 ft. PUNJAB: Simla division, Kalela Forest (all Forest Res. Inst.). N.W. HIMALAYAS (*E. P. Stebbing*).

Type in British Museum.

The specimen taken in the Kalela Forest was "found eating the deodar's defoliating caterpillar."

Mr. Gardner's account of the larva is as follows:—"Described from twelve larvæ collected at Deoban, 9000 ft., Chakrata, U.P., June 1923, C. F C. Beeson (Tube 774). This species is an important check on the Geometrid *Ectropis deodaræ*, Prout, and is referred to by Beeson in a biological paper on that species ('The Deodar Defoliator,' Indian Forester, li, 1925, p. 565).

"Form fairly stout, fusiform, slightly depressed. Head and tergal plates shining black; the lateral and ventral plates lighter in colour. Body hairs sparse, very short. Body length about 30 mm.

"Head (fig. 10) transverse, with curved sides, flattened above, the frontal sutures meeting just before the posterior emargination; the epicranial halves distinctly convex ventrally and meeting along the depressed median line; frons with a nearly circular, slightly raised discal zone; epistoma (fig. 7) widely emarginate with prominent lateral angles and two short, blunt, median teeth, each of which has a basal rounded protuberance on its outer side; hypostoma transverse, triangular. There are six ocelli on each side of the head. Antennæ with four distinct joints, of which the 2nd is the longest; the 3rd joint is clavate and is distinctly longer than the nearly parallel sided 4th joint.

"Mandibles (fig. 6) about twice as long as basal width, each with a stout curved tooth before the middle, and, before this tooth, a tuft of setæ. Maxillæ (fig. 8) with the cardo a short chitinised ring; stipes slightly widened distally, with numerous setæ on the inner half of the dorsal surface; galea with two nearly equal joints, the second joint fusiform; lacinia a distinct blunt tooth, which is about twice as long as wide and bears an apical seta; maxillary palp four-jointed, the first three joints short, the fourth about 1·5 times as long as wide. Labium (fig. 8) with the mental area fleshy; the stipites chitinised, with a pair of setæ near the middle; ligula a small blunt prominence with two adjacent setæ on the dorsal surface; labial palps stout, two-jointed, the second joint slightly the longer.

"The tergal plates of the body are transverse, each with a fine median line, glabrous except for a very few short lateral setæ; the pronotal plate is trapezoidal, about 1·5 times as wide as long; the subsequent tergites each with the anterior and lateral margins thickened; the fleshy dorso-lateral areas of the abdomen are not concealed when viewed from above; the 8th tergal plate with its posterior angles rounded, not produced; the 9th plate with its posterior angles shortly dentate and not concealed from above by the cerci. The cerci (fig. 9) are strong, rigid, and slightly divergent, with irregular surface; each with a short dorsal spine near the middle.

"Eusternum of prothorax a posteriorly curved castaneous plate. Abdominal sternites 1 to 7 each with a transversely oval plate bearing some very short setæ and with a transverse row of four small sternellar plates; the 8th and 9th sternites each with a single subrectangular plate. Epipleural plates of abdomen divided into a larger anterior portion and a small posterior one.

"Legs well developed, six-jointed, with two claws; the joints ventrally with numerous stout setæ.

"The anal tube is short, truncate conical."

With regard to the natural enemies of the Deodar Defoliator, Dr. C. F C. Beeson, in the paper quoted above, writes as follows :—" The defoliator is subject to a most efficient control by its parasites and predators; an increase in the numbers of the pest is followed in the next season by a proportional increase in the numbers of its enemies, which by the third season are able to suppress it. Of the predators the most important by far is a carabid beetle, *Calosoma beesoni*, Andr., which in the adult form (plate 31, fig. 1) eats the caterpillars, and as larva (plate 31, fig. 6) eats the pupæ in the humus. The chief hymenopterous parasite is a species of *Campoplegidea*. Tachinids are much less numerous. In a sample count made at Kathian in June 1923, the humus was found to contain 1600 carabid larvæ, 760 hymenopterous cocoons, and 80 tachinid puparia in association with 8000 pupæ dead and alive of the defoliator. Of the latter only 30 per cent. were living and this residue was presumably destroyed by carabids during the course of the rains and autumn. A sample count made during defoliation at Kowa, Tharoch, in May 1924, revealed beetles of *Calosoma beesoni* present at the rate of 3000 per acre. Scarcely a trace of the natural enemies was to be found in localities where defoliation was not in progress nor had occurred."

2. **Calosoma himalayanum**, *Gestro*.

Calosoma himalayanum, Gestro*, Ann. Mus. Civ. Gen. vii, 1875, p. 851; Breuning, Mon. (i), pp. 139 and 174.

Colour black, rather shiny: prothorax along margins, elytra along border to stria 15, bottom of striæ, punctures on primary intervals, epipleuræ, underside more or less, chiefly at sides, and labrum dark violet-blue.

Head flat, eyes only moderately convex, clypeal suture fine, labrum obliquely striate, the whole surface closely punctate, more coarsely behind, gula with a seta on each side (an example in my collection has four setæ on each side), mandibles finely and densely striate, punctate near apex, mentum without setæ at base of tooth, lobes punctate, unbordered at sides, epilobes rather wide, maxillary palpi with joint 3=4, antennæ with joints 1 to 4 carinate, 2 to 4 compressed. *Prothorax* moderately convex, much wider than head, half as wide again as long, contracted a little more in front than behind, base bisinuate, unbordered, apex bordered (but border sometimes obsolete in the middle), sides strongly rounded, with a thick, reflexed border, which disappears just before base, where

there is a slight sinuation in the sides, the flattened hind angles, owing to the sinuation at sides of base, projecting a little backwards, a seta on each side in middle, none at hind angles; median line very slight, basal foveæ rounded, not very deep, surface closely and a little confluently punctate, rather less closely on disk, but coarsely and rugosely along sides and base. *Elytra* ovate, convex, with well-marked shoulders, sides narrowing gently towards base, two-thirds as wide again as prothorax, and a little more than half as long again as wide, widest at about a third from apex, sides with a very narrow reflexed border, serrate behind shoulder; striæ punctate on disk near base, but finely crenulate elsewhere, primary intervals each with a series of about a dozen moderately large umbilicate punctures, generally a little narrower than the intervals, three intervals between the primaries, all narrow and convex, inner intervals nearly smooth, outer ones becoming finely imbricate, the two or three marginal ones and the extreme apex almost tuberculate. *Sternum*: sterna punctate, except middle of metasternum, prosternal process bordered at sides, but not as far as extremity, metepisterna practically as wide as long. *Venter* uneven at sides, finely punctate, coarsely at sides of base. *Legs*: mesotibiæ slightly curved in ♂, straight in ♀, both clothed on middle of outer surface with greyish-brown hairs, metatibiæ straight. The species is predaceous on *Lymantria obfuscata*, Walk., the defoliator of *Salix alba*, L.

Length, 28–31 mm.; width, 12–12·5 mm.

KASHMIR: Ladakh (type); Sindh Div., Manasbel Range, Haran plantation (*C. F. C. Beeson* and *B. M. Bhatia*). PUNJAB: Chamba (*C. Somers-Smith*): Khalatse, 4500 ft.; Bashahr, Poo.

Type in Genoa Museum.

[3. **Calosoma maderæ**, *F.*

Carabus maderæ, Fabricius *, Syst. Ent. 1775, p. 237.
Carabus indagator, Fabricius *, Mant. Ins. i. 1787, p. 197.
Calosoma maderæ, Dejean, Spec. Gen. v, 1831, p. 563; Mayet, Bull. Soc. Ent. Fr. 1887, p. 171 (larva); Ganglbauer, Käf. Mitteleur. i, 1892, p. 37; Bedel, Cat. rais. Col. Nord Afr. 1895, p. 20; Roeschke, Ent. Nachr. 1900, pp. 57 and 60; Lapouge, Bull. Soc. Sci. Méd. Ouest, 1908, p. 156 (larva): Andrewes, Trans. Ent. Soc. Lond. 1921, p. 153; Breuning, Mon. (i), pp. 140, 149, and 204.
Calosoma indagator, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 154; Breuning, Mon. (i), pp. 140 and 210.

The type-form of this widely distributed and very variable species has not hitherto been found within our limits, though it may possibly occur in Baluchistan. It was first described from Madeira, but occurs along both shores of the Mediterranean, and penetrates through Asia Minor and Syria to the

salt deserts of Southern Russia and Central Asia. It differs from *C. auropunctatum* only in its smoother, rather greasy appearance, the fine cross-lines on the elytra flattened down, the punctures on the primary intervals fewer and smaller, the prothorax more finely punctate, and the tibiæ less strongly curved. It is essentially a coast form, though occurring also in inland salt deserts. In India it is represented by three varieties or races, *C. auropunctatum*, *C. indicum*, and *C. kashmirense*, but these are merely extreme variations in particular directions, and many intermediate forms occur.

The type of *C. maderæ* is in the British Museum, that of *C. indagator* in the Copenhagen University Museum.

Although the typical form of this species does not occur in the Indian region, it seems desirable to place on record here a description of the larva, because three named varieties are found in the Himalayas, probably all of economic importance, and also because the short descriptions of the larvæ of two of these varieties are comparative only.

Mr. Lapouge's description of the larva of *C. maderæ* runs as follows :—" Parallel, five times as long as wide. Black, sometimes a little reddish brown. Head wide and short. Labrum somewhat shagreened, with subequal lobes. Outer angle of the external lobe advanced, directed a little outwards ; front face of the lobe very oblique, the sinus deep ; median lobe depressed in the form of a fold at middle, furnished with two strong triangular teeth, a little swollen and with a somewhat blurred outline, flanked outwardly by a minute tooth, indistinct under a lens, separated by a triangular emargination equal in size to one of the teeth. Disk vaguely rounded, very little swollen, embellished in front with two slight protuberances, and behind by a series of ill-defined striæ in the form of a fan. Supraocular tubercles conical, their apices directed backwards. Mandibles rather short. Antennæ short, a little shorter than the mandibles. Palpi very short, the joints hardly longer than wide. Mentum small. Ligula visible. Last joint of the labial palpi clavate and simple. Nototergites hardly trapezoidal, the pronotum long, almost square, the sides almost parallel, angles very little rounded in front, rather more behind. Pretergites not united to the subtegminal corneous patch. Tergites short, a little wider behind, allowing the white skin to be seen between the segments, even when the larva is not engaged in eating, marked on each half by a juxta-median muscular impression, and by another one which distorts the tegmen. Tegmina rudimentary, hardly projecting beyond the border in front, a little more behind, leaving the sides visible. Front angles widely rounded, sides a little arcuate ; decurrent lobes rudimentary, forming a border on a quarter of the semi-tergite, hardly projecting, and rounded on the front segments, a little more marked on the seventh

and eighth and about a fifth of their length, the angles less than right, sharp in the seventh, acutely pointed in the eighth. Telson small and short, very little emarginate, hind angles of 50°, produced and pointed. Hardly any trace of a supra-anal border. Cerci a third longer than the protelson, inserted high up, projecting from the base at an angle of 45°, rough, sharp, divergent, a little bent rather than arcuate near the spine, the upper internal spine short, conical, pointed, situated a good deal beyond the middle, the external one distant, represented by a feeble denticle, visible under the lens. Front median plates elliptic, four times as wide as high ; hind ones distant in the first segment, larger and less and less distant in the following ones, almost joining in the seventh, in the form of a parallelogram, wider than high ; lateral ones distant, oblique ; components of the first sub-pleural one distant, of the following ones united, of the pleural ones very near together ; puncta accessoria clear, numerous. Legs of moderate dimensions. Second instar, 25 by 5 mm. ; third instar, 33 by 7 mm. Two examples: Sfax, Gafsa, (*Mayet*). The example of the second instar has the disk of the telson orange, the cerci of the same colour, with their tips black.

"This larva represents almost exactly the mean among those at present known of the genus *Calosoma*. The characters of this group are the shortness of the appendages of the head, the mesolabrum with two large, widely separated teeth, each one accompanied by an external tooth, more or less developed according to the age and species, generally reduced to a projection, separated by a notch, the telson with its hind angles produced and pointed (except *calidum*), the cerci long, slender, very little arcuate, the outer spine rudimentary, the moderate development of the corneous plates, especially of those beneath, which are far apart. The tegmina and the decurrent lobes are generally rudimentary (exceptions : undetermined No. 5 and *Cal. scabrosum*).

"The larva of *Cal. maderæ* has already been described by Mayet from the same specimens."]

3 *a*. **Calosoma maderæ**, *F.*, var. **auropunctatum**, *Herbst*.

Carabus auropunctatus, Herbst in Arch. Ins.-gesch. (Fuessly), v, 1784, p. 131 ; Paykull, Mon. Carab. 1790, p. 68.

Carabus sericeus, Fabricius, Ent. Syst. i (1), 1792, p. 147.

Calosoma auropunctatum, Dejean, Spec. Gen. ii, 1826, p. 203; Dejean et Boisduval, Icon. et Hist. Nat. Col. Eur. ii, 1831, p. 51, t. 70. f. 4; Ganglbauer, Käf. Mitteleur. i, 1892, p. 36 ; Roeschke, Ent. Nachr. 1900, p. 60 ; Lapouge, Bull. Soc. Sci. Méd. Ouest, 1908, p. 158 (larva) ; Burgess & Collins in U.S. Dept. Agric. Bull. 417, 1917, p. 107 ; Andrewes in Mission Babault Ind. Carab. 1924, p. 6 ; id., Ann. Mag. Nat. Hist. (9) xix, 1927, p. 98 ; Breuning, Mon. (i), pp. 140 and 211.

Calosoma orientale, Bates * (not Hope), Scientific Results of Second Yarkand Mission, 1891, Col., p. 3.
Calosoma sericeum, Schiødte, Nat. Tidsskr. 1867, p. 480, t. 16. ff. 15–18 (larva); Bates, Entom. 1891, Suppl. p. 8; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 156.

Colour black, upper surface often with an æneous or cupreous tinge, the punctures on the primary intervals metallic green or cupreous; rather dull above, shiny beneath.

Head with eyes only moderately prominent, clypeal suture obsolete, vaguely striate near eyes and across vertex, neck rather finely punctate, gula and mentum with a seta on each side, mentum very faintly punctate, lobes feebly bordered, mandibles rather finely punctate-striate, maxillary palpi with joint 3 half as long again as 4, antennæ with joints 2 to 4 compressed, 1 to 4 carinate, 4 at base only. *Prothorax* much wider than head, more than half as wide again as long, a little more contracted behind than in front; base only slightly bisinuate, unbordered, apex emarginate, front and side borders rather fine (for the genus), side border reaching base, widened and rather reflexed behind, with two setæ, sides strongly rounded, without sinuation behind, hind angles deflexed, rounded, projecting very little backwards; surface finely punctate, more coarsely and confluently along base. *Elytra* about half as wide again as prothorax, two-thirds as long again as wide, very slightly serrate behind shoulder; striæ more or less well marked, the punctures in them clearly visible on scutellary region only, intervals nearly flat, three between the primaries, which have 8 to 12 punctures, the surface imbricate, with cross-lines, more or less flattened, but rather more roughly sculptured behind shoulder, marginal channel widely and apex finely tuberculate. *Sternum*: sterna punctate, smooth along median line, proepisterna nearly smooth on outer half, prosternal process with border reaching apex, metepisterna distinctly longer than wide, a slight channel along outer margin. *Venter*: the segments with one seta, but sometimes several, along each side of median line. *Legs*: meso- and metatibiæ strongly curved in ♂, slightly in ♀, a slight clothing of foxy hairs on outer margin of mesotibiæ.

Length, 18–30 mm.; width, 7–11 mm.

Northern and Central Europe. Central Asia. PUNJAB: Kulu (*Graham Young*); Lahul, Sumdeo, Patseo, Sisu, Keiling, Cimur, and Rotang Valley (all *G. Babault*); Chamba (*C. Somers-Smith*); Bannu (*Pennell*). KASHMIR: Sonemerg, 8600 ft. (*T. R. D. Bell*); Kogyar, Sindh Valley, Dras, Kargil, and Leh (*F Stoliczka*—Ind. Mus.). UNITED PROVINCES: Chakrata district, Konain, 8000 ft. (*S. N Chatterjee*—For. Res. Inst.).

Type lost; that of *sericeum* in the Kiel University Museum.

European examples are generally larger than Indian ones, viz., 22–30 mm., compared with 18–25 mm. The elytra in the latter are a little rougher, the striæ tend to disappear, and sometimes only those defining the primary intervals are actually visible.

Of the larva Mr. Lapouge writes :—" A little smaller, sensibly narrower, but otherwise differing from the larva of *maderæ* in the following particulars only. Outer denticle of the mesolabrum more distinct. Decurrent lobes a little less rudimentary, their sides and hind margin straighter, the angle less rounded ; telson with a smaller orange spot, only slightly contracted behind, the sides subparallel, the angles more produced. Cerci a little longer, the spine a little beyond the middle. Front median plates a little wider. Though these differences are too vague to be expressed in figures, they are quite recognisable when two specimens are placed side by side. Examples from Brittany, and the type of Schiφdte.

"The larva of *auropunctatum* has been well described and figured by Schiφdte, iii, 200-201, tab. xvi. 15-18, under the name of *sericeum*. That attributed by Lucas to this species belongs to *C. morbillosus*."

3 *b*. **Calosoma maderæ**, *F.*, var. **kashmirense**, *Breun.*

Calosoma maderæ kashmirense, Breuning*, Mon. (i), p. 216; (?) Lapouge, Bull Soc. Sci. Méd. Ouest, 1908, p. 158 (larva).

The somewhat unnecessary name of *kashmirense* has been in circulation for many years, but it is only quite recently that Dr. Breuning has described the form which passes current under it. The only recognizable difference between it and var. *indicum*, is that fine striæ are visible on the elytra and the scaling is more or less, though vaguely, defined, whereas in *indicum* the whole surface is finely and nearly uniformly granulate.

Length, 22–24 mm. ; width, 8·5–9 mm.

PUNJAB : Kulu ; Rotang Valley and Lahul, Sumdeo (*G. Babault*). KASHMIR. TIBET.

Type in Dr. Breuning's collection.

Mr. Lapouge writes regarding the larva :—" I received from Rost, as belonging to *auropunctatum* v. *kaschmirense*, two larvæ taken in Kashmir in 1905, and in Kulu, western Himalayas, in 1906, during the summer. This larva is narrower, the mesolabrum shorter, narrow, the median fold narrower, very concave, the teeth narrower, the denticle nearer, imperfectly separated, the decurrent lobes projecting a little, the angle sharper ; the telson is rectangular, without any orange spot, the angle a little produced, a little extroversed ; the cerci are a little longer. Third instar, 31 by 6 mm. Perhaps the larva of another *Calosoma*."

3 *c*. **Calosoma maderæ, *F.*, var. indicum, *Hope*.**

Calosoma indicum, Hope, Zool. Misc. 1831, p. 21; Roeschke, Ent. Nachr. 1900, p. 59; Fletcher, Second Hundred Notes on Indian Insects, Agr. Res. Inst. Pusa, Bull. 89, 1919, p. 33, f. 26; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 171; id., in Mission Babault Ind. Carab. 1924, p. 6; Gardner, Ind. For. Rec. xiii, 1927, p. 64, t. 5. f. 11; Breuning, Mon. (i), pp. 140 and 215.

Calosoma scabripenne, Chaudoir *, Ann. Soc. Ent. Fr. 1869, p. 371; Bates, Entom. 1891, Suppl. p. 8; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 145.

Calosoma maderæ nivale, Breuning, Mon. (i), pp. 140 and 216.

This form does not differ much from *auropunctatum*, but it is very variable in size and usually of a lighter cupreous tint. The striæ on the elytra have practically disappeared,

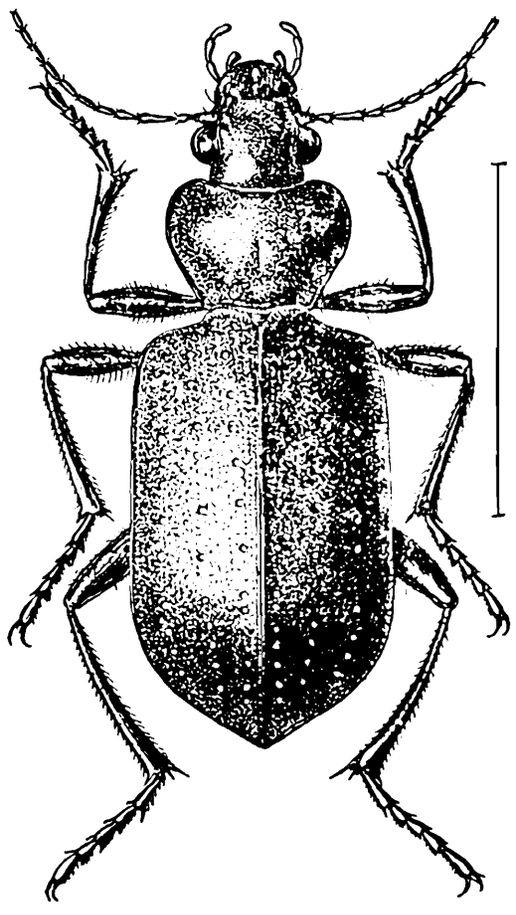


Fig. 10.—*Calosoma maderæ*, F., var. *indicum*, Hope, ♀.
(After Fletcher.)

and the imbrication is broken up into a fine, rugose, and nearly uniform granular surface, on which the gold-green punctures of the primary intervals generally stand out conspicuously, the sides beyond the third primary and the apical fourth of the elytra finely tuberculate. On some of the specimens examined the gula has two setæ on each side instead of one.

Length, 20–31 mm.; width, 7·5–12 mm.

NEPAL (*Hardwicke*—type). North India (*Dr. Bacon*). N.W. FRONT. PROV.: Peshawar, Taru, and Kohat (*Gen. T. B. Fletcher*—Pusa Coll.). PUNJAB: Bajaura, Kangra district, and Spiti, Tsho-ti (*G. Babault*); Kulu, Phulga. KASHMIR: Srinagar (*H. T. Pease*—Ind. Mus.). BENGAL: Calcutta (Ind. Mus.). BIHAR: Pusa, Chapra (*Mackenzie*). UNITED PROVINCES: Dehra Dun.

Type lost, that of *scabripenne* in Mr. René Oberthür's collection.

Mr. Fletcher's 'Second Hundred Notes' contains observations on the life-history of this insect, together with figures of larva, pupa, and imago. He writes: "In April 1916, larvæ and adults of *Calosoma indicum* Hope were commonly found at Peshawar in wheat and oat fields infested with caterpillars of *Cirphis unipuncta*, being found in cracks in the soil or under clods and shooks. Both larvæ and adults were found to feed freely on the *Cirphis* caterpillars. Of the larvæ brought to Pusa one pupated on 9th May and attained the adult stage on 13th May.

"In October 1917 many of the *Calosoma* grubs were found at Pusa in a field of *Phaseolus aconitifolius*, preying on caterpillars of *Plusia*, *Remigia*, and *Thermesia*. The grubs were active and bold, running briskly about and freely attacking the caterpillars. Fifteen grubs collected on 7th October were placed in a cage, and all went into the earth, but, on searching the cage a week later, only one grub was found alive, and it is evident that these larvæ are cannibalistic when confined in close quarters.

"The full-grown larva is flattened, about 30 mm. long and about 6 mm. broad, all the segments covered dorsally with a shining black plate, the lateral and ventral areas greyish and membranous, with black plates. Three pairs of well-developed legs are present. Anal segment with an anal tube, which helps in locomotion, and dorsally with a pair of low single-branched spines, posterior margins of segments produced externally into short spinous processes.

"The pupa is white and about 17 mm. long and about 7 mm. broad across the first abdominal segment, the head narrowed anteriorly and the abdomen tapering posteriorly. Head doubled onto ventral surface and body incurved ventrally. Appendages free. This Pusa example pupated on 19th October, and the adult emerged on 25th October, 1917."

Mr. Gardner writes: "I am indebted to the Imperial Entomologist, Agricultural Research Institute, Pusa, for the loan of a specimen of the larva of *Calosoma indicum*, Hope. This is readily distinguished from *Calosoma beesoni* as follows: The first joint of the labial palp is distinctly longer than the second. The cerci are rather more divergent and are more slender distally. The 7th and 8th tergal plates have more prominent

postero-lateral angles. The 9th tergal plate is less transverse, and is provided with longer postero-lateral teeth (fig. 11), which are hidden by the cerci when viewed from above. In the specimen seen the dorsal plates are dark castaneous and the dorsal spine of each of the cerci has a small tooth, which gives the apex a bifurcate appearance."

4. Calosoma imbricatum, *Klug.*

Calosoma imbricatum, Klug * in Ehrenberg's Symb. Phys., Decas iii, 1832, t. 23. f. 11; Heyne-Tasch., Die Exotischen Käfer, 1895. p. 11; Roeschke, Ent. Nachr. 1900, p. 61; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 145; id., Ann. Mag. Nat. Hist. (9) xix, 1927, p. 100; id., Ent. Mitt. 1927, p. 142; Alluaud, Ann. Mus. Civ. Gen. lii, 1928, p. 69; Breuning, Mon. (i), pp. 140, 149, and 221.
Caminara arabica, Motchulsky, Bull. Mosc. 1865, ii, p. 304.

Colour black, upper surface dark bronze, head and prothorax very dark, elytra sometimes brownish; apex of joints 1–4 of antennæ and of joints of palpi brown; punctures on primary intervals brassy green. Upper surface rather dull, shiny beneath.

Head flat, eyes prominent, labrum a little rugose, surface rather finely and closely punctate, very finely on clypeus, neck coriaceous, more or less strigose between eyes, gula with a seta on each side, mandibles elongate, with half a dozen transverse ridges, mentum almost smooth, lobes feebly bordered, a seta on each side of tooth at base, maxillary palpi with joint 3 half as long again as 4, antennæ with joints 2 and 3 compressed, 1 to 3 carinate. *Prothorax* moderately convex, much wider than head, more than half as wide again as long, contracted about equally at extremities, base bisinuate, bordered at sides only, apex truncate, with a thick border, thinner at sides, sides strongly rounded, with a reflexed border reaching base, gently sinuate before hind angles, a seta at middle, another rather before base, hind angles (owing to the basal sinuation) projecting a little backwards; median line short, basal foveæ fairly deep, rounded, surface finely vermiculate-punctate, very finely at sides of disk, more coarsely and confluently along base and marginal channels. *Elytra* convex, with well-marked shoulders, widest at apical fourth and very slightly narrowed towards base, two-thirds as wide again as prothorax, half as long again as wide, sides with narrow reflexed border strongly serrate behind shoulder, and often along entire length; striate, the punctures in the striæ indistinct, primary intervals each with a series of 12 to 15 punctures, three intervals between the primaries, all narrow, convex, and strongly imbricate, including basal area and suture. *Sternum*: sterna, except along median line, rather sparsely punctate, proepisterna practically smooth, prosternal process bordered to apex, metepisterna

not much longer than wide, with a deep sulcus along outer margin. *Venter* very uneven at sides of base, very finely and irregularly rugose-punctate, segments 2 and 3 more or less pubescent in middle, 6 with some transverse striæ. *Legs*: mesotibiæ slightly curved, rather slightly clothed with foxy hairs, on outer margin, metatibiæ straight.

Length, 19–22 mm.; width, 8–9·5 mm.

SIND: Karachi. CANARY IS.: Tenerife. CAPE VERDE ISLANDS. CAPE VERDE (type). LAKE CHAD. SUDAN. ABYSSINIA. BRITISH EAST AFRICA. ARABIA: El Hedjaz. (*Millingen*). IRAK: Basra. PERSIAN GULF: Ashtola Island.

Type in the Berlin Zoological Museum.

4 *a*. **Calosoma imbricatum**, *Klug*, var. **andrewesi**, *Breun.*

Calosoma imbricatum andrewesi, Breun., Mon. (iii), Kol. Rundsch. 1928, p. 95.

Calosoma orientale, Chaudoir (not Hope), Ann. Soc. Ent. Fr. 1869, p. 368; Breuning, Mon. (i), pp. 140 and 223.

I did not, when at Rennes, have the opportunity of examining Chaudoir's type, and therefore give below a translation of his description.

"A female. It is extremely like *imbricatum*, of which it has the dimensions and the form. The head does not differ; the prothorax is slightly longer, with its upper surface more finely sculptured; the elytra are duller; the striæ are much less impressed, the intervals much flatter; the transverse lines are very fine, but very clearly marked, and the intervals which separate them resemble flat scales. The underside of the body is as in *imbricatum*. The colour is the same, but the elytra are less shiny; the three bright green rows of punctures are similar. Is it the *Calosoma orientale* of Hope?"

Length, 23 mm.; width, 9 mm.

BENGAL (North of the Presidency) (*Dr. Bacon*).

Type in Mr. René Oberthür's collection.

In his Monograph Dr. Breuning treats Chaudoir's species as an eastern form of *imbricatum*. This opinion is confirmed by the fact that Dr. Breuning has in his collection an example from Assam, which he has been good enough to send me for examination, and which agrees fairly well with Chaudoir's description. This example is very nearly black, the punctures on the elytra silvery (side view). The head and prothorax hardly differ, when compared with those of an example of *imbricatum*; the prothorax has the base quite unbordered, the surface more finely sculptured, rugose-punctate rather than punctate-rugose. The elytral striæ are finer, as is the cross-striation, so that the surface is much more even, the primary intervals, except for the punctures, not differing from the others.

5. Calosoma olivieri, *Dej.*

Calosoma olivieri, Dejean *, Spec. Gen. v, 1831, p. 559; Mayet, Bull. Soc. Ent. Fr. 1887, p. 173 (larva); Bedel, Cat. rais. Col. Nord Afr. 1895, p. 20; Lapouge, Bull. Soc. Sci. Méd. Ouest, 1908, p. 162 (larva); Alluaud, Bull. Soc. Ent. Fr. 1918, p. 251; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 145; id., Ent. Mitt. 1927, p. 143; Breuning, Mon. (i), pp. 140, 149, and 224; Alluaud, Ann. Mus. Civ. Gen. lii, 1928, p. 68.

Calosoma azoricum, Heer, Ueber fossil. Calos., in Leonhard u. Bronn N. Jahrb. Mineral. (Stuttgart), 1861, p. 55; Wollaston, Cat. Col. Canar. 1864, p. 4.

Colour black, the punctures on the primary intervals metallic green. Upper surface moderately shiny; under surface shiny.

Head flat, eyes prominent, clypeal suture nearly obsolete, surface finely punctate, strigose near eyes, neck coriaceous, gula with a seta on each side, mandibles elongate, transversely strigose-rugose, mentum small, bordered, a seta on each side of tooth at base, epilobes rather wide, maxillary palpi with joint 3 half as long again as 4, antennæ with joints 2 to 4 compressed and carinate, 1 slightly carinate. *Prothorax* small, moderately convex, nearly half as wide again as head, and as much wider than long, about equally contracted at extremities, base arcuate in middle, sinuate close to angles, apex truncate, with a well-marked border, thicker in middle, sides strongly and evenly rounded, with a border, which becomes very narrow at each end, but reaches base, a seta at middle and another at some distance before angles, no sinuation before base, hind angles projecting shortly backwards; median line fine, basal foveæ fairly deep, but wide and rounded, surface closely and more or less confluently punctate, very finely on disk, more coarsely along margins. *Elytra* moderately convex, with well-marked shoulders, widest at apical third and narrowing gently to base, not quite twice as wide as prothorax, and a little more than half as long again as wide, sides with narrow, rather strongly reflexed border, serrate behind shoulder; striate, with punctures in the striæ on basal half of disk, primary intervals a little wider than the others, each with about ten small, tuberculate punctures, very small towards apex, five intervals between the primaries, of which the middle one is clearly defined, the two on each side of it being partially fused, all intervals flat and imbricate, more coarsely at base, more finely towards apex. *Sternum*: sterna more or less punctate, except along median line, proepisterna nearly smooth, prosternal process strongly bordered at sides up to apex, metepisterna quite a third as long again as wide, coarsely and sparsely punctate and pubescent (as are the contiguous sides of the metasternum), some smaller punctures mingling with the larger ones. *Venter* a little uneven at sides,

finely punctate, minutely towards apex, 2 and 3 pubescent in middle, 4 and 5 generally with several setæ on each side of median line. *Legs*: tibiæ straight, mesotibiæ clothed on outer side with some foxy hairs.

Length, 20–27 mm.; width, 9–11 mm.

N.W Front. Prov.: Peshawar (Ind. Mus.); Taru (*T. B. Fletcher*—Pusa Coll.). Baluchistan: Nushki and Quetta districts (*E. Vredenburg*—Ind. Mus.). North Africa. Azores, Cape Verde, and Canary Is. Asia Minor. Syria. Arabia: Muscat (*M. Maindron*). Irak: Bagdad (type), Basra, Assur. Transcaspia. Turkestan. Persia.

Type in Mr. René Oberthür's collection.

The habitat of this species extends from one end to the other of the sandy belt comprised in the North African and South-West Asian Coasts, from Cape Verde to N.W India. It appears to be rare at its Eastern limit, and I have seen only three Indian specimens, all from Peshawar. One of these is labelled "*Calosoma orientale*, Hope, which attacks young locusts (*Acridium peregrinum*), W R. H. Merk, Esq., 22. v. 91." These specimens are apparently those referred to as having been exhibited by Mr. E. C. Cotes at a meeting of the Bombay Natural History Society (Journ. Bomb. Nat. Hist. Soc. vi, 1891, p. 416), when it was stated that they fed voraciously on young wingless locusts (*Acridium peregrinum*).

Mr. Fletcher reports the species as predaceous on *Cirphis unipuncta*.

Mr. Lapouge writes of the larva: "A little narrower than *inquisitor*. Brown, the spot on the telson very slight. Mesolabrum very short, depressed, the median fold hollowed out into a furrow behind, the folds raised in comma-shape, the convexity within and behind; teeth more widely separated, a little divergent. Disk spread out. Upper and lower armature as in *inquisitor*, but the hind angles of the telson wider at the base, more triangular than spiniform. Cerci nearer together at the base, the inner spine longer, inserted beyond the first third, the outer one indicated by a blunt asperity at two thirds; in *inquisitor* the inner spine is placed at the first third. First instar, 14 by 2 mm.; second instar, 20 by 3½ mm. Gafsa, dung (*Mayet*).

"The example of the first instar shows, in relation to that of the second, the same differences as in *inquisitor*. The lateral lobes are much less advanced in the first instar, and the mesolabrum not shorter; moreover, this phenomenon is common in the young larvæ of *Carabus*.

"Differs only from *inquisitor* in having the mesolabrum a little shorter, the median teeth more separated, the outer denticles a little less marked, the raised folds of the mesolabrum

more distant and less parallel in front, the angles of the telson a little more marked, the cerci nearer at the base, furnished with more evident spines, perhaps by the absence of an orange spot on the telson. The differences exist in both instars and appear proper to the species.

"Described by Mayet as belonging to *olivieri*, these larvæ are perhaps those of *inquisitor*, but differ widely from all the other known species."

It would appear that the identification of the larva of this species is still somewhat uncertain.

6. Calosoma orientale, *Hope*.

Calosoma orientale, Hope, Trans. Zool. Soc. Lond. i, 1833, p. 92; Roeschke, Ent. Nachr. 1900, p. 61; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 202; id., Trans. Ent. Soc. Lond. 1921, p. 145; Breuning, Mon. (i), p. 184; id., Mon. (iii), Kol. Rundsch. 1928, p. 95.

Calosoma squamigerum, Chaudoir*, Ann. Soc. Ent. Fr. 1869, p. 368; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 145; Roeschke, Ent. Nachr. 1900, pp. 59 and 61; Breuning, Mon. (i), pp. 139, 147, 184, and 223.

Colour piceous-black, upper surface very dark bronze, rather dull, shiny beneath, punctures on primary intervals brassy-green.

Head flat, eyes prominent, frontal foveæ fairly deep, labrum nearly smooth, but pitted at sides with very large setigerous pores, surface very finely and closely punctate, a little more coarsely on vertex, where some minute punctures mingle with the larger ones, the puncturation almost disappearing on neck; gula without setæ, mandibles elongate, very coarsely striate, mentum with a few slight punctures, lobes unbordered, without setæ at base of tooth, maxillary palpi with joint 3 half as long again as 4, antennæ with joints 2–4 compressed, 1–4 carinate. *Prothorax* moderately convex, much wider than head, more than half as wide again as long, a little more contracted behind than in front, base rather gently bisinuate, hardly bordered, apex truncate, with a thick border, thinner at sides, sides gently curved in front, sharply rounded in middle (almost angulate), and nearly straight behind, with a thick reflexed border, reaching base, slightly sinuate just before angles, a seta at middle, but none visible behind (in the specimens examined), hind angles rather sharp, deflexed, and projecting a little backwards; median line faint, basal foveæ rather shallow, rounded, surface finely and very closely punctate, more coarsely along margins, especially along base. *Elytra* convex, with well marked shoulders, widest at apical

fourth, and very slightly contracted towards base, two-thirds as wide again as prothorax, and half as long again as wide, with narrow reflexed border, rather strongly serrate behind shoulder, and again slightly near apex ; striæ deep, the punctures in them very small and inconspicuous, primary intervals each with a series of 12–15 punctures, three intervals between the primaries, all narrow, strongly convex, and imbricate, including basal area and suture. *Sternum* : sterna sparsely punctate, smooth along median line, proepisterna nearly

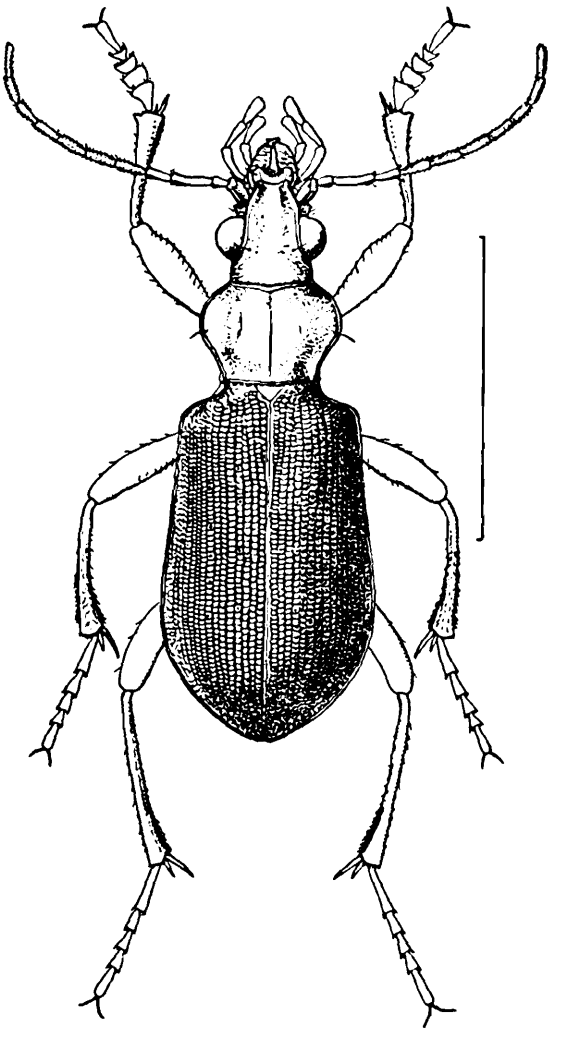


Fig. 11.—*Calosoma orientale*, Hope, ♂.

smooth, prosternal process bordered throughout, metepisterna a third longer than wide, with a shallow sulcus along external margin. *Venter* uneven at sides of base, very finely punctate, more coarsely and sparsely towards base, last segment with some striæ at apex. *Legs* : mesotibiæ ♂ strongly, ♀ moderately curved, with a clothing of foxy hairs towards apex on both inner and outer margins, metatibiæ ♂ ♀ slightly curved, with foxy hairs near apex on outer margin.

Length, 22–28 mm.; width, 9–11·25 mm.

BENGAL (Oxford Mus.). BIHAR: Chapra (*Mackenzie*). CENTRAL PROVINCES: Khandwa (*E. A. D'Abreu*—Nagpur Mus.). BOMBAY: Poona (type) and Nasik (Pusa Coll.). MADRAS: Coimbatore and Manaparai (Pusa Coll.); Madura.

Type lost, that of *C. squamigerum* in Mr. René Oberthür's collection.

There have been differences of opinion regarding the identity of *orientale*, Hope, but there are two very good reasons for considering it as synonymous with *squamigerum*. (i.) In Hope's description we read "The only *Calosoma* allied to the present is *Cal. chlorostictum*, Klug," and superficially the two species are very much alike, differing widely from any other Indian form; (ii.) the type specimen was taken at Poona, and, apart from the small Karachi example of *imbricatum* in the British Museum, no other *Calosoma* has been found, roughly speaking, south of the Ganges line. I have myself collected more than once in the vicinity of Poona, but was not so fortunate as to come across a *Calosoma*; it is to be hoped that other collectors may be more successful.

One other species of *Calosoma* must be referred to:—

Calosoma nigrum, Parry, Trans. Ent. Soc. Lond. iv, 1845 p. 85; Breuning, Mon. (i), pp. 140, 215, and 218.

"Black, mandibles falciform, indented; prothorax transverse, rounded, small; elytra four times as long as the prothorax, dilated behind, and with rows of punctures disposed in three lines. Body beneath black, legs of the same colour.

"Length, lin. 14; width, lin. 7½.

"The species of *Calosoma* from the East Indies are evidently rare. *C. chinense* of Kirby is the only species mentioned in Dejean's Catalogue; the Rev. F W Hope possesses another received from Bombay, and I believe there is a fourth described from the collection of Col. Sykes.

"Khasi Hills (Assam)."

The type is lost, and the description would apply to a good many species of the genus. The only specimen I have seen from Assam is in the collection of Dr. Breuning, who identifies it, probably rightly, with *orientale*, Chaud. (not Hope) (= *imbricatum*, Klug, var. *andrewesi*, Breun.).

It seems probable that the type of *nigrum* is a large example of *maderæ* v. *indicum*, Hope, which sometimes attains 31 mm. in length, but in the circumstances speculation is useless, and I have not included the species in the Key.

Genus CARABUS.

Carabus, Linnæus, Syst. Nat. ed. x, 1758, p. 413; Dejean, Spec. Gen. ii, 1826, p. 30; Lacordaire, Gen. Col. i, 1854, p. 54; Reitter, Best. Tab. eur. Col. xxxiv, Carabini, 1896, p. 54.

Imaïbius, Bates, Proc. Zool. Soc. Lond. 1889, p. 211; Kraatz, Deutsch. Ent. Zeitschr. 1895, p. 364; Reitter, Best. Tab. p. 94; Roeschke, Ent. Nachr. 1900, p. 58; id., Deutsch. Ent. Zeitschr. 1907, p. 542; Andrewes in Mission Babault Ind. Carab. 1924, p. 7.

Tropidocarabus, Kraatz, Deutsch. Ent. Zeitschr. 1895, p. 366 (= *Imaïbius*, Bates).

Meganebrius, Kraatz, Deutsch. Ent. Zeitschr. 1895, p. 366; Reitter, Best. Tab. p. 192; Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 409.

Indocarabus, Lapouge, Misc. Ent. 1921, p. 119 (sep. pag.).

TYPE, *Carabus granulatus*, L. (Palæarctic region.)

Head of variable dimensions, sometimes inflated behind, sometimes with a neck constriction, gula usually with a seta on each side; eyes as a rule moderately prominent, distant from buccal fissure, generally with a single supraorbital seta; clypeus rather small, usually bisetose, generally emarginate in front, the more or less developed frontal foveæ extending forward on to its sides, clypeal suture fine, labrum habitually well developed, often wider than clypeus, nearly always emarginate in front, often deeply indented and depressed at middle, with a row of setæ along the margin; mandibles powerful, of variable form and length, generally curved and sharp at apex, smooth or finely punctate on upper surface, without any seta in the scrobe, inner margin beneath densely clothed with hairs, and with a single or double tooth at about middle; ligula very short, plurisetose at apex, paraglossæ free, generally a little longer than ligula, minutely setose; mentum emarginate and with a tooth in the emargination, which is often sharp, sometimes bifid, usually flat, but in the Indian subgenus *Imaïbius* developed into a stout, triangular, vertical plate; maxillæ sharply hooked at apex, densely fringed with hairs along inner margin; palpi stout, the terminal joint generally dilated, sometimes securiform, joint 2 of the labials either bisetose or plurisetose on inner margin; antennæ pubescent from joint 5, though joint 5 is not always fully pubescent, joint 1 with or without a seta, joints 2 and 3 rarely a little compressed or constricted at base, the intermediate joints in the ♂ occasionally abnormal. *Prothorax* generally cordate, sometimes quadrate, usually with bordered sides and at least one front marginal seta present, hind angles frequently produced a little backwards and sometimes deflexed. *Elytra* without basal border, side border generally smooth, rarely dentate behind shoulder, usually a little, but sometimes deeply

emarginate before apex. The sculpture of the striæ is extremely variable, but in the simplest case there are present about 16 striæ and a corresponding number of intervals. Of the intervals the fourth, eighth, and twelfth are called primary intervals; between these are three intervals, of which the middle one in each case is called a secondary interval, and the other two tertiary intervals. The term quaternary interval is sometimes applied to minute rows of asperities appearing between the other intervals. At sides and apex both striæ and intervals often disappear or are lost in the irregular, asperate surface. The primary intervals are often catenulate, *i. e.*, they are broken up by a series of large punctures, each puncture usually containing a minute tubercle. The primaries are habitually wider than the others, the secondaries sometimes wider than the tertiaries. Sometimes the intervals are doubled, sometimes the tertiaries disappear, occasionally the secondaries as well, or all the striæ and intervals may disappear, in which case the surface is sometimes smooth, or on the contrary very rough and irregular. *Sternum*: prosternal process produced and projecting over the mesosternum, which is vertically keeled in front; metepisterna somewhat variable, but generally short. *Venter*: segments 4 to 6 often transversely sulcate, 1 to 3 occasionally setose at sides, 4 and 5 either glabrous, or more often with one or more setæ on each side of median line, the number of setæ at apical margin variable. *Legs*: procoxal cavities open behind, metacoxæ meeting, each with at least one setiferous pore; tibiæ occasionally somewhat produced at apex; protarsi ♂ with either 3 or 4 dilated joints, very rarely undilated. Body generally apterous, but occasionally winged. The ædeagus is of variable form.

Range. Palæarctic and Nearctic regions. Chili.

These insects, which are of large or moderate size, are often beautifully coloured, many of them having a metallic sheen. The species are very numerous, and the manifold forms, found more particularly in the palæarctic region, have been widely collected and studied. The division and subdivision of species have been carried to such lengths that well over a hundred subgenera have been described, some of them containing but a single species, while under many of the species appear quite as many names of subspecies, varieties, and aberrations. I have given above the names of one or two subgenera proposed for Indian species, but have not attempted to deal with the subgeneric complex any further. The subgenus *Imaïbius*, however, is founded on a body of species, all the members of which present the same remarkable form of mentum; they form a well-defined and compact group, which is confined to the mountains of Kashmir and the adjoining Indian territory.

Practically nothing is known of the biology of the Indian species, but the larvæ of a good many palæarctic ones have been described by various authors. Mr. Lapouge, in Bull. Soc. Sci. Méd. Ouest, 1905 to 1908, has published a series of papers on the larvæ of various species of *Carabus* and *Calosoma;* one or two Indian ones are included, though these were not apparently bred, and translations of the descriptions will be found under the respective species.

Key to the Species.

1 (14) Tooth of the mentum normal, horizontal.

2 (11) Gula glabrous, joint 2 of labial palpi bisetose, border of elytra not, or only faintly sinuate before apex, small species of under 24 mm. in length.

3 (8) Prothorax cordate, its sides strongly sinuate before hind angles, apex slightly and widely emarginate, with a narrow border, front angles hardly deflexed.

4 (7) Prothorax with a pore and seta at hind angle, elytral striæ vaguely punctate.

5 (6) Frontal foveæ extending back to level of eye, prothorax with a single front lateral seta, its surface punctate, elytra with primary intervals a little wider than the others. Length 21 mm.. .. . .. . *wallichi*, Hope, p. 75.

6 (5) Frontal foveæ extending back to base of antennæ only, prothorax with two or three lateral setæ in front, its surface finely rugose-striate elytra with all intervals of equal width. Length about 18 mm. .. *everesti*, sp. nov., p. 76.

7 (4) Prothorax without pore and seta at hind angles, elytral striæ with rows of minute tubercles (so-called quaternary intervals) between them. Length about 17·5 mm. . *indicus*, Fairm., p. 78.

8 (3) Prothorax more or less quadrate, sides very gently sinuate before hind angles, apex somewhat deeply emarginate at middle, with a wide border, front angles evidently deflexed.

9 (10) Head and prothorax vaguely rugose, joints 3 and 4 of antennæ not constricted at base, elytra relatively smooth, primary intervals standing

out conspicuously, the areas surrounding their tubercles and behind shoulder cupreous. Length about 19·5 mm. .... .. *wagæ*, Fairm., p. 80.

10 (9) Head, prothorax, and elytra all very roughly sculptured, joints 3 and 4 of antennæ constricted at base, primary intervals not standing out conspicuously, a slight æneous or greenish tinge behind shoulder. Length about 22 mm. .... *sanchari*, Andr., p. 82.

11 (2) Gula bisetose, joint 2 of labial palpi plurisetose, border of elytra evidently sinuate before apex, larger species of 27–32 mm. in length.

12 (13) Prothorax with a single lateral seta at middle, elytra with 15 finely punctate striæ and nearly equal intervals, venter with some fine puncturation and pubescence at sides of base. Length 27 mm. *feæ*, Gestro, p. 84.

13 (12) Prothorax with two lateral setæ at middle, elytra without punctured striæ, but with six raised intervals alternately entire and catenulate, venter with a few coarse punctures on each side of second segment. Length 32 mm.. .. .. *birmanus*, sp. nov., p. 85.

14 (1) Tooth of the mentum large, triangular, and vertical (*Imaïbius*).

15 (20) Elytra shiny, covered with large pits, intervals not developed into regular raised lines, apex practically without granulation, protarsi ♂ undilated.

16 (17) Pits on the elytra very irregular, closely set, and confluent. Average length 38 mm. .. . *barysomus*, Bates, p. 87.

17 (16) Pits on the elytra not very closely set, more or less rounded and not generally confluent.

18 (19) Pits on the elytra of unequal size, fairly numerous, and rather irregularly placed. Average length 33·5 mm. . .. .. . *barysomus*, Bates, var. [*hügeli*, Roesch., p. 90.

19 (18) Pits on the elytra of nearly equal size, few in number, and regularly placed on the primary intervals. Average length 44 mm. .. *barysomus*, Bates, var. [*heroïcus*, Sem., p. 90.

20 (15) Elytra rather dull, at least primary and secondary intervals developed as raised lines, apex more or less granulate, protarsi ♂ dilated.

21 (22) Elytra fully striate, the raised intervals of about equal width, all much interrupted and becoming

tuberculate behind, extending from suture to marginal channel, usual pits quite inconspicuous, apex sparsely and not very finely granulate, protarsi ♂ with 3 dilated joints. Average length 34 mm. .. . . *caschmirensis*, Redt., [p. 91.

22 (21) Elytra with raised intervals, primaries more or less catenulate, with rows of conspicuous pits, the others not interrupted, space between third primary and margin not distinctly striate, apex finely granulate.

23 (26) Elytra with only primary and secondary intervals, the primaries formed by a series of broad, flattened tubercles, alternating with pits, secondaries formed by raised lines, apex finely but not densely granulate, protarsi ♂ with 3 dilated joints.

24 (25) Elytra regularly sculptured, with three primary intervals, formed by large, flat tubercles and alternating, inconspicuous pits, secondaries slightly serpentine in form. Average length 31 mm. .. ... *rostianus*, Sem., p. 93.

25 (24) Elytra irregularly sculptured at sides and apex, with four primary intervals, the outer one very irregular, the tubercles small, the pits conspicuous, secondaries straight though irregular. Average length 28 mm. . .. *stoliczkanus*, Bates, p. 94.

26 (23) Elytra fully striate, intervals narrow, about equally wide, primaries catenulate, with rows of comparatively small pits, apex finely and sometimes densely granulate, protarsi ♂ with 4 dilated joints.

27 (30) Epipleura of elytra terminating rather suddenly near apex.

28 (29) Head with a single clypeal and a single supraorbital seta on each side, prothorax cordate, surface of elytra finely granulate throughout, epipleura rounded at extremity. Average length 30·5 mm. .. *boysi*, Tatum, p. 95.

29 (28) Head with two clypeal and two supraorbital setæ on each side, prothorax subquadrate, surface of elytra granulate on sides and apex only, epipleura more or less truncate. Average length 25·5 mm.. . . . *epipleuralis*, Sem., p. 96.

30 (27)	Epipleura of elytra tapering towards apex.	
31 (36)	Elytra with the primary intervals wider than the others, the pits of medium size, apical granulation generally distinct.	
32 (35)	Elytra with the punctured striæ and intervals all clearly visible. Average length 26 mm.	
33 (34)	Elytra dull, with regular sculpture, all secondary and tertiary intervals similar.	*dardiellus*, Bates. p. 97.
34 (33)	Elytra rather shiny, sculpture irregular towards apex, secondary intervals 2 and 3 raised	*dardiellus*, Bates, var. [*klägeri*, Kr., p. 98.
35 (32)	Elytra with the punctured striæ clearly visible only near suture, tertiary intervals almost obsolete, surface generally subgranulate. Average length 24·5 mm. . .	*dardiellus*, Bates, var. *granulisparsus*, Bates, p. 98.
36 (31)	Elytra with all intervals of equal width, the primaries with small pits, apical granulation indistinct. Average length 23·5 mm. . .	*dardiellus*, Bates, var. *subpunctulus*, Roesch., p. 99.

7. Carabus wallichi, *Hope*.

Carabus wallichi, Hope *, Zool. Misc. 1831, p. 21; Roeschke, Ent. Nachr. 1900, p. 59; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 171; id., Ann. Mag. Nat. Hist. (9) vii, 1921, p. 409.

Colour black.

Head comparatively small, slightly convex, neck very little inflated and not constricted, eyes prominent, frontal foveæ deep, front bordered at sides, a ridge between border and fovea, clypeus bisetose, slightly emarginate, suture fine, labrum short, as wide as clypeus, surface finely and rather sparsely punctate, front almost smooth, strigose on vertex and near eyes, neck slightly coriaceous; gula glabrous, mandibles short but acuminate, mentum glabrous, with a moderately sharp tooth in the sinus, shorter than lobes, epilobes wide, palpi stout, maxillaries with joints 3 and 4 equal, labials with 2 much longer than 3, bisetose on inner margin, without setæ at apex; antennæ stout (but only joints 1-4 remain), 1 quite as long as 3, all very little contracted towards base.

Prothorax cordate, a little convex, nearly half as wide again as head, a third as wide again as long, a little more contracted in front than behind, widest at apical third, base very indistinctly bordered, strongly sinuate on each side near hind angles, the margin flattened at that point, apex widely and moderately emarginate with a fine distinct border, sides strongly rounded in front, with a long and rather strong sinuation before base,

border thick and strongly reflexed, without trace of crenulation, (apparently) with a setiferous pore in marginal channel at about middle, and another rather before hind angle, front angles rounded but very evident, hind angles sharply rounded, deflexed, produced backwards and projecting slightly laterally; median line fine, reaching extremities, lying at bottom of a slight depression, transverse impressions slight, basal foveæ fairly deep and wide, surface rather shiny, uneven rather than rugose, moderately but not closely punctate, the punctures confluent at sides and base.

Elytra ovate, moderately convex, rounded at apex, shoulders fairly marked close to base, but then cut sharply away, half as wide again as prothorax, two-thirds as long again as wide, widest behind middle, sides strongly rounded, not sinuate before apex, epipleura bordered within, tapering behind; about 18 finely punctured striæ, the outer ones very fine and close together, scutellary striole distinct, continued as a fine stria along suture to apex, punctate near base, sutural interval slightly raised near apex only, primaries hardly wider than the other intervals, with 6–10 punctures, as wide as intervals, all the inner intervals wider, smoother, and less convex than the outer ones, secondary and tertiary intervals minutely tuberculate at sides and near apex, where there are also a few granules in the striæ, apex finely and irregularly granulate. *Sternum*: sterna nearly smooth, episterna and sides of metasternum with a few punctures, prosternal process unbordered, its apex rounded and shortly setose, mesosternum hollowed, metepisterna very nearly as wide as long. *Venter* rugose-punctate along sides, segments bordered, a single seta on each side of median line, last segment ♀ smooth, a single seta on each side at about middle, and 4–5 along each side of margin. *Legs*: pro- and mesotrochanters with a seta, mesocoxæ with two setæ, lateral and apical, metacoxæ with two small basal setæ close together and a large discal setiferous pore, mesofemora with a row of 10–12 setæ beneath, metafemora with 8; tarsi long and slender.

Length, 21 mm.; width 8 mm.

NEPAL (*Gen. Hardwicke*).

Type ♀ in the British Museum.

The type is unique and is the only specimen of a *Carabus* I have seen from Nepal.

8. **Carabus everesti**, sp. nov.

Colour black.

Head rather small, but not contracted behind eyes, neck slightly dilated, eyes very prominent, genæ inconspicuous, frontal foveæ short and rather shallow, not extending back-

wards beyond base of antennæ, clypeus bisetose, emarginate in front, sides finely and irregularly striate, vertex nearly smooth, neck very finely vermiculate-rugose; gula glabrous, mandibles long, curved, and sharp, labrum quite as wide as clypeus, depressed at middle, deeply emarginate, mentum glabrous, with a short sharp obtuse tooth in the emargination, the surface behind it only slightly raised; maxillary palpi with joint 4 hardly longer than 3, labials with 2 much longer than 3, inwardly bisetose, and glabrous at apex; antennæ long and slender, reaching middle of elytra, joint 1 stout, a little shorter than 3, 2 about two-thirds of 3, a little stouter and shorter than 4, 5 to 11 very slender, 5 setose throughout. *Prothorax* cordate, moderately convex, a third wider than head and a sixth wider than long, rather more contracted in front than behind, widest at apical third, base gently bisinuate, indistinctly bordered, apex slightly emarginate and very narrowly bordered, sides well rounded in front, with a long and gentle sinuation to base, border moderately thick, slightly reflexed, with two or three setæ in the marginal channel in front, and another well in front of base, front angles strongly rounded, hind angles projecting a little both laterally and backwards, rounded though a little acute; median line very fine, transverse impressions very slight, basal foveæ shallow and inconspicuous, surface finely and irregularly rugose-striate, with only a suggestion of puncturation at sides of base. *Elytra* rather flat, elongate-ovate, rather more than a half wider than prothorax and four-fifths longer than wide, widest well behind middle, shoulders nearly rounded away, sides almost straight in front but well rounded behind, with a very narrow reflexed border, without sinuation behind, epipleura smooth but with a few transverse wrinkles, ending rather abruptly behind; about 17 striæ, vaguely punctate here and there, the outer ones fine and close together, scutellary striole short and indistinct; intervals narrow and convex, of equal width, primaries with a series of a dozen interruptions rather than punctures on each, each section raised behind into a minute tubercle, secondaries and tertiaries exactly alike, surface uneven along sides and broken up close to apex, but not asperate, except for the row of minute tubercles within marginal channel. *Sternum*: sterna smooth, prosternal process unbordered, multisetose at apex, as is the middle of the mesosternum, metepisterna as wide as long. *Venter* smooth, though uneven and with one or two small punctures along sides, the segments with a single seta (occasionally 2 setæ) on each side, apical segment ♂ with 2 setæ, ♀ with 3 or 4 on each side, last three segments rather faintly transversely sulcate. *Legs*: pro- and mesotrochanters with a seta, meso-coxæ with 1 apical seta and 2 lateral ones, metacoxæ

with 2 setæ, mesofemora with a row of about 8, metafemora about 4 setæ beneath, mesotibiæ ♂ clothed externally on apical half with reddish hairs, tarsi rather long and slender, protarsi ♂ with four dilated joints.

Length, 17–19 mm.; width, 6–7 mm.

TIBET: Rongshar Valley, 9500–11,000 ft. (*R. W G. Hingston*).

Type in the British Museum.

Four specimens were taken by Major Hingston on the Mount Everest Expedition of 1924. At first sight this new species bears a strong resemblance to *wallichi*, but it is smaller and rather narrower, and, as will be seen from the descriptions, differs in a number of its characters.

9. **Carabus indicus**, *Fairm.* (Figs. 1–3 *a*.)

Carabus indicus, Fairmaire*, Bull. Soc. Ent. Fr. 1889, p. 15; Kraatz, Deutsch. Ent. Zeitschr. 1895, p. 366; Reitter, Best. Tab. p. 192; Roeschke, Ent. Nachr. 1900, p. 59; Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 409.

Carabus wallichi, Bates (not Hope), Compt. rend. Soc. Ent. Belg. 1891, p. 324.

Colour black.

Head rather small, slightly convex, neck hardly inflated and not constricted, eyes very prominent, frontal foveæ fairly deep and narrow, clypeus bisetose, slightly emarginate, suture very fine, labrum short, as wide as clypeus, surface finely and uniformly rugose-punctate; gula glabrous, mentum glabrous, the sinus rather shallow, tooth moderately sharp, shorter than lobes, which are rounded at sides and apex, epilobes wide, mandibles short, but very sharply acuminate, maxillary palpi with joints 3 and 4 equal, labials with 2 much longer than 3, bisetose on inner margin, without setæ at apex; antennæ slender, reaching basal third of elytra, joint 1 thick, very slightly shorter than 3, 2 hardly shorter than 4 and about two-thirds of 3, 5–11 a little shorter than 3 and much more slender than 1–4, 5 setose throughout. *Prothorax* cordate, slightly convex, nearly half as wide again as head, a third as wide again as long, a little more contracted in front than behind, widest at apical third, base gently bisinuate, indistinctly bordered, apex widely and moderately emarginate and narrowly bordered, sides strongly rounded in front, with a long and gentle sinuation to base, border moderately thick, reflexed, with traces only of crenulation, a single seta (rarely two) just before middle, none at hind angle, front angles rounded, hind angles produced a little backwards, deflexed, and therefore a little less than right, but rounded; median line fine, reaching extremities, lying at the bottom of a slight longitudinal depression, transverse impressions rather slight, basal

foveæ well marked and rather elongate, surface finely rugose with some inconspicuous punctures at margins, more coarsely along base and sides. *Elytra* convex, elongate-oval, pointed at apex, rather less than half as wide again as prothorax, very nearly twice as long as wide, shoulders and sides both rounded, latter with a narrow reflexed border, not (or only slightly) sinuate before apex, epipleura tapering at extremity; about 18 striæ, the outer ones very fine and close together, scutellary striole indistinct, a fine additional stria running along each side of the slightly raised suture; intervals narrow and convex, primaries a little wider than the others, each with a series of 6–8 punctures, as wide as interval, a slight tubercle in front of each, secondary and tertiary intervals of equal width, slightly tuberculate, more evidently so at sides and near apex, where the striation tends to disappear, a slight, irregular row of granules running between all the intervals. *Sternum*: sterna nearly smooth, episterna and sides of metasternum more or less punctate, prosternal process unbordered, mesosternum slightly hollowed, metepisterna very nearly as wide as long. *Venter* rugose-punctate along sides, finely rugose at apex, segments bordered, a single seta (sometimes two) on each side of median line, anal segment (♂ ♀) generally with a single seta on each side at about middle, and 3–5 irregularly disposed along each side of margin. *Legs*: pro- and mesotrochanters with a seta, mesocoxæ with two setæ, lateral and apical, metacoxæ with a single large setiferous discal pore, mesofemora with a row of 8–10 setæ beneath, metafemora with only 4–5, mesotibiæ ♂ clothed externally on apical half with reddish hairs, tarsi rather long and slender, protarsi ♂ with four dilated joints.

Length, 17–20 mm.; width, 6–7·5 mm.

SIKKIM: Darjiling ((type), and *R. B. Horsfall*—Ind. Mus.); Mungphu (*E. T. Atkinson*); Gopaldhara and Tonglu, 10,000 ft. (*H. Stevens*). ASSAM: Khasi Hills (*Kricheldorff*).

Type in the Indian Museum.

I formerly regarded this species as a race of *C. wallichi*, Hope, but the different sculpturing of the upper surface, the absence of a seta at the hind angles of the prothorax, and some other characters detailed above now lead me to think that, although closely allied to that species, it should be treated as distinct.

The two examples from Assam in Dr. H. Roeschke's collection have the primary intervals more definitely catenulate, the secondaries and tertiaries more evidently and more frequently broken by slight depressions, and the minute asperations between the intervals, at sides, and at apex more conspicuous.

Kraatz suggested a new subgenus *Meganebrius* for *C. indicus*,

the sole distinctive character mentioned being the strong posterior contraction of the prothorax. Reitter adds to this (Bestimmungs-Tabelle der europäischen Coleoptera, Carabini, 1896, pp. 191-2) that the prothorax has in front at least two, generally three, lateral setæ, but so far as my observations go, resulting from the examination of twenty or more specimens, there is usually only one lateral seta, though more rarely two are present.

10. Carabus wagæ, *Fairm.*

Carabus wagæ, Fairmaire*, Ann. Soc. Ent. Fr. 1882, p. 65; Andrewes, Ent. Month. Mag. 1926, pp. 66 and 70.

Colour black: joint 1 of antennæ very dark red, marginal channel of elytra behind shoulder and a smooth area surrounding each of the tubercles in the primary intervals and at sides cupreous.

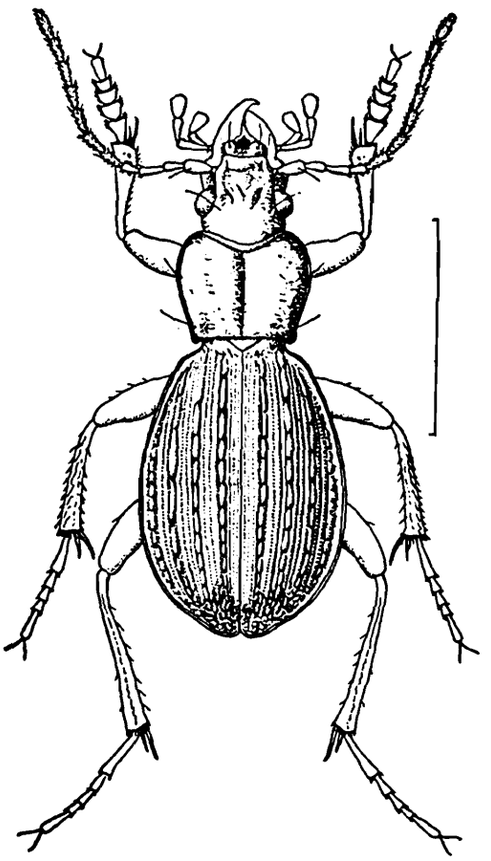


Fig. 12.—*Carabus wagæ*, Fairm., ♂.

Head wide, not contracted behind eyes, neck somewhat dilated, eyes moderately prominent, genæ inconspicuous, lateral impressions vague on front, but deep on the clypeus, which is bisetose, emarginate in front and depressed at middle, two vague sulci behind, converging on vertex, a small rounded

pore between them, some irregular striation near eyes, back of vertex with a few punctures, neck vaguely vermiculate-rugose; gula glabrous, mandibles long, curved, and sharp, labrum with the lobes diverging in front, and a deep semicircular depression between them, mentum glabrous, with a comparatively short sharp tooth in the emargination, the surface behind it raised into a smooth, rounded boss; maxillary palpi with joint 4 a trifle longer than 3, labials with 2 much longer than 3, inwardly bisetose and glabrous at apex; antennæ thick, reaching basal fifth of elytra, joint 1 stout, slightly longer than 3, 2 about three-fourths of 3, 4 a little shorter than 2, remaining joints about equal to 3, but more slender, 5 setose throughout. *Prothorax* slightly convex, a fourth wider than head, and as much wider than long, much more contracted in front than behind and widest at apical third, base unbordered, slightly and widely emarginate, apex rather widely bordered and deeply emarginate at middle, strongly declivous at sides to the front angles, which adjoin neck and are very little rounded, sides bordered and sometimes a little crenulate behind, gently rounded in front and barely sinuate before base, two marginal setæ, one at two-fifths from apex, the other well in front of base, hind angles slightly rounded and projecting a little both downwards and backwards; median line fairly deep, basal foveæ represented on each side by a shallow, rounded pore, surface rather shallowly vermiculate-rugose, with vague indications of puncturation, chiefly near margins. *Elytra* ovate, convex, two-thirds wider than prothorax and half as wide again as long, widest rather behind middle, shoulders almost obsolete, sides with a fine border, not much reflexed, very slightly sinuate before apex in both sexes; about 18 striæ, which are narrow and not very deep, with a suggestion of fine puncturation, a little more evident near suture, where the striæ are a little nearer together, intervals extending to near apex, secondaries and tertiaries narrow and similar, primaries half as wide again, each broken up, a little irregularly, by about a dozen punctures, each one as wide as the interval and with a tubercle in front of it, an irregular fourth primary, extending from a third to five-sixths, lying between the row of tuberculate punctures beyond the outmost tertiary and the marginal channel, surface near apex very uneven, and, as also along margins, with some minute tubercles; epipleura smooth, irregularly canaliculate at base. *Sternum*: sterna smooth, prosternum depressed in the middle, its process sometimes lightly bordered at sides, its apex setose; metasternum both transversely and longitudinally sulcate, its process strongly bordered at sides, metepisterna as wide as long. *Venter* smooth, uneven along sides, the segments bisetose, last one subrugose, with 2 to 4 setiferous pores on each side in

both sexes. *Legs*: pro- and mesotrochanters with a seta, mesocoxæ with two or three lateral and one apical seta, metacoxæ with two pores, mesofemora with about 7 setæ beneath, metafemora with 3, mesotibiæ ♂ with a rather slight clothing of reddish hairs, protarsi ♂ with four dilated joints.

Length, 18–21 mm.

UNITED PROVINCES: Almora, Girthi Valley, Matoli, 14,500 ft. (*H. G. Champion*).

Type in Mr. René Oberthür's collection.

The species was described from a single ♀ specimen taken by Mr. Stanislas Rembielinski and sent to Fairmaire by Prof. Waga. According to the description it came from North India, but is actually labelled "Tibet." I have examined the type, but have not had an opportunity of comparing Mr. Champion's specimens with it; they agree, however, with the original description, as far as it goes, and with my notes. The brown colour mentioned by the author is probably due to immaturity.

11. **Carabus sanchari**, *Andr.*

Carabus sanchari, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p 407.

Carabus wagæ, Lapouge (not Fairm.), Misc. Ent. 1921, p. 118 (sep. pag.); Andrewes, Ent. Month. Mag. 1926, p. 66; Breuning, Kol. Rundsch. 1926, p. 67.

Colour black, with faint æneous reflections on upper surface.

Head wide, flat, neck moderately inflated, without constriction, eyes rather prominent, frontal foveæ short but moderately deep, clypeus bisetose, emarginate in front, with a few punctures on each side of middle, suture very fine, labrum rather short, as wide as clypeus, surface coarsely and confluently rugose-punctate; gula glabrous, mandibles stout but not elongate, blunt at apex, a bifid tooth on each at about middle, upper surface with some fine punctures, mentum glabrous, smooth but uneven, with a simple tooth, rounded and a little dilated at apex, as long as lobes, palpi stout but short, maxillaries with joints 3 and 4 equal, labials with 2 bisetose on inner margin, without setæ at apex; antennæ reaching basal fifth of elytra, the joints short, 1 thick, a little longer than 3, 2 equal to 4, 3 about half as long again as 2 and equal to remaining joints, 3 and 4 strongly constricted at base, 5 setose throughout. *Prothorax* quadrate, rather flat, but declivous towards front angles, not quite a third as wide again as head, and not quite a third as wide again as long, rather more contracted in front than behind, widest rather before middle, base slightly bisinuate, indistinctly bordered, curving a little backwards near angles, front rather deeply emarginate,

with rather wide border, sides gently rounded in front and lightly sinuate behind, with a thick reflexed and slightly crenulate border, a seta at apical third and another rather before hind angle (both of these occasionally duplicated), front angles deflexed and a little rounded, hind angles about right, but strongly rounded, deflexed, and projecting a little backwards ; median line distinct, transverse impressions obsolete, basal foveæ rather shallow and indistinct, surface coarsely and confluently rugose-punctate. *Elytra* convex, elongate-ovate, with rounded shoulders, a little more than half as wide again as prothorax, and about two-thirds as long again as wide,

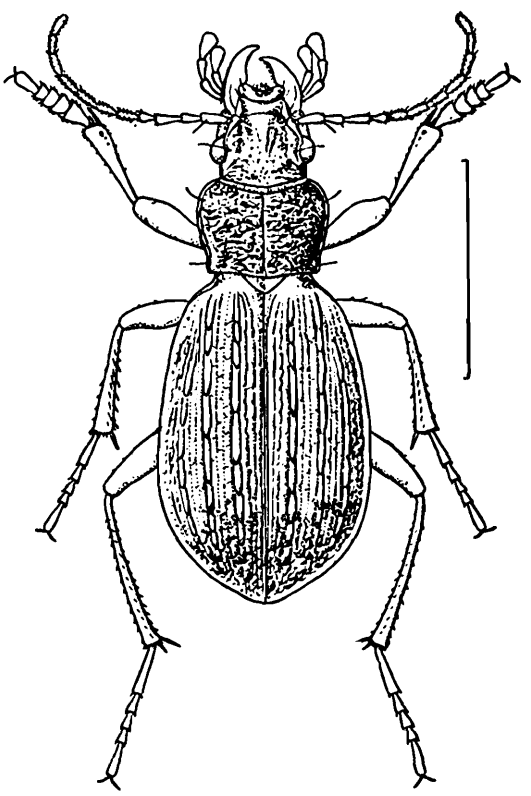


Fig. 13.—*Carabus sanchari*, Andr., ♂.

widest rather behind middle, sides strongly rounded behind, with narrow slightly reflexed border, not sinuate before apex, epipleura gradually narrowed and terminating some little way before apex ; about 18 faintly punctured striæ, but in addition the vague scutellary striole is continued as a fine line along the sides of the slightly raised suture, intervals moderately convex, the three primaries a little wider than the others, each with about ten punctures of same width as intervals, a minute tubercle in front of each puncture, secondary and tertiary intervals of equal width, their evenness broken by slight ill-defined granules and depressions, apical fourth very irregularly sculptured, and, with the marginal channel and two or three narrow intervals adjoining it, minutely tuber-

culate. *Sternum*: sterna smooth, prosternal process wide, flat, unbordered, mesosternum very deeply hollowed in middle, metepisterna slightly wider than long, sometimes with one or two shallow punctures. *Venter* a little punctate at sides, with unbordered segments, a single seta on each side of median line, anal segment with one marginal seta towards base, and ♂ 2, ♀ 3 at each side near apex. *Legs*: pro- and mesotrochanters with a seta, mesocoxæ with a seta at inner apical angle, metacoxæ with two setæ on disk, one behind the other, and a third at inner apical angle, mesofemora with a row of about 8 setæ beneath, metafemora with 4 or 5 only, mesotibiæ ♂ clothed externally on apical half with reddish hairs, tarsi comparatively short, protarsi ♂ with four dilated joints.

Length, 19–24 mm.; width, 7·5–9 mm.

SIKKIM: Gnatong and beyond Jalep. TIBET: Phari, 16,000 ft. (*R. W G. Hingston*).

Type in my collection.

12. **Carabus feæ**, *Gestro*.

Carabus feæ, Gestro *, Ann. Mus. Civ. Gen. xxvi, 1888, p. 106; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 269; Breuning, Kol. Rundsch. 1926, p. 70.

Colour piceous black; joints 5–11 of antennæ dark brown, clothed with a short yellowish pubescence.

Head small, slightly convex, neck inflated, eyes moderately prominent, frontal foveæ wide and fairly deep, divergent behind, extending in front to near front margin of clypeus, where they terminate on each side in a pore and seta (two on left side in the unique specimen), a pore (but no seta apparent) on each side in the foveæ just behind the suture, front of clypeus deeply depressed in middle, front, clypeus, and labrum smooth, surface behind coriaceous, wrinkled irregularly on vertex, transversely on neck; gula with a seta on each side, mandibles smooth, stout, curved and very sharp at apex, mentum small, glabrous, with a small but sharp tooth, carinate beneath, lobes slightly rounded and bluntly pointed at apex, palpi moderately dilated at apex, labials with joint 2 plurisetose; antennæ elongate, with slender joints, reaching rather beyond middle of elytra, 5 setose throughout. *Prothorax* rather flat, very nearly twice as wide as head, not much wider than long, more contracted in front than behind, but widest at middle, base truncate, but running obliquely backwards close to hind angles, apex slightly emarginate and bordered, sides rounded in front, with a fairly thick border, gently sinuate near base, marginal setæ well inside border, front one at middle, hind one rather before base, front angles much rounded, inconspicuous, hind angles slightly acute, rounded, and

deflexed; median line fine, reaching extremities, a triangular depression in front, basal foveæ slight, punctiform, surface finely coriaceous and transversely striate, a few punctures in front, base finely rugosely punctate, slightly aciculate towards sides. *Elytra* moderately convex, elongate-oval, shoulders very oblique, not more than a third wider than prothorax, twice as long as wide, sides with narrow reflexed border, distinctly sinuate before apex, epipleura tapering very gradually and disappearing at sinuation; 15-striate, the striæ finely punctate, scutellary striole slight and irregular; intervals convex, the primaries hardly wider than the others, broken by a series of eight or ten depressions, each with a minute tubercle in front, inner intervals bending outwards towards apex, which is irregularly rugose and slightly granulate, marginal channel wide, enclosing three or four irregular rows of minute granules. *Sternum*: sterna generally smooth, proepimera separated by a very clear suture from the episterna, prosternal process with a shallow groove between coxæ, hardly bordered, rounded and setose at apex, sides of meso- and metasternum and metepisterna slightly punctate, metepisterna as wide as long, widely bordered in front. *Venter* with bordered segments, finely and rugosely punctate at sides, some punctures and pubescence on segments 2 and 3 between sides and middle, 4 and 5 with a single seta on each side of median line, anal segment ♂ transversely striate-rugose, two setæ on one side, three on the other (in the unique specimen). *Legs* (♂): pro- and mesotrochanters with a seta, meso- and metacoxæ with two setæ, in the latter on disk and at inner apical angle, mesofemora with an upper row of 8 punctures in front, 20 beneath, metafemora with about 8 punctures above, a row of 10 or 12 beneath, tibiæ straight, mesotibiæ clothed with foxy hairs on outer apical half, meso- and metatarsi elongate, protarsi with 4 dilated joints clothed beneath with a dense hairy pad.

Length, 27 mm.; width, 8·5 mm.

BURMA: Kachin Mountains (*L. Fea*).

Type ♂ in the Genoa Museum.

The type is the only specimen I have seen.

13. Carabus birmanus, sp. nov.

Colour black, moderately shiny; joints 5–11 of antennæ clothed with short yellowish pubescence.

Head elongate, slightly convex, with moderately constricted neck, inflated behind, eyes prominent, remote from buccal fissure, frontal foveæ wide and deep, extending to near front angle of clypeus, which is smooth, emarginate in front and bisetose, clypeal suture fine but evident, labrum large, smooth,

rather wider than clypeus, emarginate and deeply depressed at middle, front and vertex uneven, neck coarsely coriaceous ; gula with a single seta on each side, mandibles long, strong, curved, and sharp at apex, mentum glabrous, with a small but sharp tooth, lobes rounded at apex, palpi stout and moderately dilated, apical joint not channelled, maxillaries with 3 longer than 4, labials with 2 quite a half longer than 3, plurisetose on inner margin, glabrous at apex, ligula carinate and bisetose beneath at apex, with three setæ on each side, paraglossæ very wide, leathery, adnate, extending considerably beyond ligula, rounded and setose at apex ; antennæ reaching quite to basal third of elytra, joint 1 stout, about equal to 3, 2 about two-thirds of 3, 4 a little longer and narrower than 2, 5 setose throughout. *Prothorax* cordate, moderately convex, nearly twice as wide as head, not much wider than long, much more contracted in front than behind, widest at about middle, base truncate but curving backwards near hind angles, emarginate and narrowly bordered in front, side border rather thick in front, disappearing at middle, where the sides become moderately explanate and where there are two large setiferous pores, reflexed and with a fairly sharp sinuation before hind angles, which are a little less than right, deflexed and projecting a little backwards, but not laterally, a pore (presumably setiferous) in front of the angle ; median line distinct, reaching both extremities, deeper at each end, a triangular depression in front, basal foveæ wide and long, but not very deep, surface uneven, finely coriaceous and transversely strigose, a few longitudinal striæ at middle of base. *Elytra* convex, elongate-ovate, with distinct shoulders, a fourth wider than prothorax, and twice as long as wide, sides with narrow reflexed border, sinuate close to apex, epipleura tapering and disappearing at sinuation ; the three primary intervals strongly catenulate from base to apex (as in *C. ullrichi*, Germ.), the secondary ones forming three elevated ridges on each elytron (as in *C. septemcarinatus*, Motch., but the suture, carinate in that species, is here hardly sensibly raised), the inner and outer ones continued to about a third, the intermediate one to a fourth from apex, a distinct stria between outer primary and margin, and immediately outside it a row of granules, but in addition the whole surface is finely and irregularly granulate, more finely and vaguely on disk, between the costæ. *Sternum* : sterna smooth, proepimera separated by a very clear suture from episterna, prosternal process vaguely sulcate and bordered, but the border does not reach apex, which is rounded and setose, mesosternum sharply bordered in front, depressed in middle, narrowly excavate behind, metepisterna as wide as long, widely bordered in front, with some fine but slight punctures. *Venter* uneven at sides, half a dozen coarse punctures

on each side of second segment, a single pore on each side of median line, anal segment ♂ irregularly strigose, with two pores on one side, one on the other (in the unique specimen), last three segments transversely sulcate. *Legs* (♂): pro- and mesotrochanters each with a pore, mesocoxæ with a pore near inner apical angle, metacoxæ with two pores, one on disk and one at inner apical angle, mesofemora with a double row of 8 pores each in front, another row of a dozen behind, metafemora with a double row of about 8 in front and 10 behind, tibiæ straight, mesotibiæ clothed with foxy hairs outside on apical half, meso- and metatarsi elongate, protarsi with four dilated joints clothed beneath with a dense hairy pad.

Length: 32 mm.; width, 9·75 mm.

BURMA: Ruby Mines (*Doherty*).

Type ♂ in the British Museum.

The type is the only example I have seen.

14. Carabus barysomus, *Bates*.

Imaïbius barysomus, Bates*, Proc. Zool. Soc. Lond. 1889, p. 210; Kraatz, Deutsch. Ent. Zeitschr. 1895, p. 364, fig. p. 369; Reitter, Best. Tab. p. 94; Roeschke. Deutsch. Ent. Zeitschr. 1907, pp. 543 and 547; Lapouge, Bull. Soc. Sci. Méd. Ouest, 1907, p. 37 (larva).

Colour black, moderately shiny, apex of palpi and antennæ very dark red.

Head rather narrow, moderately convex, nearly smooth, but with some vague striation, especially near eyes, which are rather prominent, frontal foveæ deep but wide, one clypeal and one supraorbital seta on each side. *Prothorax* cordate, convex, transverse, though not much wider than long, half as wide again as head, both base and apex slightly and widely emarginate, front angles rounded, sides a little explanate, with a thick border, which is moderately reflexed at extremities, and slightly crenulate, rounded in front and sinuate some little way before base, hind angles rounded, but projecting outwards and downwards; median line fine but strongly impressed, obsolete at extremities, hind transverse impression and basal foveæ deep, surface moderately smooth, but a little rugose along margins, finely transversely striate near median line. *Elytra* elongate-ovate, convex, half as wide again as prothorax, and very nearly twice as long as wide, shoulders obsolete, sides gradually widening to apical third, faintly sinuate both behind shoulder and near apex, which is not vertical, rounded in ♂, more pointed in ♀; the usual striæ and intervals hardly distinguishable, though some fine punctures can be seen here and there, the whole surface broken up into deep pits, of varying size, and more or less confluent, each one with a minute tubercle at bottom, the sculpture a

little less irregular on disk, epipleura narrowing very gradually to near apex. *Sternum*: metepisterna distinctly longer than wide. *Venter* uneven at sides, impunctate. *Legs* long and powerful; front tarsi ♂ simple. Ædeagus pointed.

Length, 33–44 mm.; width, 11·5–15 mm.

KASHMIR: Gurais Valley (*J. H. Leech*—type); Pir Panjal (*C. Rost*); "Kashmir" (*T. R. D. Bell*); Batote (*B. M. Bhatia*). N.W FRONTIER PROVINCE: Hazara, Lower Kagan Valley, Sharan, 8000 ft. (*H. G. Champion*). Elevation 8000–10,000 ft.

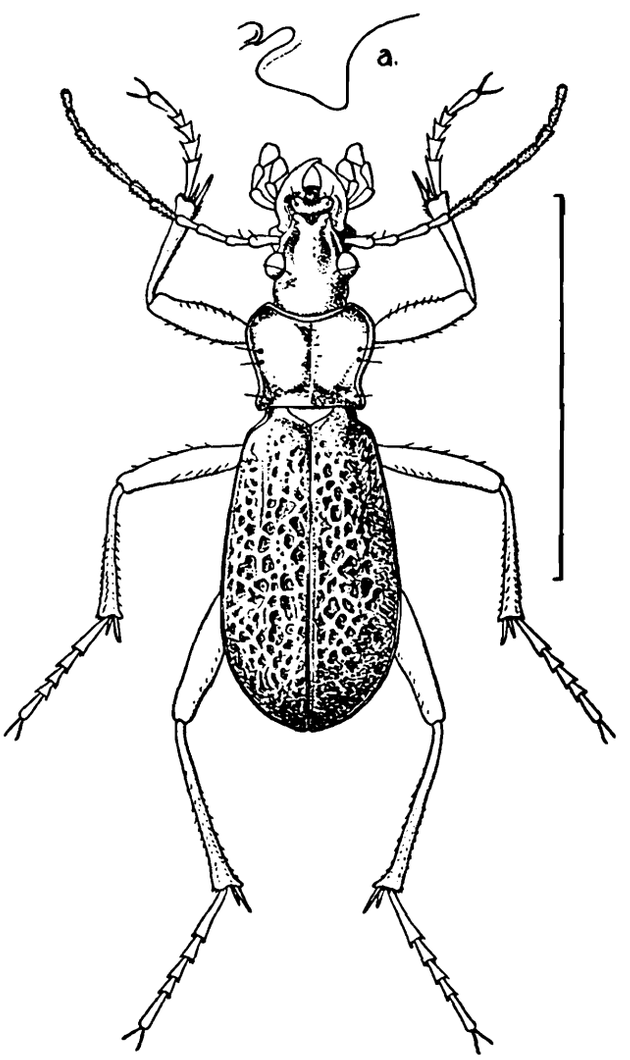


Fig. 14.—*Carabus barysomus*, Bates, ♀.
(*a*) Tooth of mentum, viewed laterally

Type in Mr. René Oberthür's collection.

The following is a translation of Mr. Lapouge's description of the larva:—

"Parallel, the extremities semielliptical. Three and a half times as long as wide. Black. Head rugose, finely striate in the direction of the declivities, with a transverse band of coarser striæ in front of the disk, and another starting from the summit of the front and widening out fanwise on the

summit of the disk ; tegmina shagreened ; all the upper surface covered, especially the last segments, with hemispherical granules, smooth, equal, on a background which appears under the microscope to be formed of infinitely small juxtaposed granulations. Head wide. Labrum a little enlarged in front, the lobes unequal, the median lobe about a third wider than the lateral ones. Outer lobe outwardly swollen, very widely at the base, depressed and flat within and in front ; outer margin smooth and a little sinuate ; the angle very wide, much rounded, directed forwards, and dilated a little outwardly ; the outer margin with a generally oblique direction, a little emarginate near the angle, arcuate up to the sinus, which is reduced to a notch. Median lobe triangular, rather short, very swollen, ending in a large tooth, the point of which is truncate and bifid, the dehiscence not prolonged behind on the lobe. Disk spread out, not much swollen, wide, dull, bifoveolate ; at the top a small central depressed area with fairly smooth edges on each side of the fan. Supraocular tubercles rounded, very prominent, in the form of a blunt cone. Mandibles long. Antennæ and palpi long and slender, the antennæ a third longer than the mandible. Last joint of the labials in the form of a Chinese woman's boot. Pronotum trapezoidal, the sides strongly arcuate and the angles rounded, the front more than the hind one, meso- and metanotum more parallel, but similarly formed. Tergites wide. Tegmina wide, projecting about 2 mm. Front angles much rounded, those of the apical segments even more so ; protelson and telson with sides only a little arcuate, and generally a little sinuate before the hind angle. Lobes very large, occupying half of the semi-width of the tergite, a third as long as the tergite, rather more in the posterior segments ; hind margin strongly arcuate, angle right and sharp, a little less than right in the case of the posterior segments, that of the protelson a little produced and acuminate, thrown a little outwards by the sinus of the outer margin. Telson with the front angles much rounded, sides slightly arcuate, a little sinuate near the hind angle, margin behind almost straight, curved back at the angles only, which are narrow, produced, spiniform, and directed a little outwards. Supra-anal margin not bordered, but little marked between the cerci. Cerci rough, stout, a little longer than the protelson, strongly divergent, inserted very low down, forming an angle of 45° with the horizontal, very faintly arcuate, the extremities erect and tending to converge. Inner spine inserted at half length, of medium size, pointed, arcuate, and turned upwards ; outer one a little further from base, very small, conical, and pointed. Pleural tubercles wide, short, and oval ; sub-pleural ones three times as long as wide, that of the first abdominal segment

divided. Pectoral sclerites large. Front median plates elliptical, four times as wide as high; hind ones joining the first two segments, and united to the following ones, forming a single band in the form of a parallelogram with rounded angles, five or six times as wide as high. Outer plate in the form of a rather vague right-angled triangle, the external and posterior sides almost straight, the hypotenuse a little convex. Underside with coarse setæ. Legs long.—Second instar, 33 by 9 mm.; third instar, 43 by 12 mm. Himalayas, Kashmir, summer, 5 ex. acquired from Rost.

"The specimens of the second instar are less rough; the head is smaller and the cerci more slender, the decurrent lobes a little shorter, those of the protelson and telson more sinuate, the telson narrower, the angle more produced, the hind margin more arcuate."

A further paragraph discusses the relationship between this larva and those of various palæarctic species.

14 *a*. **Carabus barysomus,** *Bates*, var. **hügeli,** *Roesch.*

Imaïbius barysomus, Bates, subsp. *hügeli*, Roeschke *, Deutsch. Ent. Zeitschr. 1907, p. 548; Lapouge, Bull. Soc. Sci. Méd. Ouest, 1907, p. 39 (larva).

Rather smaller than the typical form, and with a slightly wider prothorax. The chief difference lies in the sculpture of the elytra, which are smoother and less irregular. The striæ and punctures, though still very indistinct, are more visible; the pits are not placed so closely together and are confluent near apex only, those on the primary clearly larger than those on the secondary intervals.

Length, 29–38 mm.; width, 9·5–13·5 mm.

KASHMIR: Mountains north-east of Islamabad (*C. Rost*).

Type in Dr. H. Roeschke's collection.

Mr. Lapouge describes the larva as follows:—

"An example of the third instar, also brought back from Kashmir by Rost, is a little smaller and has the median tooth of the labrum hardly notched. Perhaps of the second instar: the decurrent lobes are a little shorter, more sinuate in the protelson and telson, the latter smaller, more emarginate behind, the angle more produced, characters of *barysomus* in the second instar, but a little more pronounced. This larva does not differ in any other way from that of *barysomus*."

14 *b*. **Carabus barysomus,** *Bates*, var. **heroïcus,** *Sem.*

Carabus heroïcus, Semenow, Rev. Russ. Ent. 1906, p. 395.

Carabus colossus, Semenow (not Bleuse), Rev. Russ. Ent. 1906, p. 266; Roeschke, Deutsch. Ent. Zeitschr. 1907, pp. 530 and 559.

Imaïbius barysomus, Bates, subsp. *caroli*, Roeschke *, Deutsch. Ent. Zeitschr. 1907, pp. 530 and 549.

Larger than the typical form, the prothorax a little wider, sides less sinuate behind, hind angles right, more rounded, not projecting laterally; striæ and punctures barely perceptible, surface much smoother than in the other forms, with three regular rows of rounded pits on the three primary intervals, one or two smaller pits on the secondary intervals, close to apex.



Fig. 15.—*Carabus barysomus*, Bates, var. *heroïcus*, Sem., ♂.
(Natural size.)

Length, 38–50 mm.; width, 13·5–17 mm.

KASHMIR: Mountains west of Pir Panjal and north of Punch (*C. Rost*).

Type in the Museum of the Academy of Sciences, Petrograd; that of *caroli* in Dr. H. Roeschke's collection.

15. Carabus caschmirensis, *Redt.*

Carabus caschmirensis, Redtenbacher in Hügel's Kaschmir, iv, 2, 1844, p. 499, t. 23. f. 4; Bates, Scientific Results of Second Yarkand Mission, 1891, Col. p. 3; Roeschke, Ent. Nachr. 1900, p. 58; Lapouge, Bull. Soc. Sci. Méd. Ouest, 1908, p. 168 (larva); Fowler, Fauna Brit. Ind., Col. (Introd.), 1912, p. 54, f. 24.

Carabus lithuriophorus, Tatum *, Ann. Mag. Nat. Hist. xx, 1847, p. 14; Roeschke, Ent. Nachr. 1900, p. 62; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 181.

Tropidocarabus caschmirensis, Kraatz, Deutsch. Ent. Zeitschr. 1895, p. 366.

Imaïbius caschmirensis, Reitter, Best. Tab. p. 94; Roeschke, Deutsch. Ent. Zeitschr. 1907, pp. 544 and 549.

Colour black, rather dull, apex of antennæ piceous.

Head narrow, moderately convex, surface finely wrinkled, nearly smooth in front, eyes rather prominent, frontal foveæ

fairly deep, one clypeal and one supraorbital seta on each side. *Prothorax* cordate, slightly convex, transverse, though only a little wider than long, nearly two-thirds as wide again as head, base rather deeply, apex only slightly emarginate, front angles rounded ; sides moderately explanate, especially behind, with a thick border, disappearing towards middle, but reflexed at extremities, rounded in front and sharply sinuate at basal third, hind angles rather sharp, projecting outwards, downwards, and backwards ; median line fine but clearly marked, basal transverse impression deep, the foveæ rather shallow, surface on disk fairly smooth, though with some fine transverse

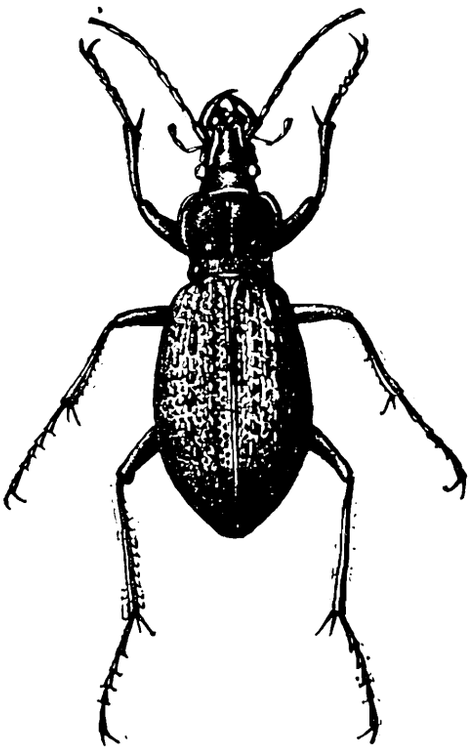


Fig. 16.—*Carabus caschmirensis*, Redt., ♀. (Natural size.)
(After Fowler.)

wrinkles, margins—especially base—more or less rugose-punctate. *Elytra* elongate-oval, convex, half as wide again as prothorax, and three-quarters as long again as wide, shoulders obsolete, sides with very narrow reflexed border, faintly sinuate behind, the surface falling sharply but not vertically to apex, which is narrowly flattened out; there are about fifteen punctate striæ, the convex intervals between them broken up into sections of varying length, on the three primaries these sections are generally longer and wider, on the secondaries shorter and more broken up, while the tertiaries are frequently merely rows of small tubercles, the first primary dilated near base and rather conspicuous, apex minutely tuberculate, surface a little more shiny than that of head and prothorax, epipleura

narrowing gradually to apex, though not tapering so much as in *barysomus*. *Sternum*: metepisterna hardly longer than wide. *Venter* very uneven at sides, and generally with some puncturation. *Legs* long and powerful; front tarsi in ♂ with three dilated joints, mesotibiæ produced on inner side at apex. Ædeagus bluntly pointed.

Length, 28–40 mm.; width, 10–14 mm.

KASHMIR (type); Mountains west of Pir Panjal and north of Punch, 5000–6000 ft. (*C. Rost*). PUNJAB: Murree (*F. Stoliczka*—Ind. Mus.), Simla, Kulu. UNITED PROVINCES: Naini Tal; Mussoorie (*S. N Chatterjee*); Chakrata, Kathian, Binsar, 6000 ft., Kanasar, 7050 ft. (*S. N Chatterjee*), and Jaunsar Himalaya, 7000 ft. (all For. Res. Inst.).

Type in the Vienna Natural History Museum; that of *C. lithariophorus* in the British Museum. Although I have not seen Redtenbacher's type, I have in my collection a specimen which has been compared with it by Dr. Holdhaus.

Mr. Lapouge describes the larva as follows:—

"Differs from *barysomus* by its smaller size, slightly narrower form, smoother upper surface, and especially the less rugose head, the tegmina projecting less; lobes with their external margin more subsinuate, the angle more pointed, a little extroverted in the apical tergites; telson smaller, its base narrower, its outer sides more arcuate, the posterior margin straighter, the angle marked by a simple spine, smaller and more extroverted; median plates only a little more than three times as wide as high in the third instar, four times in the first. For the rest, labrum, cerci, legs, identical with *barysomus*, especially with the var. *hügeli*. An example of the third instar has the emargination of the median tooth even shallower than the larva of *hügeli*. First instar, 24 by 5 mm.; third instar, 36 by 9 mm. Western Himalaya, Kulu, summer 1906, Rost, 3 ex. There is no other species in the locality.

"First instar: telson smaller, and therefore a smaller interval between the points, and a deeper emargination behind; cerci longer and straighter; plates beneath shorter, as is usual in the young larvæ of Carabi."

16. Carabus rostianus, *Sem.*

Carabus rostianus, Semenow, Rev. Russ. Ent. 1906, p. 267.
Imaïbius rostianus, Roeschke *, Deutsch. Ent. Zeitschr. 1907, pp. 545, 550, and 559.

Colour black, moderately shiny.

Head inflated, convex, surface finely wrinkled, eyes small but moderately prominent, frontal foveæ deep and narrow in front, wide and shallow behind, two clypeal and one (sometimes two) supraorbital setæ on each side. *Prothorax* cordate,

slightly convex, transverse, nearly half as wide again as long, only a third as wide again as head, base very little, apex rather more deeply emarginate with an ill-defined border, front angles rounded, sides narrowly explanate, border thick, reflexed chiefly behind, gently rounded in front and very moderately sinuate behind, hind angles right but rounded, projecting a little downwards; median line fine, basal impressions fairly deep, surface coriaceous, the base—and to some extent the apex—moderately punctate. *Elytra* convex, elongate-oval, but rather pointed at apex, especially in ♀, half as wide again as prothorax, and rather less than twice as long as wide, shoulders obsolete, a very narrow reflexed border, which is only faintly sinuate behind, apex slightly flattened out; the three primary intervals are formed by three rows of large, flattened tubercles, generally longer than wide, with a fairly deep round pit between each two adjacent ones, the secondaries consist of flat raised costæ, narrower than and to some extent encroached upon by the primary tubercles, between each primary and secondary an ill-defined row of coarse punctures, vestiges of another interval behind between third secondary and border, surface surrounding primary tubercles, especially behind and at sides, closely and minutely tuberculate, epipleura narrowing gradually to apex. *Sternum*: metepisterna hardly longer than wide. *Venter* uneven at sides, practically impunctate. *Legs* long; front tarsi in ♂ with three dilated joints, mesotibiæ produced on inner side at apex. Ædeagus spatulate.

Length, 27–35 mm.; width, 10–12·5 mm.

KASHMIR: North-east of Islamabad, 5000–6000 ft.; Songam and Dusu, south-east of Islamabad, 6000–10,000 ft. (*C. Rost*); Lidar Valley, Tanin, 9000 ft. (*B. M. Bhatia*).

Type in the Museum of the Academy of Sciences, Petrograd; Dr. Roeschke's type in his own collection.

17. **Carabus stoliczkanus**, *Bates*.

Carabus stoliczkanus, Bates *, Proc. Zool. Soc. Lond. 1878, p. 713; id., Scientific Results of Second Yarkand Mission, 1891, Col. p. 3, t. 1. f. 13; Roeschke, Ent. Nachr. 1900, p. 62; (?) Lapouge, Bull. Soc. Sci. Méd. Ouest, 1908, p. 169 (larva).

Imaïbius stoliczkanus, Reitter, Best. Tab. p. 94; Roeschke, Deutsch. Ent. Zeitschr. 1907, pp. 546 and 552.

Colour black, rather dull: apex of palpi reddish.

Head narrow, convex, surface smooth with some very faint wrinkles, eyes small and prominent, foveæ well marked, two clypeal and two supraorbital setæ on each side. *Prothorax* cordate, very slightly convex, transverse, about a third as wide again as long, half as wide again as head, extremities

distinctly emarginate, apex more or less bordered, sides with a thick, ill-defined, reflexed border, gently rounded in front and slightly sinuate at some distance from base, hind angles less than right, projecting a little downwards and backwards; median line very fine, basal transverse impression rather shallow, foveæ linear at bottom but only slightly impressed, surface finely coriaceous, rather indistinctly punctate along base and apex. *Elytra* convex, elongate-oval, very nearly twice as long as wide, and very nearly half as wide again as prothorax, shoulders much rounded in ♂, obsolete in ♀, a very narrow reflexed border, sinuate behind in ♀, apex rather pointed and flattened out; four primary and four secondary intervals, but of these only the three inner primary and two inner secondary are clearly defined, the primaries formed by alternate flattened tubercles and rounded pits, the secondaries by straight raised lines, the sculpture at sides and behind formed by irregularly placed pits, the apex minutely tuberculate, striæ not very clearly punctate, epipleura tapering but ending a little brusquely. *Sternum*: metepisterna as wide as long. *Legs*: front tarsi in ♂ with three dilated joints, mesotibiæ produced on inner side at apex. Ædeagus spatulate.

Length, 25–31·5 mm.; width, 8·5–11 mm.

KASHMIR: Mountains west of Pir Panjal, 6000–10,000 ft. (*C. Rost*). PUNJAB: Murree (*F Stoliczka*—type); Campbellpore (*C. Rost*).

Type in the Indian Museum, Calcutta.

Mr. Lapouge supposes that the undetermined larva described by him as No. 14 (Bull. Soc. Sci. Méd. Ouest, 1907, p. 39) is either that of this species or that of *epipleuralis*.

18. **Carabus boysi**, *Tatum*.

Carabus boysi, Tatum*, Ann. Mag. Nat. Hist. (2) viii, 1851, p. 51; Bates, Entomologist, 1891, Suppl. p. 8; Roeschke, Ent. Nachr. 1900, p. 62; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 181; id. in Mission Babault Ind. Carab. 1924, p. 7; id., Ent. Month. Mag. 1926, p. 66.

Tropidocarabus wallichi, Kraatz* (not Hope), Deutsch. Ent. Zeitschr. 1895, p. 366; Reitter, Best. Tab. p. 95.

Imaïbius boysi, Roeschke, Deutsch. Ent. Zeitschr. 1907, pp. 546 and 553.

Colour black, and as a rule rather dull.

Head moderately wide, convex, with prominent eyes, finely wrinkled, the disk more or less punctate, neck coriaceous, one clypeal and one supraorbital seta on each side. *Prothorax* cordate, slightly convex, transverse, half as wide again as head, and a fourth as wide again as long, extremities very moderately emarginate, apical border

generally present, sometimes obsolete, sides with a thick, reflexed border, well rounded in front, strongly sinuate at a fourth from base, hind angles rather sharp, projecting backwards and downwards, the side border near them strongly reflexed; median line very fine, transverse basal impression obsolete, the foveæ rounded, only moderately deep, surface finely and closely rugose-punctate, more finely on disk, more coarsely along base. *Elytra* very convex, especially behind, elongate-ovate, the widest point some little way behind middle, rather less than twice as long as wide, about half as wide again as prothorax, shoulders nearly obsolete, a very fine reflexed border, slightly sinuate (more in the ♀) near apex, which is rather steeply declivous; fully striate, the primary intervals a little raised, but not much wider than the others, evidently catenulate, being broken up by large, rather shallow, rounded pits, a good deal wider than the interval and each with a small tubercle at bottom, the secondary and to some extent the tertiary intervals fairly clear on the disk, but the whole surface, especially towards sides and apex, finely granulate-aciculate, a distinct trace of a fourth primary interval between third and margin, epipleura tapering very little behind but not ending so abruptly as in *epipleuralis*. *Sternum*: metepisterna barely longer than wide. *Venter* more or less punctate at sides, the segments plurisetose on each side of middle line. *Legs*: front tarsi in ♂ with four dilated joints, the mesotibiæ hardly produced at apex. Ædeagus spatulate.

Length, 23–38 mm.; width, 8·5–13·5 mm.

KASHMIR: Songam (*C. Rost*). PUNJAB: Simla; Chamba (*C. Somers-Smith*); Kulu (*Graham Young*, *G. Babault*, and *C. Rost*); Spiti (*G. Babault*); Bashahr (*C. Rost*). UNITED PROVINCES: Garhwal (*Tytler*—Ind. Mus., *H. G. Champion*, and *C. Rost*); Mundali and Deoban Bodyar (*C. F C. Beeson* and *S. K. Pillai*), West Almora, Dudhatoli, and Sunderdhunga Valley (*H. G. Champion*).

Type in the British Museum.

19. **Carabus epipleuralis**, *Sem.*

Carabus epipleuralis, Semenow, Rev. Russ. Ent. 1906, p. 268; (?) Lapouge, Bull. Soc. Sci. Méd. Ouest, 1908, p. 169 (larva).
Imaïbius epipleuralis, Roeschke *, Deutsch. Ent. Zeitschr. 1907, pp. 546, 554, and 559.

Colour black, rather dull, especially elytra in ♀.

Head rather narrow, convex, surface slightly wrinkled in front, more coarsely on disk, neck finely coriaceous, two clypeal and two supraorbital setæ on each side.

Prothorax quadrate, slightly convex, transverse, a third as

wide again as long, half as wide again as head, base slightly and widely, apex more deeply emarginate, latter bordered, sides with a moderately thick reflexed border, slightly rounded in front and very faintly sinuate at basal third, hind angles very little less than right, a little rounded, projecting downwards and backwards, but not outwards; median line and basal transverse depression both slight, foveæ moderately deep, rounded, surface coriaceous, rather indistinctly punctate along margins, more evidently along base and in the foveæ. *Elytra* convex, elongate-ovate, widest behind middle, rather less than twice as long as wide, rather more than a third as wide again as prothorax, shoulders nearly obsolete, a fine reflexed border, distinctly sinuate behind in both sexes, apex rather gently declivous; punctate-striate, with primary, secondary, and tertiary intervals, the three primaries formed by raised lines, broken at frequent intervals by small rounded pits, each with a tubercle, secondaries and tertiaries about equal, narrower than primaries, sculpture at sides very irregular, apical third and sides finely and closely granulate-aciculate, epipleura ending very abruptly near apex. *Sternum*: metepisterna rather wider than long. *Venter* nearly smooth, with numerous setæ on each side of median line. *Legs*: front tarsi in ♂ with four dilated joints, mesotibiæ produced on inner side at apex. Ædeagus spatulate.

Length, 23–28 mm.; width, 8·5–10·5 mm.

KASHMIR: Mountains west of Pir Panjal and north of Punch, 6000–10,000 ft. (*C. Rost*).

Type in the Museum of the Academy of Sciences, Petrograd; Dr. Roeschke's type in his own collection.

Mr. Lapouge supposes that the undetermined larva described by him as No. 14 (Bull. Soc. Sci. Méd. Ouest, 1907, p. 39) is either that of this species or that of *stoliczkanus*.

20. Carabus dardiellus, *Bates*.

Carabus dardiellus, Bates *, Proc. Zool. Soc. Lond. 1889, p. 211.
Tropidocarabus opacus, Kraatz *, Deutsch. Ent. Zeitschr. 1895, p. 367; Reitter, Best. Tab. p. 95.
Imaïbius dardiellus, Roeschke, Deutsch. Ent. Zeitschr. 1907, pp. 546 and 556.

Colour black, moderately shiny in ♂, dull in ♀.

Head of moderate width, convex, eyes prominent, surface smooth in front, finely but slightly wrinkled on vertex and neck, two clypeal and two supraorbital setæ on each side. *Prothorax* cordate, moderately convex, transverse, a third as wide again as head, and as much compared with length, apex rather deeply emarginate and very clearly bordered, sides with reflexed border, moderately rounded in front and gently sinuate towards base, hind angles about right, but rounded, projecting

backwards and downwards; median line fine but clearly incised, hind transverse impression very slight, foveæ small, but clearly indicated, surface finely coriaceous, rather indistinctly punctate along margins, more clearly along base, the puncturation sometimes more dense and extending to disk. *Elytra* convex, elongate-oval, two-thirds as long again as wide, half as wide again as prothorax, shoulders rounded, a fine reflexed border, slightly sinuate behind in ♀, apex gently declivous; fully striate, the striæ rather indistinctly punctate, primary intervals broken up by a series of rounded pits, each as wide as the interval and with a minute tubercle at bottom, hardly raised above the general surface and only a little wider than the other intervals, which are of equal width, sides irregularly sculptured and with the apical third minutely tuberculate, epipleura tapering moderately at extremity. *Sternum*: metepisterna as long as wide. *Venter* generally with a few punctures at sides. *Legs*: front tarsi in ♂ with four dilated joints, mesotibiæ produced on inner side at apex. Ædeagus spatulate.

Length, 21–31 mm.; width, 7·5–10·5 mm.

KASHMIR: Gurais Valley (*J. H. Leech*—type); Radjawar (*H. Kläger*); Songam and Dusu, south-east of Islamabad (*C. Rost*); Batote, Gulmarg, and Nagmarg (*B. M. Bhatia*).

Type in Mr. René Oberthür's collection, that of *opacus* in the Deutsch. Ent. Museum.

20 *a*. **Carabus dardiellus**, *Bates*, var. **subpunctulus**, *Roesch.*

Imaïbius dardiellus, Bates, subsp. *subpunctulus*, Roeschke*, Deutsch. Ent. Zeitschr. 1907, p. 558.

The head is thicker than in the typical form, the prothorax more distinctly cordate, the sides rather more rounded in front and more sinuate behind, the hind angles more pointed; the elytral intervals are finer and clearer, the primaries hardly wider than the others, with punctures of moderate depth instead of pits, the tuberculation of the sides and apex very much less marked.

Length, 21–26 mm.; width, 7·5–9 mm.

KASHMIR: Mountains north-east of Islamabad, 6000–8000 ft. (*C. Rost*); "Kashmir" (*T. R. D. Bell*).

Type in Dr. H. Roeschke's collection.

20 *b*. **Carabus dardiellus**, *Bates*, var. **klägeri**, *Kraatz.*

Tropidocarabus klägeri, Kraatz*, Deutsch. Ent. Zeitschr. 1895, p. 368; Reitter, Best. Tab. p. 95.

Imaïbius dardiellus, Bates, subsp. *klägeri*, Roeschke, Deutsch. Ent. Zeitschr. 1907, p. 558.

Compared with the type-form the prothorax is more quadrate,

with less rounded sides and more rounded hind angles; the pits on the primary intervals are quite as large, the first flat, except at apex, the second and third distinctly raised, of varying width, secondaries a little raised as compared with tertiaries, the latter somewhat encroached upon at sides by the other intervals, the sculpturing generally more irregular, the fine tuberculation similar or slightly less.

Length, 22–31 mm.; width, 8–10 mm.

KASHMIR: Radjawar (*H. Kläger*—type); Pir Panjal, south-west of Srinagar, 6000–8000 ft. (*C. Rost*). The examples from Radjawar are much smaller (22–24 mm.) than those from Pir Panjal (25–31 mm.).

Type in the Deutsch. Ent. Museum.

20 *c*. **Carabus dardiellus**, *Bates*, var. **granulisparsus**, *Bates*.

Carabus dardiellus, Bates, var. *granulisparsus*, Bates*, Proc. Zool. Soc. Lond. 1889, p. 211.

Imaïbius dardiellus, Bates, subsp. *granulisparsus*, Roeschke, Deutsch. Ent. Zeitschr. 1907. p. 559.

The head and prothorax are rather more rugose and more distinctly punctate than in the type-form (though this applies chiefly to the Gurais Valley examples); the elytra are very clearly catenulate, the pits on the primary intervals rather larger, tertiary intervals indistinct or obsolete, secondaries tending to break up into rows of small tubercles, the whole surface minutely tuberculate, though more conspicuously at sides and apex than on disk.

Length, 22–27 mm.; width, 7·5–10 mm.

KASHMIR: Gurais Valley(*J H. Leech*—type); Pir Panjal, south-west of Srinagar, 8000–10,000 ft. (*C. Rost*); Jhelum Valley, Gulmarg, 8500 ft. (*B. M. Bhatia*).

Type in Mr. René Oberthür's collection.

Group II. CYCHRINI.

In addition to one or two genera found in North America, the group contains only the genera *Cychrus* and *Cychropsis*, the former widely spread over the palæarctic and nearctic regions, the latter confined, so far as is known at present, to Sikkim, and represented by a solitary species. The procoxal cavities are open behind, the protibiæ entire, the mesosternum vertically carinate in front, the metacoxæ separated, the mandibular scrobe and clypeus both glabrous, the labrum deeply bifurcate, the apical joint of the palpi generally widely dilated, labials with joint 2 either bi- or plurisetose, the outer obe of the maxillæ wide and partially embracing the inner

one, the elytra unbordered at base, with very wide epipleura, which largely envelop the abdomen, last ventral segment ♂ distinctly excised, body apterous.

The CYCHRINI and CARABINI are nearly related, but in the former the metacoxal cavities are separated, in the latter contiguous. The CYCHRINI also present quite a different facies, with a relatively narrow head and prothorax, and a sub-globular hind-body, much more slender antennæ and legs, and a deeply cleft labrum.

Genus **CYCHROPSIS.**

Cychropsis, Boileau, Bull. Soc. Ent. Fr. 1901, p. 350; Roeschke, Mon. Cychrini, Ann. Mus. Hung. v, 1907, p. 201.

TYPE, *Cychrus sikkimensis*, Fairm.

Head elongate, parallel behind eyes, neck unconstricted, gula glabrous, eyes small and moderately prominent, slightly enclosed behind by the genæ, distant from buccal fissure, without supraorbital pore; clypeus glabrous, the suture fine, curved, convex backwards, labrum porrect, rather inflated, deeply emarginate in front, the lobes rounded, two setæ at apex of each and two in the middle of the emargination, the underside of front margin densely setose; mandibles long, curved, and very sharp at apex, with two long sharp teeth, no seta in the scrobe; ligula short, rather sharply pointed at apex and bisetose, paraglossæ horny, adnate but extending far beyond it and curving inwards, setose at apex and on upper surface; mentum deeply emarginate, edentate; maxillæ elongate, setose to near apex, which is hooked and sharp, enveloped beneath to beyond apex by the wide outer lobe; palpi very long and slender, last joint moderately dilated (more so in ♂), flattened, slightly grooved on upper surface and rounded at apex, maxillaries with 2 nearly as long as 3 and 4 together, 4 a little longer than 3, labials with 2 half as long again as 3, slightly flattened, with 5 setæ on inner margin; antennæ long and slender, extending rather beyond middle of elytra, pubescent from joint 5, but 3 and 4 have each a few hairs on apical half, 1 clavate, bisetose, a little shorter than 3, 2 about two-thirds of 3, 4 a little shorter than 2, 5 equal to 3, and the rest gradually decreasing in length to apex. *Prothorax* cordate, rather small, the propleura clearly visible from above, a seta on each side just before middle, where the sides are almost angulate. (I have not been able to detect a seta at hind angle.) *Elytra* very convex, elongate-oval, without basal border, much contracted at extremities, margin entire behind, connate along suture, multistriate, without clearly-defined scutellary striole, scutellum short,

wide, curved behind, practically concealed by prothorax, epipleura very wide, largely enclosing the hind body. *Sternum*: prosternal process channelled on each side, apex unbordered, rounded, hardly projecting backwards beyond front coxæ, mesosternum slightly and widely channelled between coxæ, carinate in front, metepisterna very small, but long and narrow, the epimera invisible. *Venter*: the segments with 3 setæ on each side, apical segment ♂ deeply excised and with two (but in the specimen examined a single seta only on each side was visible), ♀ with three or four setæ on each side. *Legs* long and rather slender, finely spinulose; metacoxæ distinctly separated, with a seta on each side near apex, mesocoxæ and all trochanters with a single seta, mesotibiæ thickly clothed towards apex with reddish hairs; tarsi as long as tibiæ, glabrous on upper surface, joint 1 a little longer than 2 and 3 together, protarsi ♂ with joints 1–3 moderately dilated and clothed beneath with a thick hairy pad, claws smooth.

Range. Sikkim. The genus, which contains but a single species, is closely allied to the palæarctic genus *Cychrus*, differing from it in the much shorter head, wider mandibles, the palpi much less dilated at extremity, tarsi elongate, etc.

Nothing is known of the early states. In his Monograph (pp. 110 to 113) Dr. Roeschke gives a long account of the stridulatory apparatus in the Cychrini, and, as far as his researches have gone, he believes it to be always present. Sound in this group is produced by friction between minute granulations at the sides of the abdominal tergites and the file-like inner margin of the elytral epipleura.

21. Cychropsis sikkimensis, *Fairm.*

Cychrus sikkimensis, Fairmaire *, Bull. Soc. Ent. Fr. 1901, p. 265.
Cychropsis sikkimensis, Roeschke, Mon. Cychrini, Ann. Mus. Hung. v, 1907, p. 201.

Colour black; antennæ and tarsi faintly red at apex.

Head elongate, flat, rather dull, considerably dilated round base of buccal fissure, vertex depressed in middle, with a few punctures and slight wrinkles at sides. *Prothorax* cordate, moderately convex, rather dull, narrow, hardly wider than head, very little wider than long, widest rather before middle and contracted behind slightly more than in front, extremities truncate, the front angles close to neck, sides rounded and bordered in front, contracted to about a sixth from base, where there is a distinct constriction, thence widened to base, where the hind angles would be acute, but that, owing to the practical disappearance of the border, they are quite flattened; median line distinct in middle but not reaching extremities, transverse impressions deep, basal foveæ deep and elongate; surface rather coarsely and confluently punctate, rugose in the foveæ,

nearly smooth in middle of disk. *Elytra* elongate-oval, very convex, moderately shiny, a little more than twice as wide as prothorax, and a little more than half as long again as wide, widest just behind middle; 15 irregular ill-defined punctate striæ, the punctures on disk few and small, larger at sides

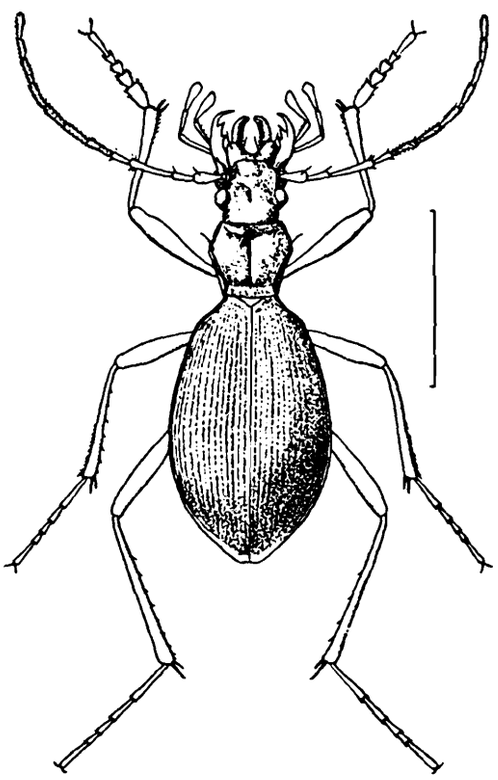


Fig. 17.—*Cychropsis sikkimensis*, Fairm., ♀.

and apex, where the sculpturing is coarse and irregular, tuberculate towards apex, the epipleura with large shallow punctures. *Sternum*: prosternum and episterna moderately punctate. *Venter* smooth, impressed at sides.

Length (with mandibles), 17–21 mm.; width, 6·5–8 mm.

SIKKIM: Gnatong and beyond Jalep.

Type in Mr. René Oberthür's collection.

Group III. OPISTHIINI.

There are two genera in the group, *Opisthius* and *Paropisthius*, confounded until lately under the former name. Each genus contains but a single species, *Opisthius richardsoni*, Kirby, being confined to North America and *Paropisthius indicus*, Chaud., to the Himalayas. *Paropisthius* bears a strong superficial likeness to the palæarctic genus *Elaphrus*, no example of which has been discovered within our limits, but in the former the procoxal cavities are open behind, and

the prosternal process extends far backwards over the mesosternum, which is vertically carinate. A seta is present in the mandibular scrobe, the elytra are not bordered at base; the apex of the front tibiæ is grooved beneath and slightly emarginate at apex, the variable spur at the base of this emargination being placed hardly further back than the fixed one;

Genus **PAROPISTHIUS.**

Opisthius, Chaudoir, Ann. Soc. Ent. Fr. 1863, p. 449; Dupuis, Gen. Ins., Fasc. 126, Opisthiinæ, 1912, p. 2.
Paropisthius, Casey, Mem. Col. ix, 1920, p. 148 (note); Bänninger, Ent. Mitt. 1925, p. 187; Semenow, Rev. Russ. Ent. 1926, p. 38.

TYPE, *Opisthius indicus*, Chaud. (North India.)

Recalling the genus *Elaphrus*, but larger, and with upper surface less strongly sculptured.

Head wide, with large prominent eyes, distant from buccal fissure, two supraorbital setæ; clypeus bisetose, suture fine, slightly arcuate, labrum transverse, contracted towards apex, sex-setose; mandibles with a seta in scrobe, curved and sharp at apex, right one with a small tooth towards base; ligula small, rectangular, strongly carinate beneath along median line, slightly pointed and bisetose at centre of apex, the narrow linear membranous paraglossæ adnate at base only, pointed at apex, and extending a little beyond ligula; mentum with rather a small emargination and a strongly bifid tooth, with sharp points, behind which at base on each side is a large pore, bearing a long seta, lobes rounded near base, then straight to near apex, which is shortly truncate, the ends of the epilobes projecting as small teeth; maxillæ slender, hooked at apex, and very sharp; palpi with last joint moderately dilated, truncate at apex, a little longer in the maxillaries than joint 3, labials elongate, joint 2 slightly longer than 3 and plurisetose on inner margin; antennæ reaching basal fourth of elytra, pubescent from joint 5, 3–4 with a few scanty hairs. *Prothorax* transverse, rather wider than head, front margin slightly dilated in middle, sides bordered and dilated in front into rounded lobes, without setæ. *Elytra* ovate, moderately convex, with unbordered base, margin uninterrupted behind, half as wide again as prothorax, without regular striæ, but each bearing three highly polished stripes, interrupted by large round shagreened spots. *Sternum*: prosternal process spatulate and projecting some little way backwards, fitting into a groove in the mesosternum; mesosternum bifurcate behind, but contracting in front of the groove to a fine bordered pubescent point, which forms the end of a vertical keel; metepisterna twice as long as wide, fused with

the epimera. *Venter* sparsely punctate at sides and pubescent, segments 3–6 (♂ ♀) with a row of hairs placed transversely near hind margin. *Legs* elongate, finely spinulose, and sparsely pubescent, metacoxæ with a few fine hairs; tarsi pubescent on upper surface, in protarsi joint 1=2+3, in the other two pairs 1=2+3+4 (very nearly), protarsi ♂ with four joints moderately dilated and clothed beneath with spongiose tissue, claws smooth.

Range. North India.

Of the life-history of these insects nothing is known at present.

In the closely allied genera *Blethisa* and *Elaphrus* there is a stridulating apparatus, but I have been unable to detect this here. Writing on the two genera mentioned, Dr. Gahan says (Trans. Ent. Soc. Lond. 1900, p. 448) that the apparatus consists of "(1) a series of very short ridges on the abdomen placed in a slightly arcuate row on each side of the posterior part of the penultimate dorsal segment; (2) a series of longitudinal striæ lying on the posterior expanded part of the epipleural ridge, which runs along the underside of each elytron." I have thought it worth while to reproduce this note here, because the genus *Elaphrus* has already been notified from Tibet, and is quite likely to turn up in some part of the Himalayas.

22. **Paropisthius indicus**, *Chaud.*

Opisthius indicus, Chaudoir *, Ann. Soc. Ent. Fr. 1863, p. 449; Dupuis, Gen. Ins., Opisthiinæ, 1912, t. ff. 1 and 8-10; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 195.

Paropisthius indicus, Casey, Mem. Col. ix, 1920, p. 148 (note).

Colour cupreous with some vague purplish patches, beneath black with metallic reflection, legs bluish or metallic green, middle of tibiæ red, antennæ with joints 1–4 blackish green, 5–11 blue.

Head shagreened, a little uneven, flat, dull, brighter near eyes, where the surface is slightly striate, front minutely and sparsely punctate, vertex with some vague shallow puncturation; antennæ with joint 1 rather short and stout, 2–4 compressed, 3 rather longer and 2 considerably shorter than the rest. *Prothorax* convex on disk, shagreened but moderately shiny, contracted a little more behind than in front, base lightly bisinuate, sides bordered, dilated in front into two rounded and reflexed lobes, sinuate, slightly in front, strongly behind, front angles acute, embracing neck, hind angles about right; median line very short but deep, transverse impressions and basal foveæ all very distinct, surface finely rugose and punctate. *Elytra* with three more or less polished stripes,

largely interrupted by rounded and shagreened spots, which vary somewhat in their position, each with a minute pore at centre, four such spots on the two inner stripes and five on the outer one, apex also shagreened, a row of smaller and vaguer but more numerous small spots along margin, the area between the stripes covered with shallow shagreened punctures.

Length, 11·5–12 mm. ; width, 4·8–5 mm.

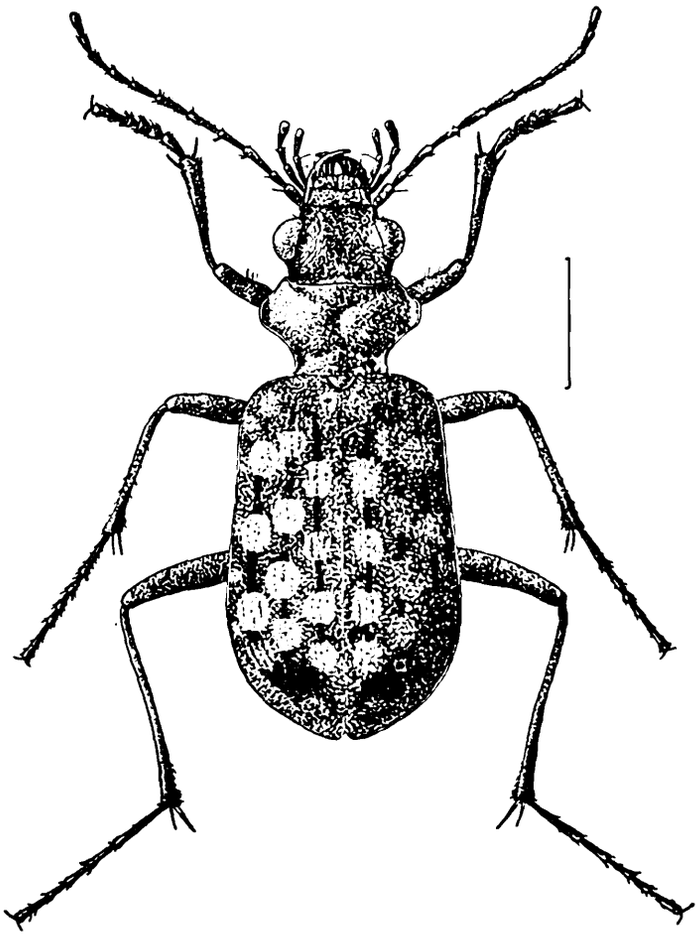


Fig. 18.—*Paropisthius indicus*, Chaud., ♂

NORTH INDIA (type). SIKKIM : Kalapokri, 9000 ft., Nepal frontier (*H. Stevens*) ; Karponang, 1000 ft. (*H. Stevens* and *R. W G. Hingston*) ; Darjiling ; Nagri Spur (Pusa Coll.) ; Mungphu (*Atkinson*) ; Khamba-Jong, 15,000–16,000 ft. ; Guentok ; Senchal, 8000 ft., and Ghoom, 7400 ft. (*S. W Kemp*—Ind. Mus.) ; Phallut, 12,000 ft., " in seed cases of lily in snow " (*C. W Beebe*—Ind. Mus.) ; Gnatong, 12,000 ft. (*R. W G. Hingston*). TIBET : Jelap-La, 13,000 ft. ; Chumbi Valley, 11,000 ft. ; Gautsa, 12,000–13,000 ft. ; Kampa Dzong, 14,500 ft. (all *R. W G. Hingston*).

Type in British Museum.

I think it exceedingly probable that this species is the *Elaphrus* referred to by Sir Joseph Hooker in his ' Himalayan Journals.'

Group IV. NEBRIINI.

This group contains but two genera found in India, viz., *Leïstus* and *Nebria*. The pro-coxal cavities are open behind, the mesosternum vertically carinate in front, the mandibles with a seta in the scrobe, the protibiæ not emarginate on the inner side, but cut away beneath at the apex, so that, although the spurs are both terminal, the variable one is placed rather further back than the fixed one, the elytra bordered at base and 9-striate.

Key to the Genera.

1 (2) Mandibles widened at base into a broad plate, maxillæ with a row of projections on outer margin, each bearing a bristle, second joint of labial palpi extremely long and thin .. .. LEÏSTUS, Fröl., p. 106.

2 (1) Mandibles not widened at base, maxillæ without projections, though provided with a row of bristles, second joint of labial palpi normal NEBRIA, Latr., p. 112.

Genus **LEÏSTUS.**

Leïstus, Frölich, Naturforscher, xxviii, 1799, p. 1; Dejean, Spec. Gen. ii, 1826, p. 212; Lacordaire, Gen. Col. i, 1854, p. 52; Reitter, Wien. Ent. Zeit. 1885, p. 213; id., Wien. Ent. Zeit. 1905, p. 209; K. Daniel, Münch. Kol. Zeitschr. i, 1903, p. 170; Bänninger, Ent. Mitt. 1925, pp. 186 and 329.
Pogonophorus, Latreille, Hist. Nat. Crust. et Ins. iii, 1802, p. 88.
Leïstophorus, Reitter, Wien. Ent. Zeit. 1905, p. 209.

TYPE, *Carabus spinibarbis*, F (Europe.)

Head wide, sharply contracted and constricted behind eyes, with a transverse row of bristles at base of mentum and a second row on gula; eyes prominent, narrowly separated from buccal fissure, with one supraorbital pore; clypeus bisetose, labrum transverse, with four large setiferous pores on upper surface (in European species sometimes with two minute additional setæ on middle of margin), but minutely setose beneath at sides; mandibles wide, concave beneath, rounded into a flat plate at sides, hooked and very sharp at apex, right one with a tooth at base; mentum short, wide, with a broad, bifid tooth in the emargination, the lobes widely rounded externally, a bristle at the apex of each and of each point of the tooth; ligula elongate, moderately wide at apex, gently contracted to middle, where the apex of the adnate paraglossæ projects on each side as a sharp point, and continued to form a trifurcate process at apex, swollen beneath and bisetose at

a point opposite the ends of the paraglossæ (this applies to Indian species only, in European species there being instead a seta on each side of the central apical prong) ; maxillæ slender, hooked and very sharp at apex, the stipes enlarged externally and bearing four or five cylindrical projections, each with an apical bristle, the squama palpigera with an even longer projection, bearing two bristles ; palpi very long and slender, slightly widened and flattened at apex, joint 2 of labials with a single seta on inner margin near base (Indian species) ; antennæ long and very slender, pubescent from joint 5, 1 a little longer than 3, twice as thick as the other joints, with a single seta near apex, 2 very short, 4 about two-thirds of 3, the rest rather longer than 1. *Prothorax* cordate, the disk convex, sides more or less explanate, a single seta placed on each side at about the widest part (sometimes wanting), no seta at hind angle, middle of front margin raised, transverse impressions deep. *Elytra* more or less oval, the margin entire behind, the scutellary striole fairly long. *Sternum* : prosternal process bordered, projecting a little way backwards, mesosternum with a short groove behind, which receives the apex of the prosternal process, metepisterna narrowed behind, rather longer than wide. *Venter* : apical segments with a single seta on each side of median line, anal segment with two on each side in ♀ *Legs* slender and finely spinulose, tarsi setose on upper surface, joint 1=2+3 approximately ; joints 1 to 3 of protarsi ♂ moderately dilated and clothed beneath with a thick hairy pad ; claws smooth. Of the four Indian species two are winged, and two apterous.

Range. Palæarctic and nearctic regions, extending southwards to North Africa and in Asia to the Himalayas and Yunnan. Walker's *Leïstus linearis* from Ceylon has nothing to do with the genus, and is identical with *Celœnephes parallelus*, Schm.-Goeb. The species are found in humid places, under stones, moss, dead leaves, etc., and many of them, including all the Indian species, are confined to mountainous regions.

Nothing is known of the life-history of the Indian species, but Schiødte has described and figured the larvæ of *L. rufomarginatus*, Duft., *L. rufescens*, F., and *L. ferrugineus*, L. (Nat. Tidsskr. 1867, p. 456, t. 15. ff. 1–12). The larva of *L. rufescens*, including the buccal organs, is also figured by Ganglbauer (Käf. Mitteleur. i, 1892, p. 27).

The Himalayan species do not show any very close relationship with those found in the palæarctic regions, which have been distributed by modern authors among numerous subgenera. They appear most nearly related to the subgenus *Leïstophorus*, and this is referred to above, but it hardly seemed to me necessary to introduce here the names of all the other subgenera.

Key to the Species.

1 (6)	Colour piceous, without any greenish tinge, base of mentum with at least 2 setæ on each side.	
2 (5)	Base of mentum with 2 setæ on each side.	
3 (4)	Mandibles normal, gradually contracting to apex, gula with 4 setæ inserted on a slight transverse ridge, prothorax bordered in front only, no carina at apex, body apterous ...	*nivium*, Andr., p. 108.
4 (3)	Mandibles abnormal, with parallel sides which only contract quite close to apex, gula with 6 setæ inserted in tubercles on a strongly-raised transverse ridge, prothorax unbordered, a carina at apex, body winged .	*championi*, Andr., p. 109.
5 (2)	Base of mentum with 3 setæ on each side, mandibles normal, gula with 8 setæ inserted in tubercles on a strongly-raised transverse ridge, prothorax bordered throughout, a carina at apex, body apterous.. ..	*kashmirensis*, Andr., [p. 110.
6 (1)	Colour piceous, with a distinct green tinge on upper surface, base of mentum with a single seta on each side, gula with 4 setæ inserted on a slight transverse ridge, prothorax bordered throughout, a carina at apex, body winged .. .	*indus*, Tchitch., p. 111.

23. Leïstus nivium, *Andr.*

Leistus nivium, Andrewes, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 312; Bänninger, Ent. Mitt. 1925, pp. 331 and 333.

Colour piceous black; mandibles, palpi, joints 2 to 11 of antennæ, apex of femora, tibiæ, and tarsi testaceous red.

Head relatively narrow, rather convex, strongly constricted behind eyes, nearly smooth and rather dull, one or two minute punctures behind eyes, clypeus and sides of front minutely rugose, clypeus truncate in front, clypeal suture fine, curved, labrum wide, rounded in front, mandibles very short in front of lateral dilatation, at base of mentum four bristles arising from minute tubercles, gula with a slight 4-setose ridge. *Prothorax* convex, considerably wider than head, about a third wider than long, widest a little before middle and about equally contracted at extremities, base truncate, apex slightly emarginate, sides moderately explanate, bordered only in front, strongly rounded in front, sinuate a little before hind angles, which are right and very sharp, a marginal seta in front, none at hind angle; median line fine but well marked

in middle, transverse impressions and basal foveæ deep, surface smooth but with some very fine transverse striæ, base and apex coarsely but sparsely punctate, explanate margin uneven rather than punctate. *Elytra* elongate-oval, moderately convex, nearly half as wide again as prothorax and quite a half longer than wide, base with well-marked border, which forms almost a tooth at its junction with side border, sides with narrow reflexed border, faintly sinuate before apex; deeply punctate-striate, the punctures not very large, the outer striæ rather faint towards apex, intervals convex, smooth, 3 with five pores, evenly distributed, no carina at apex. *Sternum*: sterna (except middle of metasternum) and episterna coarsely punctate. *Venter* coarsely punctate at base. Body apterous.

Length, 9 mm.; width, 3 mm.

KASHMIR: Dusu; Sintan Pass (*Carl Rost*).

Type (♀) in my collection.

24. Leïstus championi, *Andr.*

Leïstus championi, Andrewes, Ann. Mag. Nat. Hist. (9) v, 1920, p. 448; Bänninger, Ent. Mitt. 1925, pp. 331 and 333.

Colour piceous; mandibles, palpi, joints 2 to 11 of antennæ, margin of prothorax, and tarsi testaceous-red.

Head rather wide, moderately convex, nearly smooth on vertex, with a few fine punctures at back, behind this a deep transverse depression, sides rugose-punctate and very uneven, clypeus uneven, clypeal suture almost straight, labrum narrow, contracted in front, mandibles elongate and parallel in front of lateral dilatation, sharply contracted and curving downwards at apex, at base of mentum four bristles arising from small tubercles, gula with a raised, tubercular, 5-setose ridge. *Prothorax* convex, just wider than head, quite a half wider than long, widest a little before middle, equally contracted at extremities, base truncate, apex slightly emarginate; sides moderately explanate, unbordered, strongly rounded in front, sinuate a little before base, hind angles right, but slightly rounded, a marginal seta in front, none at hind angle; median line evident, but not deep, transverse impressions and basal foveæ deep, margins lightly and sparsely, base and apical area strongly punctate, the puncturation extending for some little distance from both ends along median line, disk very minutely and sparsely punctate. *Elytra* ovate, moderately convex, nearly half as wide again as prothorax, rather less than two-thirds longer than wide, sides almost parallel, but slightly sinuate behind shoulders, which are well marked and without tooth, and before apex; deeply punctate-striate, both striæ and punctures only a little less

deeply impressed towards apex, intervals moderately convex, smooth, apex of 4 to 8 dilated into a short carina, 3 with five evenly distributed punctures, the hindmost one at a little distance from apex. *Sternum*: sterna (except middle of metasternum) and episterna coarsely and confluently punctate. *Venter* coarsely punctate at base. Body winged.

Length, 8·78 mm.; width, 3 mm.

UNITED PROVINCES: Kumaon, West Almora Division Upper Gumti Valley (*H. G. Champion*).

Type (♀) in British Museum.

25. Leïstus kashmirensis, *Andr.*

Leïstus kashmirensis, Andrewes, Eos, iii, 1927, p. 65, f. 1.

Colour piceous-black; palpi, joints 2 to 11 of antennæ, tibiæ, and tarsi more or less ferruginous.

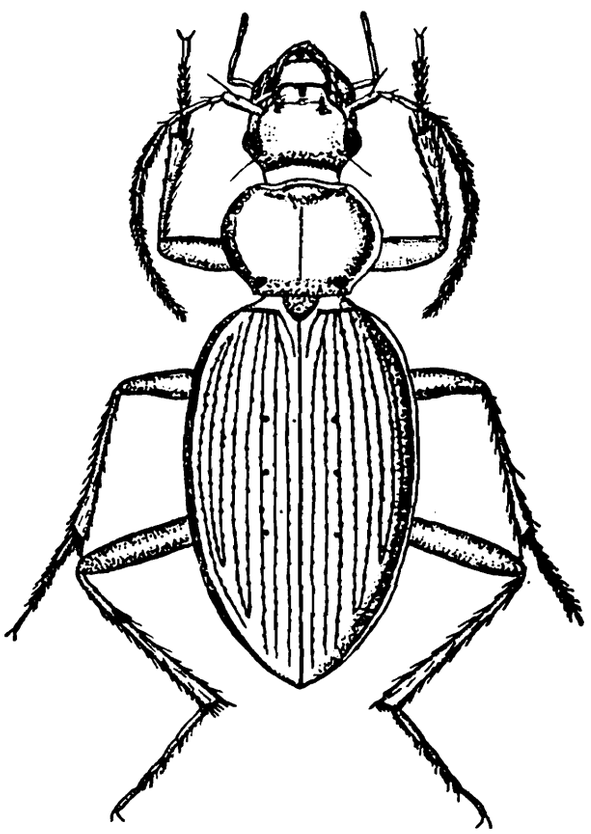


Fig. 19.—*Leïstus kashmirensis*, Andr.

Head fairly wide, strongly constricted behind eyes, practically smooth behind, some fine irregular striation at sides and in front, a few small punctures near eyes, which are moderately prominent, supraorbital pore conspicuous, placed well behind middle of eye and a little removed from it, clypeus truncate in front, longitudinally sulcate, labrum large, rounded in front,

mandibles rather short, dilated laterally, mentum with half a dozen bristles at base, gula with a strongly-raised transverse 8-setose ridge, joint 5 of antennæ quite half as long again as 3. *Prothorax* convex, a fourth wider than head and a third wider than long, a little more contracted behind than in front, base truncate, apex bisinuate, projecting somewhat forwards at middle, sides bordered, reflexed, somewhat explanate, (apparently) without lateral setæ, strongly rounded and brusquely sinuate close to hind angles, which are slightly acute and very sharp ; median line, transverse impressions, and basal foveæ all moderately deep, surface smooth, with the basal area rather coarsely punctate, a few punctures in marginal channels and along front transverse impression. *Elytra* ovate, moderately convex, a little less than a half wider than prothorax, fully two-thirds longer than wide, shoulders evident, side border reflexed, meeting basal border at an angle, which forms only a rudimentary tooth ; deeply punctate-striate, striæ less deep close to apex, intervals convex, smooth, 3 with three (sometimes four) pores, all more or less on disk. *Sternum* : episterna more or less punctate. *Venter* punctate at base. Body apterous.

Length, 9·5–10 mm. ; width, 3·3–3·5 mm.

KASHMIR : Sintan Pass (*Carl Rost*).

Type in my collection.

26. **Leïstus indus**, *Tchitch.* [Plate III. fig. 1.]

Leïstus indus, Tchitcherin, Rev. Russ. Ent. iii, 1903, p. 109; Bänninger, Ent. Mitt. 1925, p. 333.

Colour piceous black, upper surface, and more especially the elytra, with a distinct greenish hue ; palpi, joints 2 to 11 of antennæ, and tarsi testaceous ; mandibles, pro- and meso-trochanters, apex of femora, and tibiæ reddish.

Head moderately wide, rather flat, strongly constricted behind eyes, smooth but with a few minute punctures and wrinkles, uneven at sides, middle of front depressed, clypeus with some faint longitudinal striation, clypeal suture deep and straight, labrum almost semicircular, mandibles short in front of lateral dilatation, at base of mentum a bristle on each side, with some minute setæ between them, gula with a slight 4-setose ridge. *Prothorax* convex, distinctly wider than head, not quite twice as wide as long, widest a little before middle, and contracted rather more in front than behind, base moderately bisinuate, apex slightly emarginate, sides moderately explanate, with a reflexed border, narrow in front, wider behind, strongly rounded in front, sinuate close to hind angles, which are right, a marginal seta in front, none at the hind angle ; median line fine, transverse impressions and basal

foveæ deep, disk quite smooth, base, apex, and sides moderately punctate. *Elytra* elongate-oval, moderately convex, nearly half as wide again as prothorax, two-thirds longer than wide, with narrow reflexed border, shoulders evident but without tooth, sides almost parallel, faintly sinuate near apex; punctate-striate, the striæ well marked but not very deep, outer striæ rather faint towards apex, intervals only moderately convex, smooth, apex of 4 to 8 dilated into a short carina, 3 with three pores (exceptionally five) on disk, and a very indistinct one near apex. *Sternum*: sterna and episterna (except middle of proepisterna and of metasternum) punctate. *Venter* coarsely punctate at base. Body winged.

Length, 7·8–8·5 mm.; width, 3–3·2 mm.

SIKKIM: (*H. Fruhstorfer*—type); Darjiling (*R. W G. Hingston*); Ghoom, 7000–7500 ft. (*Mrs. A. S. Kemp*—Ind. Mus.); Tonglu, 10,000 ft. (*H. Stevens*).

Type in the Museum of the Academy of Sciences, Petrograd.

Genus **NEBRIA**.

Nebria, Latreille, Hist. Nat. Crust. et Ins. iii, 1802, p. 89; Dejean, Spec. Gen. ii, 1826, p. 221; Lacordaire, Gen. Col. i, 1854, p. 50; Bänninger, Kol. Rundsch. 1923, p. 129; Andrewes in Mission Babault Ind. Carab. 1924, p. 5; Bänninger, Ent. Mitt. 1925, pp. 186 and 187.

Alpæus, Bonelli, Obs. Ent. i, Mém. Acad. Sci. Turin, 1811, p. 68; K. Daniel, Münch. Kol. Zeitschr. i, 1903, p. 166; Bänninger, Ent. Mitt. 1925, p. 191.

Helobia, Stephens, Ill. Brit. Ent., Mandibulata, i, 1827, p. 60; K. Daniel, Münch. Kol. Zeitschr. i, 1903, p. 166; Bänninger, Ent. Mitt. 1925, p. 191.

Oreonebria, K. Daniel, Münch. Kol. Zeitschr. i, 1903, p. 159; Bänninger, Kol. Rundsch. 1923, p. 134; id., Ent. Mitt. 1925, p. 192.

Nebriola, K. Daniel, Münch. Kol. Zeitschr. i, 1903, p. 164; Bänninger, Ent. Mitt. 1925, p. 192.

Epinebriola, K. Daniel, Münch. Kol. Zeitschr. ii, 1904, p. 77; Bänninger, Kol. Rundsch. 1923, p. 135; id., Ent. Mitt. 1925, p. 191.

Spelæonebria, Peyerimhoff, Bull. Soc. Ent. Fr. 1911, p. 359; Bänninger, Ent. Mitt. 1925, p. 191.

Psilonebria, Andrewes, Ann. Mag. Nat. Hist. (9) xi, 1923, p. 275; Bänninger, Ent. Mitt. 1925, p. 191.

Patrobonebria, Bänninger, Kol. Rundsch. 1923, p. 131; id., Ent. Mitt. 1925, p. 192.

TYPE, *Carabus brevicollis*, F (Europe.)

Head, wide, neck thick, not contracted behind eyes, sometimes constricted, gula with at least one seta on each side, eyes moderately prominent, at some little distance from buccal fissure, with one supraorbital pore and seta; clypeus bisetose, labrum transverse, front margin sex-setose, mandibles short but strong, briefly toothed at base and hooked at apex, a seta in

the scrobe; ligula rounded in front and slightly emarginate, a carina or prominence beneath, with a seta at each side of its apex, paraglossæ adnate, not longer than ligula and fused with it; mentum with rounded lobes and a fairly deep emargination, in which there is a broad more or less emarginate tooth, a seta below each point of tooth, another on each side near middle of base, and generally yet another near each outer angle, epilobes narrow, projecting slightly at apex of lobes; maxillæ rather short, hooked and sharp at apex, the stipes provided on outer margin with four or five stiff bristles; palpi slender, not very long, the last joint widened at apex and truncate, joint 2 of labials with three setæ, more rarely with two setæ only, on inner margin; antennæ generally long, sometimes short and stout, pubescent from joint 5, joint 1 short and inflated, 2 very short, 3 equal to 5 and remaining apical joints, 4 a little shorter than 3.

Prothorax cordate, disk more or less convex, sides with two marginal setæ, more rarely with one or none, hind angles right or a little acute, front margin generally bordered at sides, transverse impressions deep.

Elytra with bordered base, sides parallel or a little dilated behind, margin entire near apex, 9-striate, with a generally well-developed scutellary striole. *Microsculpture* very distinct and not very variable, formed by a reticulation of meshes, which are isodiametric or only slightly wider than long, much finer on head and prothorax than on the elytra, but quite clear throughout.

Sternum: prosternal process projecting backwards and fitting into a groove in the mesosternum. *Venter* generally punctate at sides, the segments with from one to four setæ on each side of median line, last segment generally with one in ♂, two in ♀. *Legs* long and finely spinulose, metacoxæ with a variable number of setæ at base, tarsi glabrous or slightly setose on upper surface, joint 1 generally longer than 2 and 3 taken together, protarsi ♂ with 3, or more rarely 2, dilated joints, joint 4 of metatarsi either truncate at apex, or sometimes produced beneath. Body winged or apterous.

Range. Palæarctic and nearctic regions, extending southwards to the southern littoral of the Mediterranean, to the Himalayas, and to Yunnan. The species are numerous, and the habitat is usually a moist one, frequently near running water, sometimes in mountainous regions (including all the Indian species) and often at very great altitudes.

The life-history of the Indian species is quite unknown, but Schiødte (Nat. Tidsskr. 1867, p. 465, t. 16. f. 13) has described the larva of *N livida*, L., and some other larvæ have been described by other authors.

All the subgenera of modern authors have been included

above, as it seemed desirable to put the references on record here, but the Indian species do not fit into them very successfully, and consequently, although of course account is taken of the characters on which they are founded, they have not been used here.

Key to the Species.

1	(2)	Tarsi evidently, though not closely, pubescent on upper surface. Colour testaceous, with or without a dark apical spot on the elytra. Length about 11 mm.	*cameroni*, Andr., p. 116.
2	(1)	Tarsi glabrous. or with only a few minute hairs on upper surface. Colour of at least the elytra more or less black or piceous.	
3	(26)	Winged species, with shoulders of elytra at least moderately prominent, elytra with a generally well-developed apical carina.	
4	(19)	Labial palpi with joint 2 trisetose, neck unconstricted, a scutellary pore present, protarsi ♂ with 3 dilated joints, metacoxæ unisetose at base (*limbigera* exceptionally with 2 setæ).	
5	(12)	Elytra separately rounded and blunt at apex.	
6	(7)	Elytra with the margin broadly testaceous, interval 3 with 1 to 3 pores on apical half. Length about 13 mm...	*psammophila*, Solsky, [p. 118.
7	(6)	Elytra with at most a pale border, interval 3 without pores.	
8	(9)	Elytra about a half longer than wide, lateral setæ at base of mentum present, ventral segments with a single seta on each side. Length about 11·5 mm..	*aborana*, Andr., p. 119.
9	(8)	Elytra nearly twice as long as wide, lateral setæ at base of mentum wanting, ventral segments with from 2 to 4 setæ on each side. Length about 14 mm.	
10	(11)	Elytral striæ only moderately deep, with inconspicuous punctures, prothorax and border of elytra testaceous	[p. 120. *limbigera*, Solsky, .
11	(10)	Elytral striæ deep, with conspicuous punctures, prothorax (except border in front), and elytra (except border at apex) piceous . . .	*limbigera*, Solsky, var. *babaulti*, Andr., p. 121.
12	(5)	Elytra pointed at apex.	
13	(18)	Elytra with the pointed apex produced, with narrow flavous border. Length about 12 mm.	
14	(15)	Colour of prothorax pale	*xanthacra*, Chaud., var. *apicalis*, Breit, p. 123.

15 (14) Colour of prothorax dark. [p. 122.
16 (17) Colour of prothorax brown — *xanthacra*, Chaud.,
17 (16) Colour of prothorax black — *xanthacra*, Chaud., var. *nigricollis*, Andr., p. 123.

18 (13) Elytra with the pointed apex not produced, with wide flavous border. Length about 11·5 mm... .. — *cinctella*, Andr., p. 124.

19 (4) Labial palpi with joint 2 bisetose, neck more or less constricted, protarsi ♂ with 2 dilated joints, metacoxæ plurisetose at base.

20 (21) Elytra evidently dilated behind, two red spots between eyes, legs piceous. Length 13·5 mm. .... .. — *elegans*, Andr., p. 124.

21 (20) Elytra with the sides parallel or only slightly dilated behind. Length about 15 mm.

22 (25) Head with two red spots between eyes, frontal foveæ very finely and irregularly striate. [p. 125.
23 (24) Legs piceous . — *himalayica*, Bates,
24 (23) Legs flavous . — *himalayica*, Bates, var. *pallidipes*, Breit, p. 126.

25 (22) Head without red spots between the eyes, frontal foveæ finely punctate . — *desgodinsi*, Oberth., [p. 127.

26 (3) Apterous species with the shoulders of elytra more or less oblique, rarely with pores on interval 3 or with an apical carina, joint 4 of metatarsi more or less produced beneath at apex.

27 (34) Joints 2 and 3 of antennæ not laterally compressed near base, form of tarsal joints normal, at least the front lateral seta present on prothorax.

28 (33) Antennæ long and slender, ventral segments with 3 or 4 setæ on each side, upper surface black or piceous.

29 (32) Head without red spots, joint 2 of labial palpi trisetose, elytra without pores on interval 3.

30 (31) Elytra dilated behind, a short but distinct apical carina present, a seta at basal angle of prothorax, metacoxæ unisetose at base. Length 12·5 mm.. .. .. — *masrina*, Andr., p. 128.

31 (30) Elytra regularly oval, apical carina rudimentary, (?) no seta at basal angle of prothorax, metacoxæ bisetose at base. Length 10 mm... . — *barbata*, sp. nov., p. 130.

32 (29) Head with two red spots, joint 2 of labial palpi bisetose, elytra with 2 or 3 pores on interval 3, no apical carina, (?) no seta at basal angle of prothorax. Length 12·5 mm. [p. 131. — *pindarica*, Andr.,

33 (28) Antennæ short and stout, ventral segments with a single seta on each side, no apical carina, upper surface largely flavous. Length 10 mm. .. *pharina*, sp. nov., [p. 132.

34 (27) Joints 2 and 3 of antennæ laterally compressed near base, tarsal joints submoniliform, no lateral setæ on prothorax, joint 2 of labial palpi bisetose, no apical carina. Length 11 mm. *superna*, Andr., p. 133.

27 **Nebria cameroni**, *Andr.*

Nebria cameroni, Andrewes, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 309; Bänninger, Ent. Mitt. 1925, pp. 273 and 341.

Colour testaceous-red: palpi, joints 1 to 4 of antennæ, and legs (except tarsi) flavous; a vague triangular spot towards

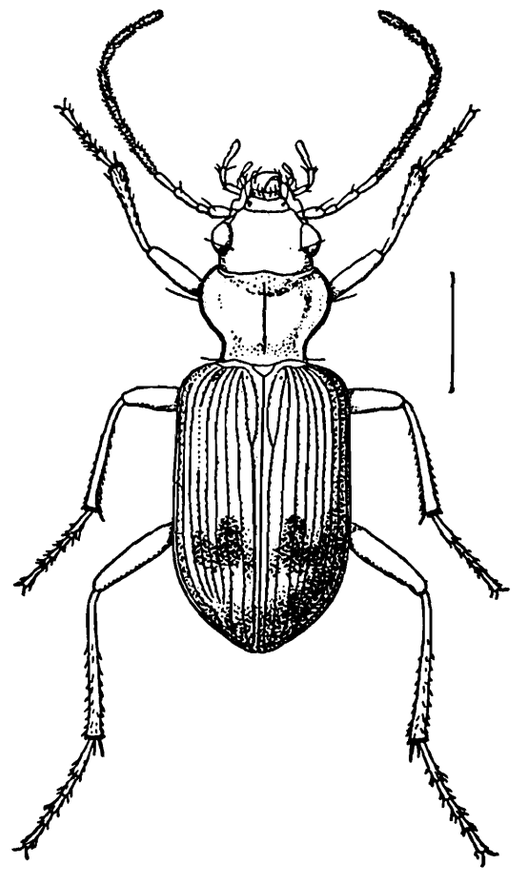


Fig. 20.—*Nebria cameroni*, Andr.

apex of each elytron, approximately from stria 2 to 7 (sometimes wanting), and a large patch on the underside, including meso- and metasternum, with their episterna, base of ventral surface (narrowly), and meso- and metacoxæ black.

Head flat, wide, and dull, neck inflated, with hardly a trace of constriction, smooth, a few fine striæ near eyes, frontal

foveæ very shallow, clypeus slightly emarginate, finely rugose, clypeal suture very fine ; gula with a row of four setæ on each side ; mentum with a deeply notched tooth, joint 2 of labial palpi trisetose, antennæ stout, hardly reaching middle of elytra. *Prothorax* cordate, moderately convex, much wider than head, nearly a half wider than long, widest rather before middle, base bisinuate, a little narrower than apex, which is distinctly emarginate, sides bisetose, a little explanate, with a narrow reflexed border, darker than disk, strongly rounded in front, sharply contracted behind, sinuate at a fifth from base, front angles slightly rounded, adjoining neck, hind angles acute and projecting laterally ; median line fine, transverse impressions and basal foveæ all fairly deep, the foveæ curved and produced a little on to disk, where they diverge somewhat, apical and side margins finely, base rather rugosely punctate, the disk smooth but dull. *Elytra* rather flat, short, and wide, with square shoulders, about half as wide again as prothorax, and rather more than half as long again as wide, sharp and not separately rounded at apex ; sides parallel, with narrow hardly reflexed border, very faintly sinuate behind shoulder and near apex ; deeply punctate-striate, the striæ not effaced behind, intervals smooth, shiny, and moderately convex, the apex of 4 to 8 raised into a short carina, 1 with a pore at base, 3 with two (sometimes three) pores, not far apart and about a third from apex. *Sternum* : metepisterna half as long again as wide, coarsely punctate. *Venter* : the segments with a single seta on each side, anal segment (♂ ♀) with two setæ on each side. *Legs* : tarsi rather strongly pubescent on upper surface, protarsi ♂ with 3 dilated joints, metatarsi with joint 4 very slightly produced at apex, metacoxæ punctate, unisetose at base. Body winged.

Length, 10·5–11 mm. ; width, 4·3–4·5 mm.

United Provinces : Mussoorie, Rajpur, Arni Gad (*M. Cameron*—type) ; Dehra Dun (*M. Cameron* and *S. N. Chatterjee*) ; Siwalik Hills, Mohan Rau (*M. Cameron*) (all Forest Res. Inst.) ; West Almora (*H. G. Champion*).

Type in the British Museum.

This species, which appears somewhat rare, is widely different in appearance from any other known at present from India. It seems most nearly allied to the South European *N testacea*, Oliv., though in colour and pattern it bears a strong resemblance to *N pulcherrima*, Bates, from China and Japan, and its variety *N pulchrior*, Maindr., from Yunnan. The black spot on the elytra is generally distinct, though sometimes obsolescent.

28. Nebria psammophila, *Solsky*.

Nebria psammophila, Solsky* in Fedchenko's Turkestan ii, part 5, 1874, p. 12; Bates, Scientific Results of Second Yarkand Mission, 1891, Col. p. 2; Glasunow, Hor. Soc. Ent. Ross. xxxv, 1902, p. 478, t. 2. f. 1; Bänninger, Kol. Rundsch. 1923, p. 139; id., Ent. Mitt. 1925, p. 195; Andrewes, Trans. Ent. Soc. Lond. 1928, p. 21.

Colour testaceous; head with buccal organs and disk of prothorax faintly reddish; elytra black, except border and apex; meso- and metasterna, their episterna, and metacoxæ piceous.

Head flat, wide, dull, smooth, neck without constriction, clypeus and sides of front vaguely wrinkled, frontal foveæ extremely shallow, clypeus slightly emarginate, clypeal suture very fine; a pair of setæ (sometimes 3 setæ) on each side of gula near buccal fissure; joint 2 of labial palpi trisetose, antennæ stout, reaching middle of elytra. *Prothorax* cordate, with convex disk, a little wider than head and about a fifth wider than long, widest rather before middle, base strongly bisinuate, a little narrower than apex, sides bisetose with a narrow reflexed border, the front pore not indenting the outline, well rounded in front, sinuate rather before base, front angles advanced but rounded, close to neck, hind angles right; median line fine, transverse impressions and basal foveæ all deep, disk practically smooth, dull, with a few faint transverse wrinkles, a few punctures along margins. *Elytra* rather flat, a half wider than prothorax and three-fourths longer than wide, slightly dilated behind, with square shoulders, sides with a narrow reflexed border, faintly sinuate behind shoulder and again near apex; fairly deeply punctate-striate, striæ a little shallower towards apex, intervals smooth and not very shiny, moderately convex near base, flat behind, where 4 to 8 are raised to form a short carina, 1 with a pore at base, 3 with two small adjacent pores behind apical third; testaceous border reaching stria 7 at base, but gradually contracting to 8 at apical third, enlarged at apex to more than twice the width at apical third. The microsculpture is unusually distinct, and formed by isodiametric meshes; on the head the meshes are much finer and almost form a microscopic granulation. *Sternum*: metepisterna a half longer than wide, subpunctate. *Venter*: the segments usually with 2 setæ on each side of median line. *Legs*: tarsi glabrous above, protarsi ♂ with 3 dilated joints, metatarsi with joint 4 produced beneath; base of metacoxæ unisetose. Body winged.

Length, 11–14·5 mm.; width, 4·25–5 mm.

KASHMIR: Kargil (*F. Stoliczka*); Sonemerg, 8600 ft. (*T. R. D. Bell*); Ganderbal, 5500 ft.; Achibal, 5600 ft. (*T. B. Fletcher*); Jhelam Valley, 5000 ft. (*H. T. Pease*). TURKESTAN:

Kokand (*Fedchenko*—type); Maracand and Ferghana up to 6000 ft.

Type in the Moscow University Museum.

In the Indian Museum there is a much discoloured example labelled "Nepal, Chitlong," which appears to belong to this species.

29. Nebria aborana, *Andr.*

Nebria aborana, Andrewes, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 310; Bänninger, Ent. Mitt. 1925, p. 194.

Colour black: front of head (above and beneath), palpi, and antennæ ferruginous; epipleura and apical border of elytra, venter, and legs (knees and tarsi darker) testaceous.

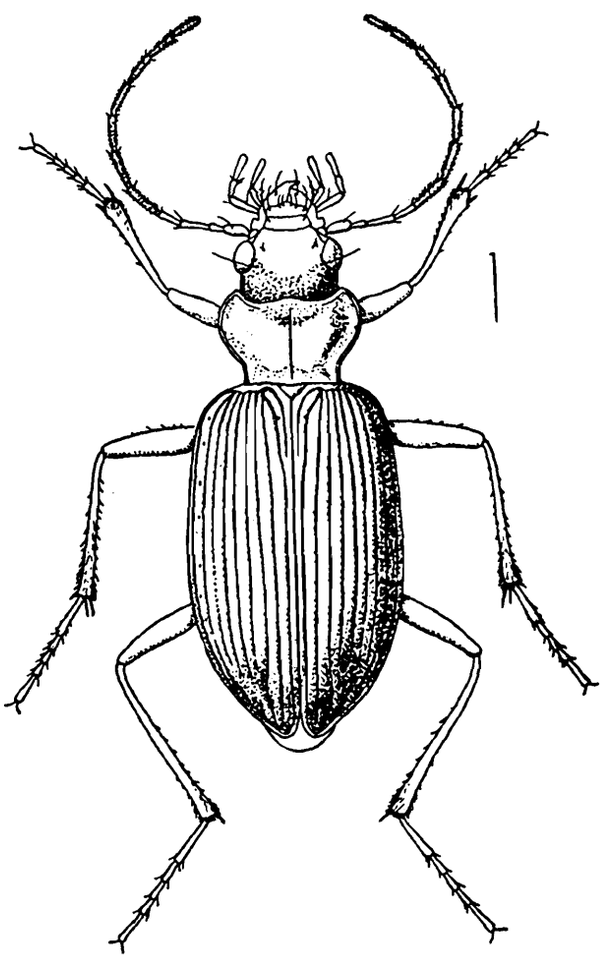


Fig 21.—*Nebria aborana*, Andr.

Head wide, smooth, not contracted or constricted behind, finely striate near eyes, a few punctures at sides behind, clypeus truncate, clypeal suture fine, frontal foveæ shallow; tooth of mentum clearly notched, gula with a row of 4 setæ on each side, joint 2 of labial palpi trisetose, antennæ slender,

reaching middle of elytra. *Prothorax* cordate, convex, a third wider than head, and fully as much wider than long, base bisinuate, as wide as apex, sides bisetose, rather widely explanate, border narrow and very little reflexed, strongly rounded in front, then sharply contracted, sinuate at some distance from hind angles, which are slightly acute and project a little laterally; median line fine, transverse impressions deep, basal foveæ both long and deep, disk smooth, the impressions, sides, and base finely punctate. *Elytra* short and wide, with square shoulders, separately but sharply rounded at apex, barely a half wider than prothorax, rather more than a half longer than wide, sides very gently rounded, narrowly bordered; striæ deep and finely crenulate, not much shallower behind, striole long, intervals smooth and convex, 1 with a pore at base, 3 without pores, apical carina not much raised, microsculpture formed by a reticulation of moderately transverse meshes. *Sternum*: metepisterna coarsely punctate, a half longer than wide. *Venter*: the segments with a single seta on each side, apical segment ♀ with 2 setæ on each side. *Legs*: tarsi with a few minute, scattered hairs on upper surface, protarsi ♂ with 3 dilated joints, joint 4 of metatarsi slightly produced beneath, metacoxæ unisetose at base. Body winged.

Length, 11–12 mm.; width, 4·5–5·25 mm.

ASSAM: Naga Hills, 4000 ft. (*S. N Chatterjee*—For. Res. Inst.); Banks of Dihang River, Janakmukh, 600 ft. (*S. W. Kemp*, Abor expedition, Ind. Mus.).

Type in the British Museum.

Closely allied to the Chinese group:—*pulcherrima*, Bates; *pulchrior*, Maindr.; *bourderyi*, Maindr. In colour it is very different from all of them, and another striking difference lies in the length and depth of the basal foveæ of the prothorax. Compared with *pulcherrima* the head is narrower, the prothorax more strongly rounded in front and sinuate behind, the elytra a little more deeply striate, the outer striæ, especially 5 to 7, being evidently deeper.

30. Nebria limbigera, *Solsky*.

Nebria limbigera, Solsky *, in Fedchenko's Turkestan ii, part 5, 1874, p. 13; Fairmaire, Ann. Soc. Ent. Fr. 1889, p. 6; Bates, Scientific Results of Second Yarkand Mission, 1891, Col. p. 3; Glasunow, Hor. Soc. Ent. Ross. xxxv, 1902, p. 481, t. 2. f. 6; Andrewes in Mission Babault Ind. Carab. 1924, p. 5; Bänninger, Ent. Mitt. 1925, p. 256; Andrewes, Ent. Month. Mag. 1926, p. 66; id., Trans. Ent. Soc. Lond. 1928, p. 21.

Colour dark testaceous, underside piceous; femora, tibiæ, epipleura of prothorax and elytra (sometimes also greater part of prosternum), and apex of venter a rather lighter red, elytra black with the border and apex narrowly red.

Head flat, moderately wide, rather dull, smooth, neck unconstricted, frontal foveæ moderately deep and a little rugose, clypeus faintly emarginate, clypeal suture fine; gula with a pair of setæ on each side, the outer seta on each side at base of mentum missing, joint 2 of labial palpi trisetose, antennæ stout, reaching middle of elytra. *Prothorax* cordate, disk moderately convex, somewhat wider than head and a fourth wider than long, widest rather before middle, base truncate but sinuate close to angles, a little narrower than apex, sides bisetose, with a narrow reflexed border, moderately rounded in front, sinuate a little before base, front angles slightly advanced and rounded, hind angles right; median line rather fine, deeper close to base, transverse impressions strongly marked, basal foveæ continued forward on to disk and generally ending in a small rounded depression, disk smooth, base, apex, and marginal channel very lightly punctate. *Elytra* rather convex, elongate, very slightly dilated behind, shoulders square, half as wide again as prothorax, a little less than twice as long as wide, a narrow reflexed border, slightly sinuate behind shoulder and again near apex; moderately deeply punctate-striate, the striæ hardly shallower near apex, the punctures inconspicuous, intervals smooth and shiny, very little convex even near base, apex of 4 to 8 raised into a slight carina, 1 with a pore at base, 3 without pores (rarely with a single pore). *Sternum*: metepisterna a half longer than wide, subpunctate. *Venter*: the segments with 2 to 4 setæ on each side. *Legs*: tarsi glabrous above, protarsi ♂ with 3 dilated joints, joint 4 of metatarsi produced at apex, metacoxæ with a single seta at base. Body winged.

Length, 13–15 mm.; width, 4·75–5·5 mm.

KASHMIR: Kargil (*F. Stoliczka*): Mulbeck, Rukshu, Nima-Mud, and Tsho-Morari (*G. Babault*). PUNJAB: Lahul, Zingzinbar (*G. Babault*). KUMAON: Shel-shel (*H. G. Champion*). TURKESTAN: Kokand (*Fedchenko*—type); Alai Mountains. PAMIR. CHINA: Moupin (*A. David*).

Type in the Moscow University Museum.

30 *a*. **Nebria limbigera**, *Solsky*, var. **babaulti**, *Andr.*

Nebria babaulti, Andrewes in Mission Babault Ind. Carab. 1924, p. 67, t. 1. f. 1; Bänninger, Ent. Mitt. 1925, pp. 257 and 281.

When describing this form I compared it with *psammophila*, but, as Mr. Bänninger has pointed out in his recent work on the Nebriini, it is more nearly related to *limbigera* and can hardly be considered as more than a variety of that species.

The colour is much darker, the reddish-brown tint being confined to the palpi, antennæ, head, margin of prothorax in

front, and border of elytra at apex. The elytral striæ are deeper, with more conspicuous punctures, and the intervals more convex, especially at sides, the metepisterna with only a few very fine punctures.

Length, 13–14·5 mm.; width, 4·75–5 mm.

KASHMIR: Baltal (type) and Mulbeck (*G. Babault*).

Type in my collection.

31. Nebria xanthacra, *Chaud.*

Nebria xanthacra, Chaudoir *, Bull. Mosc. 1850, i, p. 423; Bänninger, Kol. Rundsch. 1923, p. 140; id., Ent. Mitt. 1925, p. 195.

Colour black; joints 1 to 4 of antennæ, palpi, apex of elytra (rather narrowly), apex of venter, and legs flavous; head, including mandibles, and sides of prothorax (narrowly) dark red, the disk of latter brown; joints 5 to 11 of antennæ fuscous.

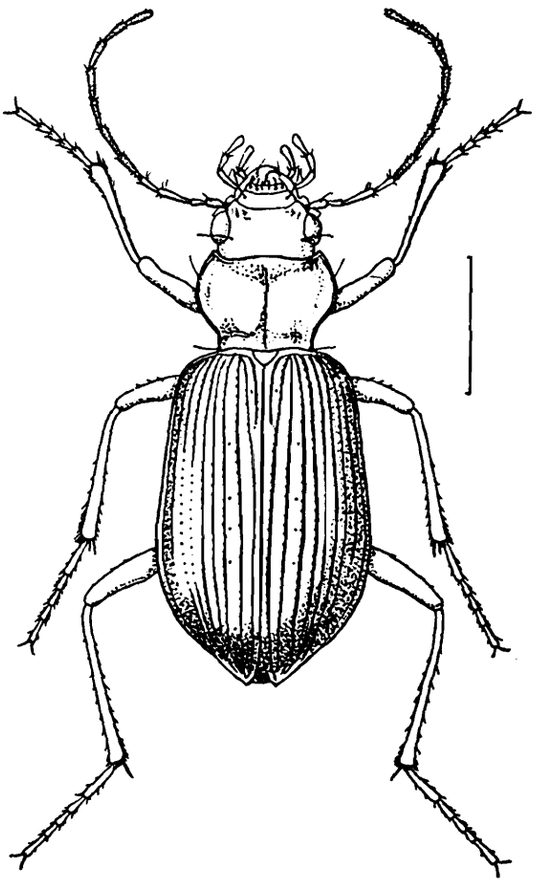


Fig. 22.—*Nebria xanthacra*, Chaud.

Head flat, wide, and rather dull, neck with hardly a trace of constriction, smooth, faintly striate in front, frontal foveæ very shallow, a slight median depression between them, clypeus emarginate, clypeal suture fine, but clearly indicated by its dark colour; gula with a pair of setæ on each side close to buccal

fissure, tooth of mentum distinctly emarginate, joint 2 of labial palpi trisetose, antennæ moderately stout and long, reaching middle of elytra. *Prothorax* cordate, distinctly wider than head, rather more than a third wider than long, widest at a third from apex, base bisinuate, rather narrower than apex, which is faintly though widely emarginate, bordered at sides more than halfway to median line, sides bisetose, with a narrow slightly reflexed border, moderately rounded in front, sinuate some little way before base, hind angles sharply right; median line shallow, transverse impressions deep, disk smooth, rather dull, with a few fine wrinkles, margins finely rugose-punctate, base with some coarser punctures. *Elytra* rather flat, short, and wide, with square shoulders, the apex of each produced into a very sharp tooth, more than half as wide again as prothorax, about half as long again as wide; sides nearly parallel, with narrow hardly reflexed border, a little sinuate behind shoulder and again near apex; fairly deeply punctate-striate, both striæ and punctures fainter towards apex, intervals smooth, not very shiny, moderately convex near base, flat near apex, where 4 to 8 are raised in the form of a short carina, 1 with a pore at base, 3 with three setiferous pores (sometimes more, sometimes less) on apical half. *Sternum*: metepisterna about a half longer than wide, moderately punctate. *Venter* with one or two setæ on each side of segments. *Legs*: tarsi with traces only of fine hairs at apex of joints, protarsi ♂ with 3 dilated joints, joint 4 of metatarsi not produced beneath, metacoxæ unisetose at base. Body winged.

Length, 11–13·5 mm.; width, 4·6–5 mm.

UNITED PROVINCES: Kumaon, Bhowali, 6000 ft. (For. Res. Inst.); West Almora, Ranikhet, and Naini Tal (*H. G. Champion*); Dehra Dun (*M. Cameron*—For. Res. Inst.). PUNJAB: Simla (*Capt. Boys* and *E. C. Ansorge*); Matiana, 8000 ft. (*N Annandale*—Ind. Mus.); Bashahr, Sangla (*R. N Parker*).

Type in Mr. René Oberthür's collection.

31 *a*. **Nebria xanthacra**, *Chaud.*, var. **apicalis**, *Breit*, Col. Rundsch. 1914, p. 160.

The variety differs from the type-form only in having the whole upper surface of the prothorax yellow-red. It was described from a specimen captured at Poo in Bashahr, but is not uncommon elsewhere.

31 *b*. **Nebria xanthacra**, *Chaud.*, var. **nigricollis**, *Andrewes*, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 312; Bänninger, Ent. Mitt. 1925, pp. 195 and 341.

Another colour variety, in which the prothorax is entirely black—also quite a common form in the districts where the species is found.

32. **Nebria cinctella**, *Andr.*

Nebria cinctella, Andrewes, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 311 ; Bänninger, Ent. Mitt. 1925, p. 195.

Colour flavous, tarsi and apical joints of antennæ a little darker ; elytra black and rather shiny, with border to stria 8 and the apex (widely) flavous ; a considerable black area on the underside, including base of prosterum, meso- and meta-sterna, with their episterna, coxæ, and base of venter.

Head wide and rather flat, neck without or with very slight constriction, surface smooth, frontal foveæ shallow, clypeal suture fine ; gula with two setæ on each side, tooth of mentum clearly emarginate, joint 2 of labial palpi trisetose, antennæ slender, reaching middle of elytra. *Prothorax* cordate, moderately convex, rather wider than head and a third wider than long, base bisinuate, a little narrower than apex, sides bisetose, with a narrow, slightly reflexed border, moderately rounded in front and sinuate at some little distance from base, hind angles right and sharp ; median line fine, transverse impressions deep, surface smooth on disk, margins finely rugose-punctate, basal area more coarsely punctate. *Elytra* short and wide, with square shoulders, more than a half wider than prothorax, about a half longer than wide, border barely sinuate either at sides or behind, slightly dehiscent at apex, each one very sharp (but not produced as in *xanthacra*) ; striæ deep and deeply punctate, striole long, intervals smooth and rather shiny, the carina at apex not at all sharp, 1 with a pore at base, 3 with one or two small pores near apex. Microsculpture formed by meshes twice as wide as long. *Sternum* : metepisterna coarsely punctate, a half longer than wide. *Venter* : the segments with 1 or 2 setæ on each side. *Legs* : tarsi almost glabrous above, though minute hairs are present at least on joint 1, protarsi ♂ with 3 dilated joints, joint 4 of metatarsi not produced beneath, metacoxæ unisetose at base. Body winged.

Length : 11–12 mm. ; width, 4·75–5 mm.

UNITED PROVINCES : Dehra Dun, Mothronwala (*M. Cameron*).

Type in the British Museum.

33. **Nebria elegans**, *Andr.*

Nebria elegans, Andrewes, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 306 ; Bänninger, Ent. Mitt. 1925, p. 193.

Nebria himalayica, Bänninger (*not* Bates), Kol. Rundsch. 1923, pp. 131 and 138.

Colour black, with two widely separated red spots on the head ; palpi brown, antennæ, mandibles, trochanters, and tarsi piceous.

Head flat, wide, moderately shiny, with a rather deep

constriction behind the eyes, surface minutely and sparsely punctulate, some fine longitudinal striæ at sides, frontal foveæ shallow, finely, closely, and irregularly striate, with a few fine punctures, clypeus slightly emarginate, uneven in front, clypeal suture fine but distinct; gula with a transverse row of setæ on each side, mentum with a broad, faintly notched tooth, joint 2 of labial palpi bisetose, antennæ rather slender, reaching middle of elytra. *Prothorax* cordate, moderately convex, not much wider than head, about a fifth wider than long, widest at a fourth from apex, extremities truncate, base bending backwards and apex forwards at sides close to the angles, base distinctly narrower than apex, sides bisetose, with a narrow but strongly reflexed border, the front lateral pore causing a break in the outline, strongly rounded in front, sharply contracted behind, and sinuate just before hind angles, which project a little outwards and backwards and are consequently slightly acute, front angles a little advanced but rounded; median line shallow, extending between the two transverse impressions, which with the basal foveæ are deep; disk smooth, sides minutely striate-punctate, moderately punctate along the course of the transverse impressions, and in the foveæ and lateral channels. *Elytra* elongate-ovate, moderately convex, evidently dilated behind, with sloping shoulders, quite half as wide again as prothorax, three-fourths longer than wide, widest at two-fifths from apex, a narrow reflexed border, slightly emarginate behind shoulder and again before apex; fairly deeply punctate-striate both striæ and punctures fainter on apical third, intervals smooth, moderately convex in front, flat behind, apex of 4 to 8 only faintly raised, 1 without pore at base, 3 with about half a dozen setiferous pores adjoining stria 3. *Sternum*: metepisterna half as long again as wide, moderately punctate. *Venter*: the segments with 2 to 4 setæ on each side of median line, apical segment ♂ with 1 marginal seta, ♀ with 2 setæ on each side. *Legs*: tarsi glabrous on upper surface, protarsi ♂ with two dilated joints, joint 4 of metatarsi produced beneath, metacoxæ plurisetose at base. Body winged.

Length, 12–15 mm.; width, 4·25–5·25 mm.

UNITED PROVINCES: West Almora Division, Sunderdhunga Valley, 8000–12,000 ft. (*H. G. Champion*).

Type in the British Museum.

34. Nebria himalayica, *Bates*.

Nebria himalayica, Bates *, Proc. Zool. Soc. Lond. 1889, p. 212; Bänninger, Kol. Rundsch. 1923, p. 138; id., Ent. Mitt. 1925, p. 193.

Nebria macrocephala, Breit * (not Motch.), Col. Rundsch. 1914, p. 158.

Nebria pallidipes, Breit, Col. Rundsch, 1914, p. 158, var. *macrocephala*, Bänninger, Kol. Rundsch. 1923, p. 131; id., Ent. Mitt. 1925, p. 193; Andrewes, Ent. Month. Mag. 1926, p. 66.
Nebria thibetica, Csiki, Col. Cat., part 92, Carabidæ: Carabinæ (ii), 1927, p. 356.

The connexion with *elegans* is very close, but the form of the elytra permits at once of a separation of the two species. In *himalayica* the surface of the head is smoother, the neck more inflated and much less constricted. The prothorax is very similar, but the front transverse impression is deeper, the front angles are less rounded, and both margins and impressions are more finely and a little more distinctly punctate. The chief difference, however, is in the form of the elytra, which are parallel-sided, with square shoulders; the intervals are rather more convex and are more clearly defined at apex, where there is a short but distinct ridge, instead of a vague one, and where the border on each side is more deeply emarginate. The small scutellary pore on interval 1 may be present or absent.

Length, 12–17 mm.

KASHMIR: Gurais Valley and Skardo (*J. H. Leech*). PUNJAB: Bashahr State, Poo; Kulu, Parbatti Valley, 6000–8000 ft. (*H. G. Champion*). UNITED PROVINCES: Almora, Milam in the Gori Valley, 11,500 ft. (*H. G. Champion*); Chakrata Division, Khedar Khud (*S. N Chatterjee*).

Type in Mr. René Oberthür's collection, that of *pallidipes* var. *thibetica* in Mr. Breit's collection.

Though extremely probable, it is not quite certain that the two species referred to above are identical, and, until a comparison of typical specimens can be made, some slight doubt must remain. I have in my collection a cotype of *macrocephala*, Breit; this I have compared with the notes I made at Rennes on the type of *himalayica* some years ago, but without discovering any means of discriminating them. Bates gives the length of his specimens as 12–15 mm., whereas Breit gives measurements of 16–17 mm.; I have not seen any specimen, other than the type, quite so short as 12 mm., but my own examples vary from 14 to 17 mm., so that the difference in size does not appear to be a very vital character.

34*a*. **Nebria himalayica**, *Bates*, var. **pallidipes**, *Breit*, Col. Rundsch. 1914, p. 158.

The name was given to a specimen with pale legs and antennæ and examples in my collection are more or less brown on the underside. These seem to me to be merely indications of immaturity.

35. Nebria desgodinsi, *Oberth.*

Nebria desgodinsi, Oberthür, Col. Nov. i, 1883, p. 47; Bänninger, Kol. Rundsch. 1923, p. 131; id., Ent. Mitt. 1925, p. 193.

Colour black, the head without red spots between the eyes; palpi, joints 1 to 4 of antennæ, and legs flavous; joints 5–11 of antennæ and mandibles dark brown.

Head wide, rather flat, not very shiny, slightly constricted behind eyes, nearly smooth on disk, finely punctate at sides and back and in the shallow frontal foveæ, clypeus slightly

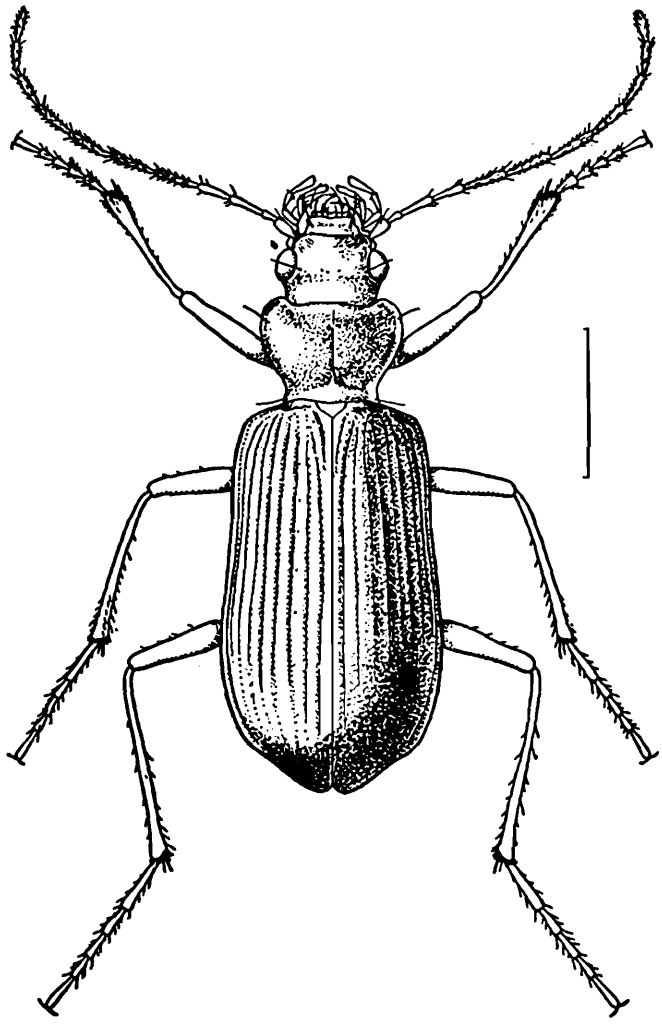


Fig. 23—*Nebria desgodinsi*, Oberth.

emarginate, uneven in front, clypeal suture distinct; gula with a pair of setæ on each side near middle just behind suture of mentum, a second pair close to buccal fissure, mentum with only a slight notch at apex of tooth, joint 2 of labial palpi with only two setæ on inner margin, antennæ long and rather stout, reaching middle of elytra. *Prothorax* cordate, disk moderately convex, not very much wider than head, about a

fifth wider than long, widest at a third from apex, base bisinuate, narrower than apex, which is widely but not deeply emarginate, sides bisetose, with reflexed border, a slight but distinct break in outline caused by front marginal pore, strongly rounded in front, sinuate some little way before base, hind angles sharply right; median line rather shallow, transverse impressions deep, disk slightly wrinkled, very finely and sparsely punctate, base, marginal channels, and apex more coarsely punctate. *Elytra* moderately convex, narrow and very elongate, with rather square shoulders, half as wide again as prothorax, and nearly twice as long as wide, sides nearly parallel, with reflexed border, slightly sinuate behind shoulders and again before apex; punctate-striate, the striæ not very deep, evanescent towards apex, intervals smooth, nearly flat but more convex at sides, a very short carina at apex, 1 with a pore at base, 3 with about seven setiferous punctures. *Sternum*: metepisterna nearly twice as long as wide, rather strongly punctate. *Venter*: the segments with two or three setæ on each side. *Legs*: tarsi glabrous above, protarsi ♂ with 2 dilated joints, clothed beneath with a very thick hairy pad, joint 4 of metatarsi produced at apex, metacoxæ plurisetose at base. Body winged.

Length, 14–15 mm.; width, 4·8–5·4 mm.

SIKKIM: Darjiling (*Desgodins*–type); Gopaldhara (*H. Stevens*); Maria Basti. NEPAL: Sundrijal (Ind. Mus.). UNITED PROVINCES: Kumaon, Haldwani, Tanakpur, and R. Sarda Gorge (*H. G. Champion*). PUNJAB: Simla Hills, Gahan, 7000 ft. (*S. N Chatterjee*).

Type in Mr. René Oberthür's collection.

36. **Nebria masrina**, *Andr.*

Nebria masrina, Andrewes in Mission Babault Ind. Carab. 1924, p. 68; Bänninger, Ent. Mitt. 1925, p. 264.

Colour black (head without discal red spots); mandibles, palpi, antennæ (joint 1 at extremities only), border (very narrowly) and epipleura of elytra, meso- and metasternum, middle of venter, and legs (femora at extremities only) dark red.

Head moderately convex, shiny, neck without constriction, smooth, a few minute punctures at back and some slight striation in front of eyes, clypeus emarginate, uneven in front, bisetose (but in the unique type there are two setæ on the left side), clypeal suture fine but distinct; gula with an irregular row of at least a dozen setæ just behind suture, joint 2 of labial palpi trisetose, mentum with a very short wide notched tooth, antennæ reaching fully to middle of elytra. *Prothorax* narrow, elongate, moderately convex, distinctly wider than head, a fourth wider than long, widest at a fourth from apex, base

truncate, sinuate on each side close to angles, as wide as apex, sides bisetose, with very narrow reflexed border, moderately rounded in front, contracted and nearly straight behind, a faint sinuation just before the hind angles, which are sharp and slightly acute, front angles a little advanced and rounded; median line fine, reaching base and (very nearly) apex, transverse impressions rather shallow, basal foveæ deep, curving inwards from the angles and then outwards, disk smooth, with some transverse striation towards base, margins lightly punctate. *Elytra* flat, elongate-ovate, widening behind, divergent at apex, each one sharply rounded, with very sloping

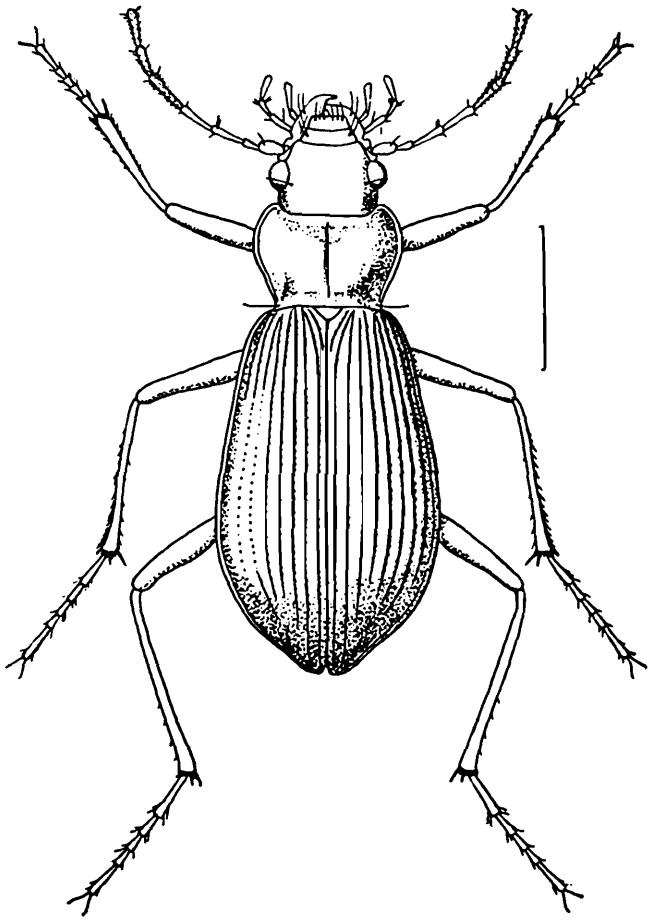


Fig. 24.—*Nebria masrina*, Andr.

shoulders, two-thirds as wide again as prothorax, and as much longer than wide, widest at a third from apex, a narrow reflexed border, sides faintly sinuate behind shoulder and again near apex; fairly deeply punctate-striate, the punctures small and, like the striæ, evanescent towards apex, scutellary striole unusually short, intervals smooth, slightly convex in front, flat behind, apex of 4–8 forming a short carina close to margin, 1 and 3 without pores. *Sternum*: metepisterna moderately long but very small, concave. *Venter*: segments with a row of about 4 setæ on each side. *Legs*: tarsi glabrous on upper surface, joint 4 of metatarsi produced beneath, metacoxæ unisetose at base. Body wingless.

Length, 12·5 mm.; width, 5 mm.
KASHMIR: Baltal (*G. Babault*).
Type ♀ in my collection. The ♂ is unknown.

37. **Nebria barbata**, sp. nov.

Colour black, head without discal red spots, palpi (paler at base and apex), antennæ, tibiæ, and tarsi red-brown, femora and venter piceous.

Head fairly wide, faintly constricted behind eyes, disk with one or two faint impressions, but otherwise smooth, frontal foveæ wide, shallow, and a little uneven, a few fine striæ on each side between them and eye, clypeus slightly emarginate, its front half depressed and with a few short, longitudinal striæ, clypeal suture bisinuate, shallow at middle, moderately deep at sides; gula with a transverse row of about a dozen setæ of varying length on each side, tooth of mentum with a wide but shallow emargination, joint 2 of labial palpi trisetose, antennæ long and very slender, reaching approximately middle of elytra. *Prothorax* cordate, about a third wider than head and as much wider than long, widest at a third from apex, base truncate, very slightly narrower than apex, which is widely but slightly emarginate, sides with a narrow, reflexed border, strongly rounded in front, then straight to base, a seta on each side in the marginal channel at widest point, none behind, the angles inconspicuous, front ones rounded, hind ones sharp, bent backwards and minutely reflexed; median line fine, connecting the two transverse impressions, both of which are fairly deep, basal foveæ small, but evident, close to the angles, disk with two slight impressions on each side, basal area finely but feebly punctate, some even slighter puncturation along sides and near front margin. *Elytra* rather flat, ovate, separately and sharply rounded at apex, nearly twice as wide as prothorax, three-quarters longer than wide, shoulders rounded, sides with a narrow reflexed border; striæ moderately deep, strongly punctate, shallower at sides and almost disappearing near apex, intervals nearly flat, apical carina rudimentary, no setiferous pores. Microsculpture formed by a reticulation of moderately wide meshes on elytra and prothorax, the meshes on head faint and isodiametric. *Sternum*: metepisterna small, half as long again as wide. *Venter*: the segments, including apical one, with 3 setæ on each side. *Legs* long and slender, tarsi glabrous above, protarsi ♂ with three slightly dilated joints, metatarsi with joint 4 produced beneath at apex, metacoxæ bisetose at base. Body (apparently) wingless.

Length, 10 mm.; width, 4 mm.
KASHMIR (*F J Mitchell*).
Type, a unique ♂ specimen, in the British Museum.

38. **Nebria pindarica**, *Andr.*

Nebria pindarica, Andrewes, Ann. Mag. Nat. Hist. (9) xv, 1925, p. 307; Bänninger, Ent. Mitt. 1925, p. 264.

Colour black, with two widely separated red spots between the eyes; palpi, antennæ, apex of femora, tibiæ, and tarsi piceous.

Head rather narrow, moderately constricted behind eyes, surface nearly smooth, with a few irregular light scratches, frontal foveæ obsolete, clypeus lightly emarginate, clypeal suture moderately deep; gula with a row of setæ on each side, tooth of mentum rather deeply notched, joint 2 of labial palpi bisetose, antennæ slender, reaching middle of elytra. *Prothorax* cordate, moderately convex, about a fifth wider than head, extremities truncate, base slightly narrower than apex, sides with a narrow reflexed border and a single lateral seta, moderately rounded in front and sinuate behind a little before the angles, which are right, front angles slightly advanced, not quite touching neck; median line very faint, transverse impressions deep and with the lateral channels rather indistinctly rugose-punctate, disk with some faint cross-striation. *Elytra* flat, elongate-ovate, rather strongly dilated behind, separately though rather sharply rounded at apex, two-thirds wider than prothorax and as much longer than wide, widest behind middle, shoulders very sloping, border narrow and reflexed, faintly sinuate behind shoulder, but hardly appreciably so near apex; striæ finely punctate, very lightly impressed, except close to base, and evanescent at sides and apex, intervals flat, without apical carina, 1 with a pore on left side only close to base, 3 with four small pores on left elytron, two on right. *Sternum*: metepisterna small, concave, barely half as long again as wide, vaguely punctate. *Venter*: the segments with 3 to 5 setæ on each side, apical segment ♀ with two setæ on each side. *Legs*: tarsi glabrous above, joint 4 of metatarsi obliquely truncate at apex and strongly produced beneath, metacoxæ with two or three setæ at base. Body apterous.

Length, 12·5 mm.; width, 4·5 mm.

United Provinces: Pindar Valley, 8000–11,000 ft. (*H. G. Champion*).

Type in the British Museum. This is a ♀ example, at present unique.

The connexion with *masrina* is evidently a very close one, but there are two important differences; in that species the second joint of the labial palpi is trisetose and there is a seta at each hind angle of the prothorax, whereas in *pindarica* the palpi are bisetose, and the postangular seta of the prothorax is not present. Each species, however, is at present

represented by a single ♀ specimen, and fresh material, when found, especially if it contains examples of the other sex, will no doubt assist in elucidating such apparent anomalies.

39. Nebria pharina, sp. nov.

Colour piceous-black, a large V-shaped marked on head, explanate side margins and propleura of prothorax, side margins of elytra up to stria 6 and the epipleura, prosternum, femora, and tibiæ flavous; palpi, joints 1 to 4 of antennæ, mentum, proepisterna and middle of venter light brown.

Head wide, without any neck constriction, frontal foveæ very shallow, surface a little uneven in front, otherwise smooth, clypeus moderately emarginate, clypeal suture fine; gula with a transverse row of 4 setæ on each side, tooth of mentum with a wide and fairly deep emargination, joint 2 of labial palpi trisetose, antennæ unusually stout, reaching basal fourth of elytra. *Prothorax* moderately convex, cordate, barely wider than head, nearly half as wide again as long, widest a little before middle, extremities truncate, front angles a little advanced, distinct though rounded, sides somewhat explanate, finely and indistinctly bordered, gently rounded in front and moderately sinuate behind at some little distance from base, a very fine pore and seta on the border in front on each side just before middle and another at hind angle, the hind angles sharply rectangular; median line just visible, transverse impressions both fairly deep and a little uneven, surface smooth, with some faint cross-striation, basal area with some vague indications of puncturation. *Elytra* moderately convex, ovate, separately rounded at apex, a half wider than prothorax, and as much longer than wide, widest well behind middle, shoulders cut away obliquely, so that the base is hardly wider than the base of prothorax, sides with a narrow reflexed border; striæ very fine and lightly impressed, with minute punctures, outer ones hardly visible, intervals flat, no setiferous pores. *Sternum*: metepisterna about half as long again as wide. *Venter* smooth, the segments with a single seta on each side, apical segment with one on each side in the ♂, two in the ♀. *Legs*: tarsi practically glabrous above, though with one or two minute hairs at apex of joints, protarsi ♂ with triangular joints, as long as wide, the first two slightly dilated, metatarsi with joint 4 hardly produced at apex, metacoxæ unisetose at base. Body apterous.

Length, 10 mm.; width, 3·6 mm.

TIBET: Phari, 16,000 ft., 19. vii. 1924 (*R. W G. Hingston*—Mount Everest Expedition).

Type in the British Museum.

The species does not bear much resemblance to any Indian one, but is very closely allied to *roborowskii* Sem. from Western China. Dr. Horn has been kind enough to send me a typical example of this for comparison. Semenow's species is a little smaller and quite dark, the legs and antennæ brown, with the margins of prothorax and elytra vaguely and narrowly brownish. The general form is almost exactly similar, including the short, stout antennæ, elytra with faint striæ and no dorsal pores, and joint 4 of the metatarsi hardly produced. In *roborowskii* the prothorax is a little shorter, the sides are sinuate a little nearer the hind angles and bear two lateral setæ on each side in front instead of one, the front transverse impression is shallower and the basal area a little less smooth. On the elytra the striæ are a little fainter and the punctures a little more evident, the microsculpture much more clearly defined and the surface consequently rather duller. Joints 2 and 3 of the protarsi are wider, and much more rounded.

40. **Nebria superna**, *Andr.*

Nebria superna, Andrewes, Ann. Mag. Nat. Hist. (9) xi, 1923, p. 273; Bänninger, Kol. Rundsch. 1923, p. 142; id., Ent. Mitt. 1925, p. 266.

Colour brown-red, elytra piceous; joints 1 to 4 of antennæ and palpi (more or less), femora, and trochanters red; rest of antennæ fuscous. The head is sometimes red, sometimes dark brown, with either two reddish spots or a V-shaped mark.

Head rather flat, smooth, middle of front a little uneven, both neck constriction and frontal foveæ only faintly indicated, clypeus slightly, labrum deeply emarginate, clypeal suture fine; mandibles striate in the scrobe, strongly curved, with a very sharp hook at apex; gula with a single seta on each side near buccal fissure, tooth of mentum short and wide, slightly emarginate, joint 2 of labial palpi bisetose, antennæ thick, barely reaching middle of elytra, joint 1 short and widely dilated, 2 very short, not more than a third of 1, 3 half as long again as 1 and about equal to the apical joints, 4 a little shorter than 3, 3 and 4 strongly compressed laterally close to base. *Prothorax* moderately convex, barely wider than head and only slightly wider than long, the proepisterna just visible from above and producing the effect of a slight emargination behind the front angles, extremities truncate, sides very narrowly bordered, gently rounded in front, with a fairly marked sinuation a little before hind angles, which are right and moderately sharp, projecting a little laterally, no marginal pores or setæ; median line fine, front transverse impression

fairly deep, hind one deeper, with the basal foveæ merging in it at sides, surface generally smooth, rather vaguely punctate along the transverse impressions. *Elytra* elongate-ovate, rather flat, separately and sharply rounded at apex, not quite twice as wide as prothorax, and two-thirds longer than wide, widest behind middle, shoulders obsolete, sides finely bordered, barely sinuate either behind shoulder or near apex; finely punctate-striate, stria 1 fairly deep on disk and quite clear to apex, the others progressively finer towards both sides and apex, where they become obsolete, scutellary striole short,

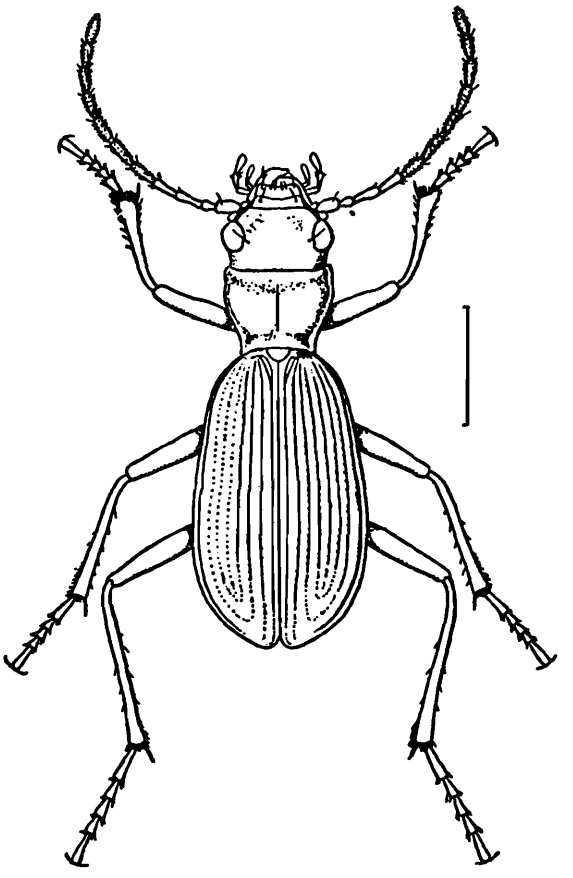


Fig. 25.—*Nebria superna*, Andr.

intervals flat, though slightly convex on disk, no sign of a carina at apex, no setiferous pores, the punctures of the marginal series few, small, and far apart, surface smooth and slightly sericeous, microsculpture very clear isodiametric. *Sternum*: metepisterna small, concave, smooth, barely a half longer than wide, and hardly contracted behind. *Venter*: the segments with 2 (sometimes 3) setæ on each side of median line, apical segment ♂ with one seta, ♀ with two setæ. *Legs*: tarsi almost moniliform, glabrous above, though with traces of minute hairs at apex of some of the joints, protarsi ♂ without dilated joints or any squamæ or hairs beneath, joint 4

of metatarsi slightly produced beneath at apex, metacoxæ with 3 to 5 setæ at base. Body apterous.

Length, 10·5–11·5 mm.

TIBET: Rongbuk, 16,500 ft. (*T. G. Longstaff* and *R. W G. Hingston*).

Type in the British Museum.

Group V. NOTIOPHILINI.

The group contains but a single genus, *Notiophilus*, widely spread in the palæarctic region, but represented within our limits by only two species. They are comparatively small, and are characterized by their parallel form and brassy colour, enormous eyes, a series of longitudinal ridges on the head, and a rather broad, highly polished space between intervals 1 and 2 of the elytra. The procoxal cavities are open behind, the mesosternum is carinate, the apex of the front tibiæ is obliquely excised, with the variable spur at the base of the excision, and the mandibles have a seta in the scrobe.

Genus **NOTIOPHILUS.**

Notiophilus, Dumeril, Zool. Analyt. 1806, p. 194; Dejean, Spec. Gen. ii, 1826, p. 276; Lacordaire, Gen. Col. i, 1854, p. 43; Putzeys, Note sur les *Notiophilus*, Mém. Liége, (2) i, 1866, pp. 153-66; Ganglbauer, Käf. Mitteleur. i, 1892, p. 116; Spaeth, Revision, Verh. Zool.-Bot. Ges. Wien, 1899, p. 510; Dupuis, Gen. Ins., Fasc. 134, Notiophilinæ, 1912, p. 3; Bänninger, Ent. Mitt. 1925, p. 185.

TYPE, *Cicindela aquatica*, L. (Palæarctic region.)

Form elongate, flat, shiny. *Head* short, usually as wide as prothorax, with enormous convex eyes, which occupy the whole side of the head and are separated by a narrow groove from the buccal fissure, one supraorbital puncture; front covered by a series of longitudinal ridges, reaching from clypeus to vertex, clypeus also irregularly ridged and bisetose, clypeal suture strongly marked; labrum small, narrowed and rounded at apex, shagreened, sexsetose; mandibles short, curved, right one with a tooth at about middle; mentum emarginate, with a short, wide, bifid tooth, lobes rounded, epilobes extending as a tooth beyond the lobes, the gula behind mentum transversely sulcate; ligula dilated, pointed at extremity, bisetose, the setæ divergent, the paraglossæ adnate at base, their linear membranous apices extending some little way beyond ligula, and separated from it by a wide emargination; palpi small, with short joints, a little narrowed and truncate at apex, joint 2 of labials bisetose on inner margin,

maxillaries with 4 nearly twice as long as 3 ; maxillæ slender, hooked at apex, and very sharp ; antennæ short, approximately reaching base of prothorax, pubescent from joint 3, but joints 3 and 4 (especially 3) with a very few hairs. *Prothorax* slightly convex, transverse, nearly as wide as elytra, front margin dilated in the middle to form a blunt tooth, sides narrowly bordered, rounded close to the front angle, and gently contracted to base, with a seta on each side at a fourth from apex, none at hind angle, surface more or less punctate. *Elytra* parallel, elongate, convex at sides only, base bordered, striate-punctate, with nine striæ (including the punctate marginal channel), and a short scutellary striole, which is sometimes duplicated, 8 deeply impressed just before it joins the marginal channel near apex, a wide highly polished interval between striæ 1 and 2, interval 8 forming a ridge near apex. *Sternum* : prosternal process spatulate, bordered, fitting into a mesosternal groove. *Venter* : segments 3 to 5 with a seta on each side of median line, apical segment ♂ with one seta, ♀ with two setæ close together on each side. *Legs* short, finely spinulose, metacoxæ with two setiferous pores, tarsi with a few spinules on upper surface, joint 1 shorter than 2+3 in the ♂ (Indian species), joints 1 to 3 of protarsi slightly dilated and clothed beneath with spongiose tissue, claws smooth.

Range. Europe, Northern and Central Asia (including Western Himalayas), and North America.

The early states of the Indian species are unknown, but Schiødte (Nat. Tidsskr. 1867, p. 452, t. 13. ff. 12–19) has described and figured the larvæ of *N biguttatus*, F and *N. aquaticus*, L. The larva and pupa of *N biguttatus*, F are figured by Dupuis (Gen. Ins., Notiophilinæ, 1912, t. ff. 2–3).

Key to the Species.

1 (2) Colour cupreous, elytra twice as long as wide, the pores forming striæ 1 and 2 clearly impressed . . . *orientalis*, Chaud., p. 136.

2 (1) Colour dark bronze, elytra three-fourths longer than wide, the pores forming striæ 1 and 2 barely visible. *radians*, Andr., p. 138.

41. Notiophilus orientalis, *Chaud.*

Notiophilus orientalis, Chaudoir *, Bull. Mosc. 1850, ii, p. 428; Putzeys, Note sur les *Notiophilus*, Mém. Liége, (2) i, 1866, p. 163; Spaeth, Verh. Zool.-Bot. Ges. Wien, 1900, p. 50; Dupuis, Gen. Ins., Fasc. 134, Notiophilinæ, 1912, t. f. 14; Andrewes, Ent. Month. Mag. 1926, p. 66.

Colour cupreous, apex sometimes faintly red, beneath black, with a brassy reflection ; base of palpi and joints 1 to 4 of

antennæ more or less testaceous (joint 1 dark above), femora at apex, tibiæ, and tarsi reddish.

Head quite as wide as prothorax, with eight fine, nearly parallel carinæ on middle of front (the number somewhat variable), clypeal suture very deep, clypeus longitudinally striate, with a transverse interrupted sulcus behind, neck alutaceous, sides of head behind finely rugose-punctate, eyes immense, labial palpi ♂ with the apical joint strongly dilated, though hardly securiform, antennæ barely reaching base of prothorax. *Prothorax* rather flat, a little narrower than elytra and quite a third wider than long, widest close to

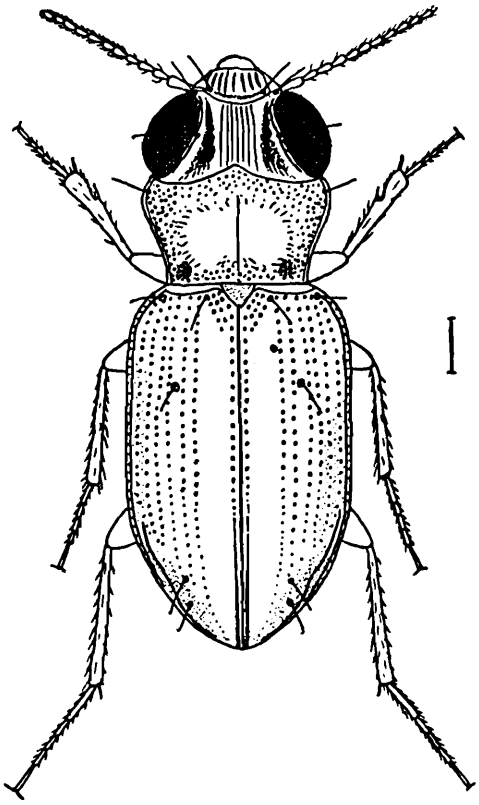


Fig. 26.— *Notiophilus orientalis*, Chaud.

front angles, thence nearly straight to base, the sides gently contracted and a little sinuate before the hind angles, which are right; median line short but well marked, basal foveæ moderately deep, a smooth polished area on each side of disk, but the rest of the surface closely and confluently punctate. *Elytra* parallel, twice as long as wide, sides slightly sinuate near apex, finely striate-punctate, intervals 1 and 2 polished and almost smooth, the rest rather finely but variably punctate, sides and apex with a conspicuous microsculpture of isodiametric meshes, interval 2 as wide as 3 and 4 taken together, 1 and 5 to 7 narrow, 8 as wide as 3, but narrowed and carinate at apex, 4 with three large umbilicate pores, one

rather before middle, and two close to apex. *Sternum*: pro- and metasternal processes bordered, proepisterna with a few coarse punctures in front, metepisterna narrow and concave. *Venter* smooth, but roughly sculptured at base.

Length, 4·75–5·25 mm.; width, 1·6–1·7 mm.

UNITED PROVINCES: Central and West Almora, Upper Gumti Valley, and East Ramganga Valley, 5000 ft. (all *H. G. Champion*); Pilibhit district (*E. C. Ansorge*); Chakrata, Konain, 8000 ft. (*S. N Chatterjee*). PUNJAB: Simla (*Capt. Boys* and *N Annandale*); Simla Hills, Matiana, 7900 ft. (*S N. Chatterjee*); Murree, 7500 ft. (*Dutt*); Dharmsala (*H. G. Champion*). KASHMIR (*C. Rost*). N. W Front. Prov.; Kurram Valley, Parachinar (*F W Champion*).

Type in Mr. René Oberthür's collection.

The two examples found at Konain and Dharmsala respectively are rather larger and more roughly sculptured than the typical form, the sides of the elytra more evidently punctate; they do not quite agree, so for the present it seems best to treat them as mere varieties.

42. **Notiophilus radians**, *Andr.*

Notiophilus radians, Andrewes, Ent. Month. Mag. 1926, pp. 66 and 70.

Colour dark bronze above; underside, legs, and antennæ piceous, joints 2 to 4 of the antennæ more or less ferruginous.

Head wide, only just narrower than prothorax, with eight fine, nearly parallel carinæ on middle of front, neck alutaceous, clypeal suture deep, clypeus somewhat raised, longitudinally striate in front, a transverse interrupted sulcus behind, eyes very large, antennæ not reaching base of prothorax. *Prothorax* rather flat, a little narrower than elytra, nearly a third wider than long, widest close to front angles, thence with the sides straight to hind angles, which are right; median line very short, basal foveæ deep and rounded, margins widely and fairly densely punctate, disk smooth. *Elytra* rather flat, two-thirds longer than wide, striate-punctate, striæ 1 and 2, together with scutellary striole, excessively fine and traceable only by the minute punctures (though 1 is distinct close to apex), the other striæ gradually increasing in depth towards sides, interval 2 as wide as 3 and 4 together, 1, 5, 6 and 7 about a third of 2, 8 at middle equal to 3, intervals 1 to 3 very smooth and shiny, without microsculpture, the other intervals with some fine punctures and a very clear isodiametric microsculpture, interval 4 with a large pore in front, and two close together near apex, alongside the raised eighth interval. *Sternum*:

pro- and metasternal processes bordered, sides of sterna coarsely punctate. *Venter* with its base coarsely punctate.

Length, 5 mm.

UNITED PROVINCES: Almora, Gori Valley, 7000 ft. (*H. G. Champion*).

Type in the British Museum. This is a unique ♀ specimen.

Group VI. OMOPHRONINI.

This group contains the single genus *Omophron*, which is exceptionally well represented in India. It is very well characterized by its nearly circular form, and can only be confused with the genus *Cyclosomus*, from which it differs widely in structural characters. The procoxal cavities are closed behind, the mesosternum carinate, the mandibles with a seta in the scrobe, the protibiæ emarginate inwardly, with the variable spur at base of emargination, and the prosternal process developed into a large plate, quite concealing the mesosternum.

Genus **OMOPHRON.**

Omophron, Latreille, Hist. Nat. Crust. et Ins., iii, 1802, p. 89; Dejean, Spec. Gen. ii, 1826, p. 257; Lacordaire, Gen. Col. i, 1854, p. 42; Chaudoir, Note monographique snr le genre *Omophron*, Rev. et Mag. Zool. 1868, p. 54; Gestro, Ann. Mus. Civ. Gen. xxx, 1892, p. 961; Ganglbauer, Käf. Mitteleur. i, 1892, p. 116; Rousseau, Gen. Ins., Fasc. 83, Omophroninæ, 1908, p. 2; Bänninger, Deutsch. Ent. Zeitschr. 1915, p. 225; id., Deutsch. Ent. Zeitschr. 1918, p. 97.

Scolytus, F. (not Müll.), Ent. Syst. i (1), 1792, p. 180 (part).

TYPE, *Scolytus limbatus*, F (Europe and Central Asia.)

Form very short oval, very convex. *Head* short, wide, deeply inserted in prothorax, sides in front generally bordered, the border a little dilated and reflexed, gula generally with a seta at each side, eyes large but not prominent, narrowly separated from buccal fissure, with one supraorbital seta; clypeus triangular, clypeal suture distinct and usually angulate in middle, labrum truncate or emarginate, sexsetose; mandibles short, curved, feebly dentate, with a seta in the scrobe (in some African species the upper margin of the scrobe forms a sharp raised ridge); ligula a little dilated at apex, truncate or rounded, bisetose, the paraglossæ adnate, separated from ligula at apex by a slight notch; mentum emarginate, with a short simple tooth, lobes strongly rounded, epilobes narrow, often extending a little beyond lobes, pointed at extremity; maxillæ slender, hooked at apex and very sharp, outer lobe

jointed ; palpi elongate, slender, narrowly truncate, sometimes rounded at apex, labials with joint 2 plurisetose on inner margin ; antennæ slender, pubescent from joint 5, joint 1 with either one or two setæ at apex, 3 and 4 sometimes with setæ on outer margin. Beneath the head and behind the eyes is a transverse ridge (*subocular ridge*) with a groove in front, between which and the eye the surface is more or less rugose or punctate. *Prothorax* trapezoidal, increasing in width from apex to base, which exactly fits the base of the elytra, front angles very sharp, middle of base projecting and concealing the scutellum, apex deeply emarginate, generally bisinuate, sides without any setæ. *Elytra* shortly oval, convex, normally with 15 striæ (14 in some African species), but striæ 13 and 14 are sometimes obsolete, no scutellary striole, no setiferous pores, the base emarginate in middle, and more or less bisinuate at sides. A very fine microsculpture, consisting in a reticulation of isodiametric or slightly transverse meshes, is usually present ; in one group it is wanting. *Sternum* : prosternal process dilated between and behind coxæ into a large pentagonal plate, which is apposed to the metasternum, and by its union with the proepimera closes the coxal cavities behind, completely concealing the mesosternum, proepimera fused with or separated from their episterna ; mesosternum short, longitudinally carinate, the epimera reaching coxal cavities ; metasternum bordered in front, the episterna as long as or longer than wide, the epimera invisible. *Venter* bordered in front, segments 4 to 6 with a seta on each side, sometimes wanting on 5, segments 1 to 3 (or some of them) often fused. *Legs* slender, clothed with very fine spinules ; metacoxæ with 2 pores (except in *O. vittatus* and *O. brettinghamæ*) ; tarsi rather sparsely pilose on upper surface, joint 1 equal to or not much shorter than 2+3+4, in the ♂ (Indian species) joints 1 and 2 of protarsi and 1 of mesotarsi slightly dilated (much dilated in *O. chelys*—as in some American species), and clothed beneath with spongiose tissue, claws smooth.

Range. Europe, Africa, Asia, North and Central America.

The metamorphoses of the Oriental species of this genus are quite unknown, but those of the European *O. limbatus*, F., have been described by Schiφdte (Nat. Tidsskr., 1867, p. 445, t. 12. ff. 8 to 17). The larva has a very large convex thorax, and is said to bear some resemblance to a mole-cricket.

In describing the elytral pattern of the various species, I have, for greater clearness and irrespective of the general scheme of coloration, sometimes considered the elytra as testaceous with a green pattern, sometimes as green with a testaceous pattern.

Key to the Species.

1 (24) Joint 1 of antennæ bisetose at apex, joints 3 and 4 with setæ along outer margin. Surface of prothorax more or less coriaceous (very faintly in *lunatus* and *virens*), sometimes punctate as well. Elytra with 15 striæ, intervals generally rugose or punctate. A noticeable break in the contour at the junction of prothorax and elytra. Microsculpture present.

2 (17) Clypeus bisetose, ventral segment 5 glabrous.

3 (14) Elytral intervals rugose or punctate.

4 (7) Elytral intervals rugose at sides, smoother on disk, the pattern including dark green stripes at sides.

5 (6) Clypeus rugose, mandibles very long and sharp, maxillary palpi with joint 3 considerably longer than 4. Surface of prothorax closely granulate, with green central patch and small round spot at each side. Elytra dentate at sides. Length 8 mm. . *porosus*, Chaud., p. 144.

6 (5) Clypeus smooth, mandibles normal, maxillary palpi with joint 3 shorter than 4. Surface of prothorax coriaceous, with a very small dark patch at middle of base. Elytra not dentate at sides. Length 6·25 mm. . *interruptus*, Chaud., p. 144.

7 (4) Elytral intervals each with a row of punctures, the green pattern spotted, not vittate.

8 (11) Puncturation of elytral intervals rather fine, but clearly visible under an ordinary lens.

9 (10) Surface of prothorax coarsely coriaceous, elytra strongly dilated behind shoulder, puncturation of intervals not very fine . .. .. *guttatus*, Chaud., p. 145.

10 (9) Surface of prothorax nearly smooth, but coarsely punctate along front and hind margins, elytra only moderately dilated behind shoulder, puncturation of intervals fine. .... .. *lunatus*, Bänn., p. 146.

11 (8) Puncturation of elytral intervals very minute, visible only under a strong lens.

12 (13) Clypeal suture forming a wide angle in middle, puncturation of head and base of prothorax coarse, the green colour of elytra fairly bright, the yellow colour on intervals 14 and 15 uninterrupted. Length 7·5 mm. *testudo*, Andr., p. 147.

13 (12) Clypeal suture semicircular, punctuation of head and base of prothorax moderate, the green colour on elytra dark, the yellow colour on intervals 14 and 15 interrupted. Length 7·5 mm.. .. . ... *affinis*, Bänn., p. 148.

14 (3) Elytral intervals smooth.

15 (16) Front margin of clypeus curved, sinuate near angles, which are advanced. Base of prothorax coarsely punctate. Length 7 mm. . . *striaticeps*, Gestro, [p. 149.

16 (15) Front margin of clypeus formed by two straight lines, meeting at a wide angle in middle. Base of prothorax moderately punctate. Length 6 mm.. . . . . *pictus*, Wied. p. 150.

17 (2) Clypeus quadrisetose.

18 (23) Prothoracic green marking reaching base, elytral markings not vittate, intervals with minute puncturation, metacoxæ with two setiferous pores.

19 (22) Prothorax roughly sculptured, the green patch on it nearly reaching sides, ventral segment 5 bisetose.

20 (21) Prothorax coarsely coriaceous, punctures on elytral intervals just visible under an ordinary lens, front and intermediate testaceous patches interrupted on interval 13 . *maculosus*, Chaud., [p. 151.

21 (20) Prothorax coarsely punctate, punctures on elytral intervals visible only under a strong lens, front and intermediate testaceous patches united along interval 13. .. . *smaragdus*, Andr., [p. 152.

22 (19) Prothorax punctate only along front and hind margins, the green patch on it not nearly reaching sides, ventral segment 5 glabrous . .. . *virens*, sp. nov., p. 153.

23 (18) Prothoracic green marking not reaching base, elytral markings entirely vittate, intervals smooth, metacoxæ with one (apical) setiferous pore, ventral segment 5 glabrous. *vittatus*, Wied., p. 154.

24 (1) Joint 1 of antennæ unisetose at apex, joints 3 and 4 without setæ along outer margin, clypeus bisetose. Prothorax punctate never coriaceous. Elytra sometimes with 15 striæ (at least at base), sometimes with striæ 13 and 14 wholly or partly obsolete, intervals always smooth. Microsculpture present or wanting.

25 (34) Front margin of clypeus narrowly but strongly bordered, subocular ridges well developed. Elytral striæ more or less evanescent at sides or behind. Contour hardly broken at junction of prothorax and elytra. Microsculpture wanting. Length about 4 mm.

26 (29) Elytra with 15 striæ, 14 very short and disappearing not far from base.

27 (28) Head nearly uniformly punctate, margin of prothorax and elytra moderately reflexed. Joint 1 of protarsi ♂ moderately dilated, not longer than 2 to 4 taken together .... . *oberthüri*, Gestro, [p. 155.

28 (27) Head nearly smooth in middle, margin of prothorax and elytra widely reflexed. Joint 1 of protarsi ♂ enormously dilated, longer than 2 to 4 taken together .. .... *chelys*, Andr., p. 156.

29 (26) Elytra with 13 striæ, 13 and 14 obsolete.

30 (31) Markings on upper surface bright green, puncturation rather coarse, dark pattern on elytra occupying quite three-fourths of the area *gemmeus*, Andr.,

31 (30) Markings on upper surface dark green, puncturation moderate to fine, dark pattern on elytra occupying less than three-fourths of the area. [p. 157.

32 (33) Form convex. Metacoxæ with one (apical) setiferous pore. Markings on upper surface blackish green, dark pattern on elytra occupying about two-thirds of area. ... ... *brettinghamæ*, Pasc.,

33 (32) Form relatively flat. Metacoxæ bisetose. Markings on upper surface bluish green, dark pattern on elytra occupying less than half the area . *bicolor*, Andr., p. 159. [p. 158.

34 (25) Front margin of clypeus unbordered, subocular ridges rudimentary. Elytra with 15 entire striæ. Contour broken at junction of prothorax and elytra. Microsculpture present. Length 6–7 mm.

35 (36) Markings on upper surface bright green, that on prothorax extending nearly to side-margins, surface of elytra smooth, the microsculpture very faint .. ... *axillaris*, Chaud., p. 160.

36 (35) Markings on upper surface greenish brown, that on prothorax not extending beyond level of stria 8, surface of elytra finely shagreened, the microsculpture conspicuous . .. *rotundatus*, Chaud., [p. 161.

43. Omophron porosus, *Chaud.* [Plate III, fig. 2.]

Omophron porosus, Chaudoir *, Mon. p. 61.
Omophron porosum, Bänninger, Deutsch. Ent. Zeitschr. 1918, pp. 99 and 103.

Colour testaceous, elytra rather lighter, their epipleura pale straw-coloured, sternum black; a triangular patch on each side at back of head, a median triangular patch with dilated sides and two small round lateral spots on prothorax, together with an elytral pattern very dark, faintly bluish green. The base of the elytra is very narrowly green, and the pattern includes two short basal vittæ on intervals 8–9 and 11–12, a vestige of a third on 14, two short ones on 13 at a little before a half and at two-thirds, a long one on 10 from a fourth to rather beyond three-fourths, two transverse patches extending from suture to stria 7 and joined along interval 6, the former projecting a little backwards on 4, the latter on 6; the suture green from base to near apex.

Head flat, rugose-punctate, sides bordered, the border rounded and dilated in front, clypeus bisetose, widely emarginate in front, suture with an obtuse angle in middle, labrum emarginate, mandibles elongate, strongly curved, and very sharp at apex, lobes of mentum truncate, maxillary palpi long, joint 3 quite a third as long again as 4, subocular ridge extending beyond buccal fissure, the surface in front of it striate-punctate. *Prothorax* closely granulate, moderately convex, base bisinuate on each side, sides almost straight, hind angles slightly rounded, median line finely incised. *Elytra* short oval, moderately convex, base bordered (except in middle), sides dilated and rounded beyond shoulder, the narrow border dentate in front; 15-punctate-striate, striæ 3, 4, and 11 terminating at some distance from apex, intervals moderately convex and nearly smooth on disk, much more convex, narrower, and rugose at sides. A fine microsculpture is present. *Sternum*: prosternum, prosternal plate, and base of episterna moderately punctate; metasternum smooth in middle, a few punctures at sides, episterna quite smooth, as wide as long. *Venter* with a few punctures at sides, segment 5 without setæ. *Legs*: metacoxæ with two pores.

Length, 7·5–8 mm.; width 4·75–5 mm.

BENGAL: Dacca.

Type in Mr. René Oberthür's collection.

44. Omophron interruptus, *Chaud.* [Plate III, fig. 3.]

Omophron interruptus, Chaudoir *, Mon. p. 62.
Omophron interruptum, Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 99.

Colour flavous, beneath testaceous, an ill-defined transverse

patch on middle of prothorax light brown; a narrow border at back of head and along internal margin of eye, a very small central basal patch on prothorax, and an elytral pattern very dark green. The base of the elytra is narrowly green to stria 13, and the pattern includes two vittæ on intervals 10 and 13, extending from base to a fourth from apex, that on 13 twice interrupted, once near its base and again near its extremity, a square patch at centre of base, extending outwards to stria 6, joined by a narrow line just before its apex to the vitta on 10, and nearly to that on 13, a narrow wavy transverse hind patch, in the form of a W, at about a fourth from apex, joined at sides to the vitta on 10, and along 6 to the square patch in front; the suture green from base to near apex.

Head flat, smooth, faintly striate near eyes, clypeus smooth, bisetose, widely emarginate in front, suture with an obtuse angle in middle, labrum emarginate, mentum small, deeply emarginate, lobes rounded, tooth acute, subocular ridge visible only as a short furrow behind buccal fissure, area behind eye lightly striate-punctate. *Prothorax* coriaceous, moderately convex, base bisinuate, sides almost straight, hind angles not much rounded, median line distinct, the dark colour at base extending along it to apex. *Elytra* short oval, moderately convex, base with an ill-defined border at sides, sides not much dilated behind shoulder, border minutely and inconspicuously dentate in front; 15-punctate-striate, intervals flat and smooth on disk, convex, narrower, and slightly rugose at sides. A fine microsculpture is present. *Sternum*: prosternum subcarinate, a few coarse punctures at sides, prosternal plate with one or two punctures only; metasternum smooth in middle, sparsely punctate at sides, episterna smooth, as long as wide. *Venter* with a few punctures at base, segment 5 without setæ. *Legs*: metacoxæ lightly punctate, with 2 setiferous pores.

Length, 6–6·5 mm.; width, 4–4·25 mm.

BENGAL; Dacca. "BENGAL" (*Dr. Bacon*—type).

Type in Mr. René Oberthür's collection.

45. Omophron guttatus, *Chaud.* [Plate III, fig. 4.]

Omophron guttatus, Chaudoir*, Mon. p. 62.

Omophron guttatum, Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 99.

Colour testaceous, a large transverse patch on prothorax, and middle of under surface brown; back and sides of head, an irregular triangular patch on prothorax, and an elytral pattern green. Taking for convenience the ground-colour as

green, there are on the elytra two irregular fasciæ, an apical patch, and the whole of marginal channel testaceous; the front fascia wide at margin, extending inwards to stria 3, much reduced in width over intervals 9–12, and nearly interrupted on 10; the hind fascia joining the apical patch along interval 14, extending inwards to stria 10, where it is interrupted, the inner portion, which is oblique and in advance of the outer part, reaching from stria 9 to 2, very narrow and nearly interrupted at stria 6; the apical patch reaching a fifth from apex, the testaceous colour advancing a little on intervals 2–3, and 7–10.

Head flat, front and clypeus finely shagreened and wrinkled, striate near eyes, vertex punctate, clypeus widely emarginate, an obtuse angle at middle of suture, labrum emarginate, mentum wide, with a sharp tooth, the narrow epilobes projecting at apex, subocular ridge strongly marked, extending rather beyond buccal fissure, the area in front finely rugosely striate. *Prothorax* moderately convex, coarsely coriaceous, a few punctures along front margin, sides almost straight, basal sinuation near hind angles very faint, median line distinct throughout. *Elytra* ovate, convex, base unbordered, sides strongly dilated and rounded behind shoulder; 15-punctate-striate, the striæ fine and rather inconspicuously punctate; intervals moderately convex, more so at sides, finely but clearly punctate. A fine microsculpture is present. *Sternum*: all sterna impunctate, surface of prosternal plate rather uneven, metepisterna distinctly longer than wide. *Venter* impunctate, segment 5 without setæ. *Legs*: metacoxæ with two pores.

Length, 6·5–7 mm.; width, 4–4·25 mm.

BENGAL: Berhampur (Ind. Mus.). "BENGAL" (*Dr. Bacon*—type). CHOTA NAGPUR: Nowatoli (*Cardon*). MADRAS: Ramnad.

Type in Mr. René Oberthür's collection.

46. **Omophron lunatus**, *Bänn.* [Plate III, fig. 5.]

Omophron lunatum, Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 104.

Colour testaceous yellow, sterna and base of venter piceous, prothorax with a light brown patch on each side of disk; back and sides of head, a triangular patch on middle of prothorax, and an elytral pattern dark green (the elytra almost black). Considering the elytra as dark green, including suture to near apex, there are on each side three marginal patches and the whole of the marginal channel testaceous; the front patch wide, reaching the shoulder at margin and narrowing inwards to stria 7, the colour advancing a little on interval 10; the second patch smaller, rather behind middle, reaching

inwards to stria 10, joining the apical patch along interval 15, and separated by four intervals from a very small spot, opposite its front margin, on intervals 4–6 ; apical patch reaching to a fifth from apex and extending a little forwards on intervals 7–9.

Head flat, front smooth, finely striate near eyes, vertex and sides punctate, clypeus bisetose, very faintly emarginate and bordered in front, the suture arcuate, labrum emarginate, mandibles short and not very sharp, mentum with truncated lobes, the narrow epilobes hardly projecting in front, subocular ridge extending beyond buccal fissure, area in front of it striate-punctate. *Prothorax* moderately convex, rather shiny, not or only very slightly coriaceous, strongly punctate both along base and front margin, sides gently rounded in front, sinuation of base near hind angles very faint, median line distinctly incised but not reaching base or apex. *Elytra* ovate, convex, base unbordered, sides moderately dilated behind shoulder ; 15-punctate-striate, the punctures clearly marked and rather close together, intervals of equal width throughout, moderately convex, very finely though distinctly punctate. A fine microsculpture is present. *Sternum* : all sterna sparsely punctate, metepisterna very slightly longer than wide. *Venter* punctate at base, segment 5 glabrous. *Legs* : metacoxæ with two pores.

Length, 6–6·5 mm. ; width, 4–4·25 mm.

CHOTA NAGPUR : Nowatoli (*Cardon*—type). CENTRAL PROVINCES : Motinala and Mandla (*G. Babault*).

Type in Mr. M. Bänninger's collection.

47. **Omophron testudo**, *Andr.* [Plate III, fig. 6.]

Omophron testudo, Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, p. 293.

Colour testaceous, underside (except apex) piceous, a patch on each side of disk of prothorax light brown ; back and sides of head, a transverse rectangular basal patch on prothorax, with a narrow projection in middle to front margin, and an elytral pattern green. Treating the elytra as green, including suture to near apex, there are two very irregular fasciæ, an apical patch, the whole of the marginal channel, and intervals 14–15 testaceous ; front fascia wide at margin, reaching shoulder, contracting and almost disappearing on interval 10, widening over 7–8, contracting again and disappearing on 5 ; hind fascia rather behind middle, extending from margin nearly to stria 2, interrupted on interval 10, the colour on 7–8 pushed a little forward, apical patch reaching to a fifth from apex, and sending an arm forward along 7–9.

Head flat, front nearly smooth, finely striate near eyes, vertex and sides coarsely punctate, clypeus bisetose, slightly emarginate and bordered, a transverse furrow across the middle, suture with an angle at middle, mentum with rounded lobes, epilobes narrow, not projecting beyond lobes, subocular ridge extending nearly to gular suture, the surrounding area finely rugose, and also (behind eyes) finely striate. *Prothorax* moderately convex, transversely impressed at base, coarsely but not roughly coriaceous, coarsely punctate along base, rather sparsely in front, sides gently rounded in front and faintly sinuate behind, median line fine but distinct, not reaching margins. *Elytra* ovate, convex, base unbordered, sides strongly dilated behind shoulder; 15-punctate-striate, the punctures small, indistinct at sides, intervals convex, more so at sides, with an exceedingly minute row of punctures along the middle of each. A fine microsculpture is present. *Sternum*: sterna practically smooth, one or two punctures on prosternal plate; metepisterna as long as wide. *Venter* smooth, segment 5 glabrous. *Legs*: metacoxæ with two pores.

Length, 7–7·5 mm.; width, 4·5–5 mm.

BURMA: Pegu. INDO-CHINA: Annam, Keng Trap; Tonkin, Tranninh; Laos, Ko Kieng (*R. Vitalis de Salvaza*).

Type in British Museum.

The Burmese specimens are rather smaller than those from Indo-China, and the puncturation of the elytral striæ is very indistinct.

48. **Omophron affinis**, *Bänn.* [Plate IV, fig. 1.]

Omophron affinis, Bänninger *, Deutsch. Ent. Zeitschr. 1918, p. 105.

Colour and pattern very similar to those of *O. testudo*, but the testaceous colour is rather lighter and the green darker, so that the design stands out more clearly. The green patch on the prothorax is narrower, and the testaceous border is interrupted, first behind the front fascia on intervals 14–15, and then behind the hind fascia on 14.

A little smaller and more elongate than *O. testudo* and structurally differing only in the following particulars. *Head* more finely punctate behind and more finely striate near eyes, clypeal suture almost semicircular, eyes less prominent. *Prothorax* narrower, more finely coriaceous, and less coarsely punctate. *Elytra* narrower, less dilated behind shoulder, striæ finer, intervals narrower and more convex, especially near apex; the microsculpture in this species is exceptionally fine.

Length, 6·5–7 mm.; width, 3·8–4 mm.

BENGAL: Berhampur. CHOTA NAGPUR: Nowatoli (*Cardon*—type).

Type in Mr. M. Bänninger's collection.

49. Omophron striaticeps, *Gestro*. [Plate IV, fig. 2.]

Omophron striaticeps, Gestro *, Ann. Mus. Civ. Gen. xxvi, 1888, p. 173; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 269; Bänninger, Deutsch. Ent. Zeitschr. 1918, pp. 99 and 106.

Colour flavous, brown beneath, ventral surface lighter; a wide transverse patch across middle of prothorax, base of clypeus, and mandibles (except black apex) light brown; back and sides of head, a triangular patch on prothorax, reaching apex in a widely rounded point, and an elytral pattern rather bright green. The base of the elytra and intervals 1–2 to near apex are green, the colour on latter dilated behind to stria 4; marginal channel flavous throughout. Taking the ground-colour as green, there are two very irregular fasciæ and an apical patch testaceous; the front fascia touches the shoulder, the outer part narrowing to stria 7 and interrupted on interval 10, the inner part, much in advance of the outer and joined to it along interval 7, continuing to stria 2; the hind fascia just behind middle, running obliquely forward from margin to stria 2, interrupted on intervals 6 and 10, the middle part on 7–9 very slight and thin; the apical patch has a very irregular outline, and sends two arms forward on intervals 3 and 7–9.

Head flat, front smooth, finely punctate behind and at sides, finely striate near eyes, clypeus smooth, bisetose, widely emarginate, the angles advanced, suture with a wide angle in middle; mentum wide, with smooth lobes, sharply rounded in front, epilobes forming a distinct tooth at apex; ligula narrow, paraglossæ rather wide and separated from it on each side by a notch rather wider than usual; labial palpi very long and slender; subocular ridge hardly extending beyond fissure, the area in front of it finely striate-punctate. *Prothorax* moderately convex, rather shiny, finely coriaceous and punctate, rugosely along base, sparsely in front and at sides of disk, sides very slightly rounded in front, base bisinuate on each side, median line sharply incised, very nearly reaching apex but not base. *Elytra* oval, convex, base unbordered, sides moderately dilated behind shoulders, border very distinctly dentate, almost to apex; 15-punctate-striate, the punctures clearly marked, intervals smooth (except under the microscope, when a row of minute punctures is visible on each), moderately convex on disk, more convex and narrower at sides. A fine microsculpture is present. *Sternum*: sterna almost smooth, prosternal plate uneven, a few punctures at base of proepisterna and on sides of metasternum, metepisterna smooth, as long as wide. *Venter* with some coarse punctures at sides of base, segment 5 glabrous. *Legs*: metacoxæ with two pores.

Length, 6–7 mm. ; width, 4–4·3 mm.

UPPER BURMA : Myeen Kyan (*L. Fea*—type). INDO-CHINA : Laos, Xieng Klay (*R. Vitalis de Salvaza*).

Type in Genoa Museum.

I have seen only two examples of this species, the type and the specimen from Laos. The latter is a little wider than the type, the shoulders more pronounced, and the prothorax rather less evidently punctate ; the elytral pattern is the same, but the testaceous patches are more developed and occupy a larger area.

50. **Omophron pictus**, *Wied.* [Plate II, fig. 2.]

Scolytus pictus, Wiedemann *, Zool. Mag. ii, 1, 1823, p. 69.
Omophron pictum, Bänninger, Deutsch. Ent. Zeitschr. 1918, pp. 99 and 106.
Omophron pictus, Andrewes, Trans. Ent. Soc. Lond. 1921, pp. 174 and 189.

Colour testaceous, sterna piceous ; sides and back of head, a small transverse patch at middle of base of prothorax, continued along median line as a narrow irregular stripe to near apex, and an elytral pattern green. The base of the elytra is green to stria 15, as is the suture to near apex, where the colour widens out (as in *O. striaticeps*) to stria 6 ; marginal channel and interval 15 testaceous from base to apex. On the green ground of the elytra there are two irregular fasciæ, and a very irregular apical patch testaceous ; the front fascia reaches shoulder and extends inwards to stria 2, nearly interrupted on interval 13 and quite on 10, while along 12 it joins the hind fascia, the inner part dilated in front, so as nearly to reach base, with the hind margin notched on 6 ; the hind fascia much constricted on interval 13, widening again to stria 10, interrupted on intervals 10 and 6, and reaching stria 2, the central part on intervals 7–9 very small and pushed a little forward ; the apical patch sends forward two short arms on intervals 3–5 and 11, also a very long one on 7–9, which overlaps the inner and outer, and nearly reaches the central part of the hind fascia.

Head flat, front smooth, back and sides rather finely, but not closely punctate-striate, border dilated at front angles, clypeus smooth, bisetose, unbordered, front margin formed by two straight lines meeting at an obtuse angle, suture angulate in middle, mentum with sharply rounded lobes, transversely striate, the epilobes just reaching beyond their apex, paraglossæ nearly pointed, separated from ligula by a slight notch only, and extending a little in advance of it, labial palpi long and slender, subocular ridge distinct, extending beyond fissure, the surface in front covered with large shallow

punctures. *Prothorax* moderately convex, shiny, very finely coriaceous, closely punctate along base, a few fine punctures along front margin, base bisinuate on each side, sides nearly straight, median line rather fine, not reaching extremities. *Elytra* ovate, convex, base with a slight border close to shoulder, sides moderately dilated behind shoulder ; 15-punctate-striate, the punctures strongly marked, intervals smooth (but under the microscope a row of very fine punctures is visible on each), rather flat on disk, narrower and convex at sides. A fine microsculpture is present. *Sternum* : prosternal plate, prosternum and base of its episterna, and sides of metasternum sparsely punctate, metepisterna almost smooth, as long as wide. *Venter* with some coarse punctures at sides of base, segment 5 glabrous. *Legs* : metacoxæ with two pores.

Length, 6–6.8 mm. ; width, 3·75-4·3 mm.

BENGAL (type). BIHAR : Pusa, at light (*H. M Lefroy*—Pusa Coll.). "Ind. Or." (Coll. Bänninger).

Type (♂) in the University Museum, Copenhagen.

I have seen only two examples of this species other than the type. In Mr. Bänninger's specimen the testaceous elytral pattern is somewhat reduced, but more clearly defined, the various patches being distinctly separated from each other.

51. Omophron maculosus, *Chaud.* [Plate IV fig. 3.]

Omophron maculosus, Chaudoir *, Bull. Mosc. 1850, i, p. 424.
Omophron maculosum, Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 99.

Colour flavous, sterna and base of venter piceous-brown ; back and sides of head, a wide transverse patch on prothorax, extending to base and covering its central third, extending also to a point at middle of apex, and an elytral pattern dark green. The base of the elytra is green to stria 15, as are intervals 1–2 to near apex ; the marginal channel and intervals 14–15, except close to base, are flavous throughout. On the green ground two series of spots and an irregular apical patch are flavous ; the front series consists of two elongate spots, one on intervals 11–12 at about a third from base, the other a little further forward on 7–9 ; the hind series consists of three spots, an elongate one rather behind middle on 11–12, a second shorter one further forward on 7–9, and an inner short one, level with the front part of the outer one, on 3–5 ; the apical patch is small, and sends forward a short bifurcate arm on 3–5, and a rather longer one on 7–9.

Head flat, vertex and sides finely punctate-striate, front and clypeus finely rugose, the latter quadrisetose, unbordered, widely emarginate, suture with a rounded angle at middle, lobes of

mentum almost truncate, epilobes rounded at apex, hardly projecting, paraglossæ very small, separated from ligula by a minute notch, subocular ridges extending little beyond fissure, the area in front of them finely striate-rugose. *Prothorax* moderately convex, coarsely coriaceous, a little puncturation visible along base and front margin, base rather strongly bisinuate on each side, sides nearly straight, median line fine, not quite reaching extremities. *Elytra* oval, convex, base unbordered, sides rather strongly dilated behind shoulders; 15-punctate-striate, the punctures small but distinct, intervals rather flat on disk, convex at sides, with a row of minute punctures down the centre of each. A fine microsculpture is present. *Sternum*: sterna almost impunctate, metepisterna as long as wide. *Venter* almost impunctate, segment 5 with a seta on each side. *Legs*: metacoxæ with two pores.

Length, 6–6·5 mm.; width, 4–4·2 mm.

BENGAL: Dacca (type). BIHAR: Pusa (Pusa Coll.). "Central India" (*Gen. Hearsey*—Oxford Mus.).

Type in Mr. René Oberthür's collection.

52. **Omophron smaragdus**, *Andr.* [Plate IV, fig. 4.]

Omophron smaragdus, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 405.

Colour testaceous, sterna and front margin of prothorax piceous; back and sides of head, a wide transverse patch on prothorax, extending to base and covering its central third, extending also to a broad point at middle of apex, and an elytral pattern rather bright green. The base of the elytra is green to stria 15, as are intervals 1–2 to near apex; marginal channel, and occasionally interval 15 (or even 14) testaceous. On the green ground are two irregular fasciæ and an apical patch testaceous. The front fascia reaches shoulder and is fairly wide at margin, narrowing to stria 6, contracted and sometimes interrupted on interval 10; the hind fascia, also wide at margin, extends to stria 3, interrupted on intervals 6 and 10, the central and inner parts small, the central one rather in advance of the other two; apical patch comparatively small, with short arms projecting on intervals 3–5, and 7–9.

Head flat, front nearly smooth, sides and back rather closely striate-punctate, clypeus uneven, quadrisetose, indistinctly bordered, widely emarginate, suture with an angle at middle, lobes of mentum rounded, epilobes not projecting, subocular ridges extending little beyond fissure, area in front of them finely rugose-striate. *Prothorax* moderately convex, rather coarsely coriaceous, coarsely punctate along base, more finely on disk and along front margin, base only slightly sinuate

near hind angles, sides a little rounded at about middle and faintly sinuate before angles, median line fine but distinct, not reaching extremities. *Elytra* oval, convex, base unbordered, sides rather strongly dilated behind shoulders; 15-punctate-striate, the punctures very distinct, intervals rather flat on disk, more convex at sides, a row of minute punctures down the centre of each. A fine microsculpture is present. *Sternum*: sterna at sides and prosternal plate with a few punctures, metepisterna practically as long as wide. *Venter* with a few coarse punctures at sides of base, segment 5 with a seta on each side. *Legs*: metacoxæ with two pores.

Length, 6–7 mm.; width, 4–4·4 mm.

United Provinces: Kumaon, West Almora and Ranikhet (*H. G. Champion*).

Type in British Museum.

53. **Omophron virens**, sp. n. [Plate IV, fig. 5.]

Colour testaceous yellow, sterna and front margin of prothorax piceous; back and sides of head, a transverse patch on prothorax, extending to base and covering the central half, extending also to a broad point at middle of apex, and an elytral pattern rather bright green. The marginal channel and interval 15 of the elytra are yellow, and on the green ground are two yellow irregular fasciæ and an apical patch. The front patch extends from margin to stria 7, contracted a little inwardly and indented by the green colour both in front and behind; the second patch is small and semicircular, extending from margin to stria 9, and opposite its front end is a small rounded spot, covering intervals 4 to 6; the apical patch projects obliquely inwards to about a fifth from apex, leaving a green arrow-head pointing backwards at apex on intervals 1 to 3.

Head flat, front smooth, some vague striæ near eyes, vertex and sides punctate, clypeus quadrisetose, a little emarginate and vaguely bordered in front, clypeal suture angulate, labrum slightly emarginate, mandibles short and very sharp at apex, mentum with rounded lobes, the epilobes not projecting, subocular ridge extending beyond buccal fissure, the area in front of it coarsely, though rather vaguely, striate-punctate. *Prothorax* moderately convex, rather shiny, not or only very slightly coriaceous, strongly punctate along front and hind margins, disk nearly and sides quite smooth, sides only faintly rounded and base faintly sinuate near hind angles, median line short but distinct. *Elytra* ovate, convex, base unbordered, sides moderately dilated behind shoulder; 15-punctate-striate, the punctures clearly marked and rather close together intervals moderately convex, equally wide throughout, each

with a row of punctures so fine as to be visible only under a strong lens. A fine microsculpture is present. *Sternum*: sterna coarsely but rather sparsely punctate, metepisterna a little longer than wide. *Venter* punctate at base, segment 5 glabrous. *Legs*: metacoxæ bisetose.

Length, 6·5 mm.; width, 4 mm.

UNITED PROVINCES: Haldwani (*H. G. Champion*).

Type in the British Museum. The type is a unique ♀ specimen.

As far as pattern goes, the new species bears a strong likeness to *lunatus*, but it will be readily distinguished by its green colour, more elongate form, quadrisetose clypeus, and nearly smooth elytral intervals.

54. Omophron vittatus, *Wied.* [Plate II, fig. 1.]

Scolytus vittatus, Wiedemann *, Zool. Mag. ii, 1, 1823, p. 69.
Omophron vittatus, Chaudoir, Mon. p. 56; Andrewes, Trans. Ent. Soc. Lond. 1921, pp. 174 and 188.
Omophron vittatum, Bänninger, Deutsch. Ent. Zeitschr, 1918, pp. 99 and 106.

Colour pale straw, sterna brown, pleura of both prothorax and elytra, and last two ventral segments light brown, antennæ and sides of disk of prothorax with an orange tinge; sides and back of head, a small transverse patch on middle of prothorax, bluntly pointed in front, and a series of stripes on the elytra green. The elytral stripes are on intervals 1, 2, 4, 6, 8, 10 and 13; those on 1, 2, 4, 6 and 10 extend from base to near apex, that on 13 is shortened at both ends and interrupted twice, once at a fourth from base and again at about middle, that on 8 reduced to two very small patches, one at a third from base, the other, rather longer, just behind middle.

Head flat, finely striate near eyes, coarsely but not closely punctate at sides and back, clypeus quadrisetose, unbordered, emarginate, suture with an angle at middle, mentum with rounded lobes, epilobes not projecting, subocular ridge in the form of a fine furrow, in which are one or two coarse punctures, the area behind eye coarsely punctate. *Prothorax* coriaceous on the green patch, smooth at sides, some fine punctures along front margin, more coarsely punctate along base, sides distinctly sinuate before hind angles, median line distinct, not reaching extremities. *Elytra* ovate, convex, slightly bordered at base, sides moderately dilated behind shoulder; 15-punctate-striate, striæ 7, 8, and 11 disappearing at some distance from apex, punctures clearly marked, intervals smooth and very shiny. *Sternum*: prosternal plate and base of proepisterna punctate, metepisterna smooth, hardly

longer than wide. *Venter* punctate at base, segment 5 glabrous. *Legs*: metacoxæ with a single (apical) pore.

Length, 7·5 mm.; width, 4·5 mm.

BENGAL.

Type (♀) in the University Museum, Copenhagen.

I have seen no other example of this species.

55. **Omophron oberthüri**, *Gestro*. [Plate VI, fig. 6.]

Omophron oberthüri, Gestro*, Ann. Mus. Civ. Gen. xxx, 1892, p. 962; Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 102.

Colour dark metallic green, shiny, underside piceous; labrum, palpi, antennæ, marginal channel of prothorax, a pattern on elytra, and legs testaceous. The marginal channel of the elytra is testaceous throughout (rarely interrupted at middle). The testaceous pattern includes (1) a small triangular patch rather behind shoulder, narrowing inwardly from margin to about stria 8; (2) an elongate patch running obliquely forward, at about a third from apex, moderately wide at margin, contracted to stria 9, and then sharply dilated to stria 4; (3) a small triangular apical patch, joined to the middle one along interval 15, the green colour generally reaching apex in a fine point.

Head moderately convex, closely punctate, more sparsely on middle of front, clypeus bisetose, a few punctures at its base, suture rounded, mentum uneven and pitted, lobes rounded, epilobes projecting, maxillary palpi with joint 4 quite half as long again as 3, subocular ridge sinuate, extending beyond fissure, coarsely punctate in front, a few finer punctures behind. *Prothorax* very wide, moderately convex, transversely depressed in front of base, moderately and rather closely punctate, sides gently and evenly rounded, with fairly wide, smooth, reflexed margin, hind angles right, median line obsolete. *Elytra* oval, convex, base unbordered, sides hardly widened behind shoulder, with reflexed border a little narrower than that of prothorax; 15-striate-punctate, stria 14 disappearing at a fifth from base, all striæ evanescent towards apex, intervals quite flat and very smooth. No microsculpture. *Sternum*: sterna and episterna coarsely punctate, metepisterna very nearly as wide as long. *Venter* with base coarsely punctate, the segments each with a deep depression on each side near margin, 5 bisetose. *Legs*: metacoxæ bisetose.

Length, 3·5–4·25 mm.; width, 2·4–2·6 mm.

SIKKIM: Pedong (*Desgodins*—type); Gopaldhara, Namsu, Dikchu, Tista Valley (*H. Stevens*). UNITED PROVINCES: Kumaon, West Almora (*H. G. Champion*).

Type in the Genoa Civic Museum.

Mr. Stevens writes: "I find *O. oberthüri* leaves the river beds in the rains, and at that time is occasionally to be found at the edges of paths, whereas it is common in the cold weather at the edge of the river amongst gravel and sand."

56. **Omophron chelys**, *Andr.*

Omophron chelys, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 404.

Colour very dark metallic green, shiny; sterna piceous, clypeus, middle of front, and venter (except last segment)

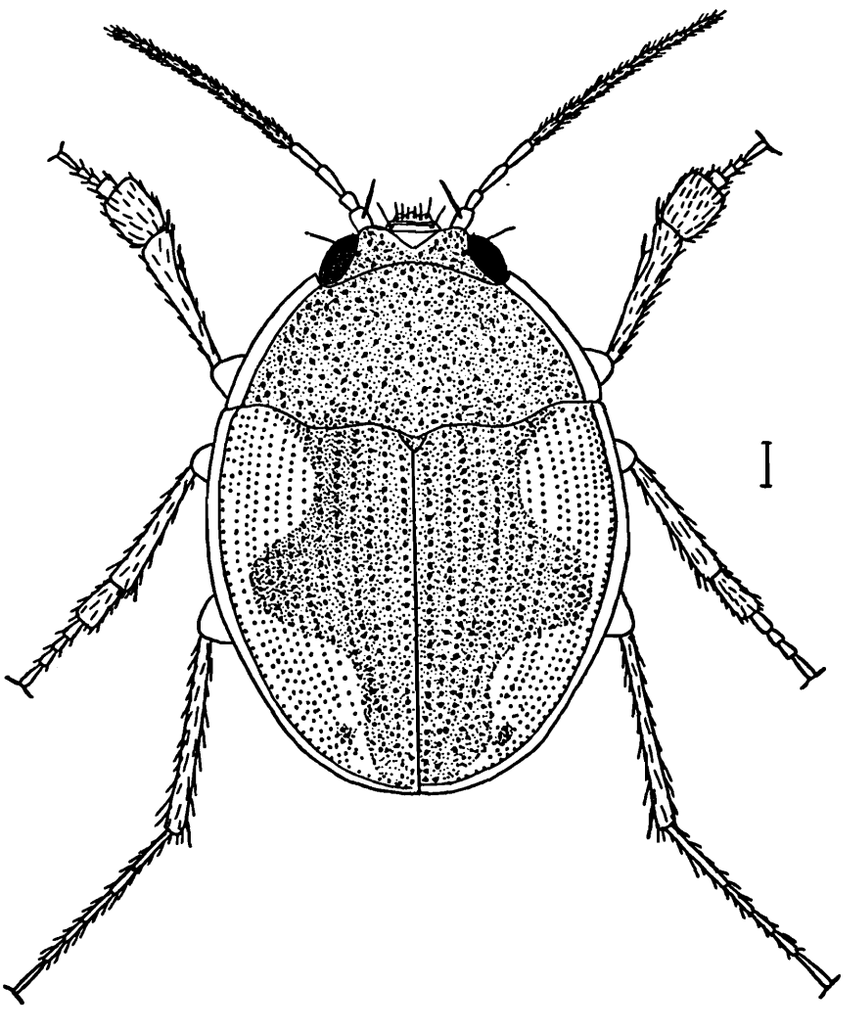


Fig. 27.—*Omophron chelys*, Andr.

brown; labrum, palpi, antennæ, side margin of prothorax, a pattern on elytra, and legs testaceous. Taking the ground-colour of the elytra as testaceous, the green pattern is in the form of a triangular patch, broad at base, where it extends on each side to stria 8, gradually narrowing to a point at apex; a broad arm on each side extends from about middle to stria 13; a small dark spot on interval 12 at about a sixth from

apex, just opposite which the triangular patch is slightly dilated. The pattern strongly resembles that of *O. axillaris*, Chaud.

Head moderately punctate at sides and back, front nearly smooth, clypeus smooth, bisetose, suture very fine, forming an obtuse angle in middle, mentum with a rounded tooth, epilobes projecting, subocular ridge extending beyond fissure, coarsely punctate in front, impunctate behind. *Prothorax* transverse, convex, moderately and nearly uniformly punctate, base bisinuate on each side, sides gently and evenly rounded, with a smooth, explanate margin, slightly reflexed, median line obsolete. *Elytra* oval, convex, base unbordered, sides slightly widened behind shoulders, with reflexed margin narrower than that of prothorax; 15-striate-punctate, striæ evanescent towards apex, 14 disappearing at a third from base, 3–4 and 7–8 at a third from apex; intervals flat and smooth. No microsculpture. *Sternum*: sterna and episterna coarsely punctate, metepisterna as wide as long. *Venter* with sides of base coarsely punctate, the segments not depressed at sides, 5 bisetose. *Legs*: metacoxæ bisetose. In the protarsi ♂ joint 1 is in the form of an enormous oblong plate, practically as long as 2–5 together, and twice as wide as the tibiæ, joint 2 slightly dilated; joint 1 of mesotarsi elongate, as long as 2–4 together and as wide as tibiæ.

Length, 4 mm.; width, 2·7 mm.

SIKKIM: Gopaldhara at 3500 ft. (*H. Stevens*).

Type (♂) in my collection.

The type is the only example of this species I have seen.

57. **Omophron gemmeus**, *Andr.* [Plate V, fig. 1.]

Omophron gemma, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 406.

Omophron gemmeus, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 190.

Colour moderately bright metallic green, shiny; sterna piceous, venter rather lighter; clypeus and labrum dark red; palpi, antennæ, middle of front, side margins of prothorax and elytra, and legs testaceous. The testaceous margin of the elytra has a very irregular inner edge; it extends at base to stria 11, contracts midway to 12, expands sharply to 8, contracts again to about 10, and reaches apex by an irregular curved line.

Head moderately punctate, more sparsely on middle of front, clypeus smooth, bisetose, suture very fine, almost arcuate, mentum with rounded lobes, epilobes forming a sharp point at extremities, subocular ridge extending beyond fissure, coarsely punctate in front, impunctate behind. *Prothorax* moderately punctate, rather sparsely on disk, base bisinuate

on each side, sides evenly rounded, with smooth, slightly reflexed margin, median line nearly obsolete. *Elytra* oval, convex, base unbordered, sides slightly widened behind shoulder, with narrow reflexed margin ; 13-striate-punctate, 1–12 clearly marked at base, 13–14 obsolete (or represented by one or two punctures only close to base), 11–12 disappearing at a half, and the remaining striæ becoming evanescent at two-thirds from base, intervals flat and smooth. No microsculpture. *Sternum* : sterna and episterna coarsely punctate. *Venter* with a few punctures near base, segment 5 bisetose. *Legs* : metacoxæ bisetose.

Length, 3·75–4 mm. ; width, 2·8 mm.

United Provinces : Kumaon, West Almora (*H. G. Champion*).

Type in the British Museum.

58. **Omophron brettinghamæ**, *Pasc.*

Omophron brettinghamæ, Pascoe *, Journ. Ent. i, 1, 1860, p. 38; Chaudoir, Mon. p. 56; Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 102 : Andrewes, Trans. Ent. Soc. Lond. 1919. p. 195.

Omophron levigatus, Gestro *, Ann. Mus. Civ. Gen. xxvi, 1888, p. 172; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 269; Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 102.

Colour very dark metallic green, shiny ; sterna piceous, clypeus and middle of front dark red , labrum, palpi, antennæ, side margins of prothorax (wider at apex than at base) and elytra, apex of venter, and legs testaceous. The testaceous margin of the elytra has an irregular inner edge ; it extends at base to stria 11 or 12, expands gradually and midway reaches 10, behind which is a slight expansion to 8 or 9, followed by a contraction to 10, thence by a wavy line to a point a little in advance of apex, the actual suture being dark to apex.

Head sparsely punctate, smooth in middle, clypeus smooth, bisetose, suture with an angle at middle, mentum with rounded lobes, rather sharp at apex, subocular ridge deep, extending well beyond buccal fissure, surface between it and eye coarsely punctate. *Prothorax* rather finely and not very closely punctate, base bisinuate on each side, sides very gently and evenly rounded, margin smooth, a little reflexed, median line obsolete. *Elytra* oval, convex, base unbordered, sides a little widened behind shoulders, margin narrowly reflexed ; 13-striate-punctate, the punctures rather fine, 1–12 clearly marked at base, 13–14 represented by one or two punctures only close to base, 11 disappearing at about a third from base, and the rest evanescent at a third from apex, intervals flat and smooth. No microsculpture. *Sternum* : sterna and episterna coarsely punctate, metepisterna as long as wide, with a few punctures

only. *Venter* with some punctures at base, segment 5 bisetose. *Legs*: metacoxæ with one (apical) seta.

Length, 3·5–4 mm.; width, 2·4–2·6 mm.

BENGAL: Dacca (*Mrs. Brettingham*—type). BURMA: Teinzo (*L. Fea*).

Type in the British Museum, that of *O. levigatus* in the Genoa Civic Museum.

The elytral pattern in this species, of which I have seen four examples, is rather variable. A cotype of *levigatus* in my collection agrees well with the type of *brettinghamæ*, but in the type of *levigatus* the testaceous border of the elytra is more indented, and the puncturation of the upper surface is more marked. A second cotype of *levigatus* in the Genoa Museum requires a special note. In this example stria 13 is as well developed as the other striæ, and even stria 14 extends to quite a fourth from base; all the striæ and punctures are more strongly impressed, especially at base, than in the type. The green colour on the elytra extends at middle to stria 13, and the line along which the colours unite is even more jagged than in the type. The three specimens of *levigatus* were all taken at Teinzo, and apparently at the same time; until more material is available, I can only note these abnormal characters, which seem to connect the species with the preceding group.

The *O. brettinghamæ*, Gestro (not Pasc.) (Ann. Mus. Civ. Gen. xxx, 1892, p. 964), is an example of a larger and at present undescribed species; it is in such poor condition that it is unsuitable to be made the type of a new species.

59. Omophron bicolor, *Andr.* [Plate V, fig. 2.]

Omophron bicolor, Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, p. 292.

Colour metallic green, sometimes bluish, shiny; sterna piceous, middle of front, clypeus, labrum, palpi, antennæ, a broad margin to prothorax and elytra, venter, and legs flavous. The middle third of the prothorax is green, but the colour extends some little way along base towards sides. The flavous border of the elytra is wide and its inner edge irregular; it reaches stria 9 at base, contracts to 10 at a third, expands again to 7 at a half, and contracts to 9 at two-thirds; the green colour, pointed at extremity, does not quite reach apex, and the line of junction of the two colours is a little jagged throughout.

Head rather finely punctate at sides and back, smooth in middle, clypeus smooth, bisetose, emarginate in front, suture with a blunt angle at middle, surface of mentum more or less pitted, subocular ridges clearly marked, the area in front of

them coarsely punctate. *Prothorax* moderately and nearly uniformly punctate, transversely depressed along base, which is bisinuate on each side, sides gently and evenly rounded, marginal channel rather narrow, smooth, median line practically obsolete. *Elytra* oval, convex, base unbordered, sides gently widened behind shoulder; 13-striate-punctate, the punctures rather fine, 1–12 clearly marked at base, traces only of the normal 13–14 visible near base, 11 disappearing at a half, the remainder evanescent towards apex, intervals flat and smooth. No microsculpture. *Sternum*: sterna coarsely punctate, metepisterna as long as wide, with a few punctures only. *Venter* slightly punctate at base, segment 5 bisetose. *Legs*: metacoxæ bisetose.

Length, 3·75–4 mm.; width, 2·75–3 mm.

BENGAL: Dacca (type); Calcutta, at light (*F. H. Gravely*).

Type in the British Museum.

60. **Omophron axillaris**, *Chaud.* [Plate V, fig. 3.]

Omophron axillaris, Chaudoir*, Mon. p. 60; Bänninger, Deutsch. Ent. Zeitschr. 1918, p. 103.

Colour testaceous, shiny; sterna and base of venter piceous; sides and back of head, a broad transverse patch along base of prothorax, occupying two-thirds of the area, reaching at sides to marginal channel, and prolonged narrowly in front to a point at middle of apex, and an elytral pattern of a rather bright green (sometimes bluish). The elytral pattern consists of an elongate triangular patch, broad at base, where it extends almost to shoulder, but contracting rapidly to stria 7, thence (apart from the arms thrown out) the sides are parallel to a fourth from apex, and then contract to a point at apex; a broad arm is thrown out on each side just behind middle, reaching stria 13, but constricted on interval 9, and a little behind this a second narrow oblique arm, which stretches backwards and also reaches stria 13.

Head rather coarsely punctate at sides and back, smooth at sides of front and along middle line, clypeus nearly smooth but with some faint cross-striation, bisetose, unbordered, suture with a blunt angle at middle, mentum lightly striate, lobes rounded and sharp at apex, ligula separated from paraglossæ by a very small notch, subocular ridges barely indicated behind buccal fissure, a large area at side of head coarsely punctate. *Prothorax* transversely depressed along base, rather coarsely but not very closely punctate, the punctures large and confluent at sides of base, which is bisinuate on each side, sides very slightly rounded, marginal channel very shiny, nearly smooth, front angles rather shortly produced, though

acute, hind angles right, median line fine, not nearly reaching either base or apex. *Elytra* oval, convex, base unbordered, sides moderately widened behind shoulder; 15-punctate-striate, punctures large and clear, 11 disappearing at a half, 3–4 and 7–8 at about three-fourths, intervals smooth, nearly flat on disk, convex at sides. A fine but vague microsculpture is present. *Sternum*: sterna and episterna coarsely punctate, metepisterna as long as wide. *Venter* coarsely punctate on basal segment, 5 bisetose. *Legs*: metacoxæ bisetose.

Length, 6–7 mm.; width, 3·6–3·9 mm.

Bengal (*Dr. Bacon*—type). United Provinces: Kumaon, West Almora, Swal River Basin (*H. G. Champion*). Punjab: Simla, Kotkhai, 5500 ft. (*C. F C. Beeson*).

Type in Mr. René Oberthür's collection.

An unusually elongate example in the Oxford University Museum, labelled "India (*Boys*)" has the dark markings of the upper surface with a distinct bluish tinge.

61. Omophron rotundatus, *Chaud.* [Plate V, fig. 4.]

Omophron rotundatus, Chaudoir*, Bull. Mosc. 1852, i, p. 101; id., Mon. p. 55; Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, p. 292.

Omophron rotundatum, Bänninger, Deutsch. Ent. Zeitschr. 1915, p. 232; id., Deutsch. Ent. Zeitschr. 1918, p. 103.

Colour testaceous, shiny; sterna piceous, a patch on each side of prothorax, metepisterna, and venter brown; sides and back of head, a transverse patch in middle of base of prothorax, occupying half the width and two-thirds of the length, continued narrowly along median line to near apex, and an elytral pattern dark green (sometimes bluish). The elytral pattern consists of a sutural stripe, covering the first three intervals at base and tapering to a point at apex; from this stripe are thrown out two arms on each side, the front one at about a third from base, fairly wide and reaching stria 6, the hind one at about a third from apex, narrower and of variable form, generally reaching stria 8, and often continued obliquely backwards to stria 12; in addition there is a squarish basal spot, covering intervals 8–12 (very often reduced in size, or even wanting), and a round spot on each side, level with the front arms and covering intervals 9–13; the base is sometimes narrowly infuscate.

Head coarsely punctate at sides and back, front smooth, clypeus nearly smooth, bisetose, unbordered, suture almost rounded, mentum with lobes subtruncate in front, apex sharp but not projecting, ligula separated from paraglossæ by a very small notch, subocular ridges barely indicated, a large area at sides coarsely punctate. *Prothorax* slightly depressed

along base, rather coarsely and irregularly punctate, the punctures larger and a little confluent at sides of base, which is emarginate on each side, the usual sinuation near hind angles almost imperceptible, sides very slightly rounded, marginal channel nearly smooth, front angles shortly produced but acute, hind angles about right, median line fine, not reaching extremities. *Elytra* oval, convex, base unbordered, sides strongly dilated behind shoulders; 15-punctate-striate, punctures distinct and rather close together, striæ 3–4, 7–8, 11, and 13–14 all disappearing at about a fourth from apex, intervals smooth, nearly flat on disk, convex at sides. The microsculpture is conspicuous and consists in isodiametric meshes. *Sternum*: sterna coarsely punctate, metepisterna as wide as long, with a few large punctures along hind and inner margins. *Venter* smooth, though slightly punctate at sides of base, segment 5 bisetose. *Legs*: metacoxæ bisetose.

Length, 6–7 mm.; width, 3·5–4 mm.

UNITED PROVINCES: Mussoorie, 7000 ft. BALUCHISTAN: Quetta (*Webb-Ware*—Ind. Mus.). MESOPOTAMIA. ARABIA. PALESTINE. ASIA MINOR. PERSIA. TURKESTAN. CHINA.

Type in Mr. René Oberthür's collection.

A specimen in the Oxford University Museum is labelled "Capt. Boys" and presumably comes from North India.

In examples from Annam (Coll. Bänninger) and Fokien in China the elytral pattern is much reduced, and in particular the posterior arms are represented by two small spots only on intervals 7–8. I regard this form as merely a local variation.

One more species of *Omophron* must be mentioned, because it has been described, but it is unrecognizable and the type is lost:—

"*Omophron suturalis*, Gistl, Naturgeschichte des Thierreichs, 1848, p. 112.

"Entirely yellow; head and prothorax black, an oblong, four-cornered, red spot on the scutellum, and four connected black spots; elytra yellow, with fine black striæ. Twice as large as *O. limbatus*. Antennæ yellow. Bengal."

Group VII. OZÆNINI.

Representatives of this tribe are found both in the Old and New Worlds: the genera are more numerous in the former, the species in the latter, and more particularly in South America. One genus occurs in Madagascar and one in Australia; while five are found in South-East Asia, of which only three are represented in India, each one with a single species.

Body pedunculate, mandibles without seta in the scrobe, no specialized supraorbital setæ (though pubescence is usually

present), mentum toothed (except in *Eustra*), antennæ pubescent, but only fully so from joint 5, basal border of elytra extending only from shoulder to peduncle, side border interrupted at about a third from apex, usually notched, procoxal cavities closed behind, both meso- and metacoxæ narrowly separated (at least in Indian genera), protibiæ deeply emarginate on inner side, both spurs terminal.

Key to the Genera.

1 (4)	Mentum with a well developed tooth, outer margin of buccal fissure forming a plate, visible from above, joint 11 of antennæ shorter than 9+10.	
2 (3)	Ligula bisetose, enveloped by paraglossæ, genæ embracing eyes behind, interruption of elytral border behind formed by an oblique ridge and notch...	ITAMUS, Schm.-Goeb., [p. 163.
3 (2)	Ligula 4-setose, not enveloped by paraglossæ, genæ not embracing eyes behind, interruption of elytral border behind formed by a flattening of the border against the elytra, without notch ..	ANENTMETUS, Andr., [p. 166.
4 (1)	Mentum with tooth wanting or rudimentary, outer margin of buccal fissure not forming a plate visible from above, joint 11 of antennæ=8+9+10	EUSTRA, Schm.-Goeb., [p. 167.

Genus **ITAMUS.**

Itamus, Schmidt-Goebel, Faun. Col. Birm. 1846, p. 67; Lacordaire, Gen. Col. i, 1854, p. 160; Chaudoir, Bull. Mosc. 1854, i, p. 297; Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, p. 295; Bänninger, Deutsch. Ent. Zeitschr. 1927, pp. 191 and 202.

TYPE, *Itamus castaneus*, Schm.-Goeb. (India, Burma, Indo-China).

Head large, bordered at sides, eyes embraced behind by the genæ, which are pubescent and do not project beyond the eyes, widely separated from buccal fissure, of which the outer side is dilated into a plate, visible from above; clypeus bisetose, emarginate, with a well marked suture, labrum plurisetose, truncate or slightly emarginate; mandibles stout, hooked and sharp at apex, right one with a strong tooth, left one with a smaller tooth at middle; ligula narrow, bisetose, carinate beneath, completely surrounded by the paraglossæ, which are corneous or membranous, their margin microscopically setulose; mentum with a deep sinus and a wide tooth, epilobes wide; maxillæ curved, sharp and slightly hooked at apex, densely ciliate within almost to apex, outer lobe jointed; palpi short, thick, cylindrical, setulose, truncate at apex,

labials with joint 2 plurisetose on inner margin; antennæ thick, submoniliform, dilated and flattened towards apex. *Prothorax* cordate, sides explanate, plurisetose, front angles prominent and very sharp. *Elytra* 9-striate, no scutellary striole, odd intervals seriate-punctate, border behind interrupted by a short oblique finely sulcate ridge, with an indentation in the outline just in front of it. *Sternum*: prosternal process convex and pubescent behind, metepisterna long and narrow, last tergite convex, falling at a right angle on apex of venter. *Legs* fairly stout, profemora with a ridge beneath, which sometimes bears a tooth near base, tarsi short and compact, protarsi with the joints produced a little outwardly, not dilated in the ♂, claws smooth. (I have not been able to detect on the underside of the ♂ protarsi the scales mentioned by the author. He does not say which joints are so clothed, but it is probably the first two, as in the other genera.) The surface of the body is sparsely pubescent.

Range. India, Burma, Laos, Tonkin. Only two species are known—*I. castaneus*, Schm.-Goeb., and *I. dentatus*, Andr.; of these only the first occurs in the Indian region.

62. Itamus castaneus, *Schm.-Goeb.*

Itamus castaneus, Schmidt-Goebel *, Faun. Col. Birm. 1846, p. 67; Chaudoir, Bull. Mosc. 1854, i, p. 297; id., Révision du groupe des Ozénides, Ann. Soc. Ent. Belg. xi, 1868, p. 51; Bates, Compt. rend. Soc. Ent. Belg. 1891, p. 326; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 269; Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, pp. 295 and 296; id., Trans. Ent. Soc. Lond. 1923, p. 38; Bänninger, Deutsch. Ent. Zeitschr. 1927, p. 202.

Colour chestnut brown, sometimes brown, shiny; mandibles, antennæ, tibiæ, and tarsi brown.

Head wide, slightly convex, finely longitudinally striate at sides; clypeus with a short longitudinal groove in middle behind, labrum truncate, 8- or 10-setose along front margin; tooth of mentum moderately sharp, about half as long as lobes; paraglossæ completely fused with ligula and forming a corneous whole, rounded in front, with a carina placed in a groove and running from base to apex of the ligula; labial palpi with joint 2 longer than 3, maxillary palpi with joint 4 three times as long as 3; eyes not prominent, about as large as genæ, which slope rather gently backwards, neck hardly perceptibly constricted. *Prothorax* slightly convex, about a third wider than long, base truncate, apex emarginate, a fourth wider than base, widest not far from front angles, sides very gently rounded in front and sinuate a long way from base, rather widely explanate and a little reflexed, with

half a dozen setæ along the margin, angles very sharp, front ones acute, hind ones rectangular; median line moderate, transverse impressions rather deep, surface with some vague transverse striation, and sometimes subrugose, more distinctly so across base. *Elytra* moderately convex, a little wider than prothorax and nearly twice as long as wide, parallel but slightly contracted at base, border forming a short tooth at shoulder; striæ only moderately deep and rather vaguely punctate, intervals moderately convex, odd ones with 6 to 8 punctures on middle of interval, but 1 with two or three only, marginal series uninterrupted; surface nearly smooth. *Venter* nearly smooth along median line, but elsewhere punctate and pubescent. *Legs* with the tibiæ carinulate, setulose, as is the upper surface of the tarsi, the setæ golden yellow.

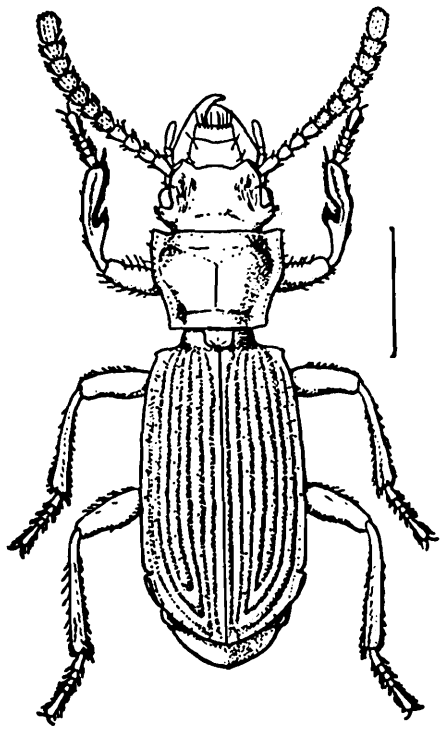


Fig. 28.—*Itamus castaneus*, Schm.-Goeb.

Length, 10–13 mm.; width, 3–3·5 mm.

CHOTA NAGPUR. ASSAM: Sadiya (*S. W Kemp*—Ind. Mus.). MADRAS: Madras (*F H. Gravely*). BURMA: Tenasserim (Brit. Mus.); Bhamo, Katha, Prome, Mandalay (all *L. Fea*); Kaing River, Pyinmana (*C. F C. Beeson*—Forest Res. Inst.). ANDAMAN Is. (*E. T. Atkinson*—Brit. Mus.). LAOS (*R. Vitalis de Salvaza*).

Type in the Prague Museum.

Dr. Kemp's specimen was taken in rotten wood.

Genus **ANENTMETUS.**

Anentmetus, Andrewes, Ann. Mag. Nat. Hist. (9) xiv, 1924, p. 585; Bänninger, Deutschr. Ent. Zeitschr. 1927, pp. 190 and 191.

TYPE, *Anentmetus pluto,* Andr. (India.)

Head large, narrowly bordered at sides, eyes widely separated from buccal fissure, genæ slight, glabrous, not embracing eyes behind, outer side of buccal fissure dilated into a plate, visible from above; clypeus narrowed in front, strongly emarginate, without setæ, suture well marked, labrum slightly emarginate, plurisetose; mandibles short and wide, slightly hooked and sharp at apex, several setæ placed along the lower margin of scrobe; ligula narrow, 4-setose, paraglossæ wide, leathery, extending a little beyond ligula but not enveloping it, the border microscopically setulose; mentum with a deep sinus and a sharp bordered tooth, epilobes wide, extending to apex of both lobes and tooth; maxillæ curved, sharp, slightly hooked at apex, densely ciliate within, almost to apex, outer lobe jointed; palpi short, thick, apical joint setulose, truncate at apex, a little dilated in maxillaries and fully twice as long as 3, securiform in labials and a little longer than 2, which is bisetose on inner margin; antennæ short, thick, flattened, joint 11 about half as long again as 10. *Prothorax* cordate, sides explanate, without setæ, front angles rounded, not produced. *Elytra* 9-striate, without scutellary striole, intervals without punctures, border behind strongly reflexed for a short distance at about apical fourth and pressed tightly against the elytra, without notch. *Sternum*: prosternal process glabrous, not bordered, metacoxæ almost but not quite contiguous. *Venter* sparsely setulose at sides, penultimate segment with a transverse row of setæ, last one (♂) with a number of setæ disposed in a semicircle round apex, last tergite very convex, overhanging and extending rather beyond venter. *Legs* short but strong, profemora sulcate beneath, tibiæ carinate, pubescent, tarsal joints short, pubescent on upper surface, pro- and mesotarsi ♂ with joints 1 and 2 slightly dilated and clothed beneath with scales, claws smooth. Upper surface very finely punctulate, but not pubescent.

Range. India and Indo-China. Only two species are known, one from each region.

63. **Anentmetus pluto,** *Andr.*

Anentmetus pluto, Andrewes *, Ann. Mag. Nat. Hist. (9) xiv, 1924, p. 586.

Colour piceous black: underside, palpi, joint 1 of antennæ, and legs brown red.

Head slightly convex, frontal impressions short and shallow, sides of front with some fine longitudinal striation, labrum

7-setose, eyes large and prominent, antennæ reaching base of prothorax, surface punctate, clypeus very finely, neck more coarsely, vertex almost smooth. *Prothorax* slightly convex, a little wider than head and two-thirds wider than long, base truncate, with its sides rather oblique, a little narrower than apex, which is faintly emarginate, widest at about apical fourth, sides a little reflexed, gently rounded and sinuate rather before base, front angles rounded, hind ones sharply rectangular and projecting laterally; median line fine, transverse impressions both deep, surface finely punctate, with some transverse striation across base. *Elytra* moderately convex, parallel, a little wider than prothorax, twice as long as wide, border rounded at shoulder, smooth and glabrous, striæ shallow, finely and indistinctly punctate, intervals only

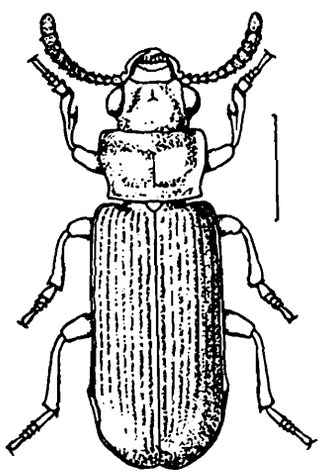


Fig. 29.—*Anentmetus pluto*, Andr.

slightly convex, a little more so near base, finely punctate, punctures of marginal series hardly interrupted, but not very close together. The whole of the upper surface is covered by a very fine, nearly isodiametric microsculpture.

Length, 10 mm.; width, 3 mm.

UNITED PROVINCES: Haldwani (*H. G. Champion*). MADRAS: Madras (*F. H. Gravely*).

Type in the British Museum.

Genus **EUSTRA**.

Eustra, Schmidt-Goebel, Faun. Col. Birm. 1846, p. 65; Lacordaire, Gen. Col. i, 1854, p. 161; Chaudoir, Bull. Mosc. 1854, i, p. 309; id., Révision du groupe des Ozénides, Ann. Soc. Ent. Belg. xi, 1868, p. 71; Bates, Trans. Ent. Soc. Lond. 1873, p. 237; Lewis, Ent. Month. Mag. xviii, 1881, p. 39; Andrewes, Ann. Mag. Nat. Hist. (9) iv, 1919, p. 295; Bänninger, Deutsch. Ent. Zeitschr. 1927, pp. 189 and 206.

TYPE, *Eustra plagiata*, Schm.-Goeb. (India, Burma, Sumbawa, Formosa.)

Head rather large and convex, narrowly bordered at sides, eyes separated from buccal fissure, the genæ strongly pubescent, but not embracing the eyes behind : both clypeus and labrum plurisetose, clypeal suture fine, though clearly marked, labrum narrowed in front, its margin denticulate : mandibles fairly stout and sharp, with a tooth at middle : ligula small, truncate at apex, quadrisetose, paraglossæ wanting or fused with ligula ; mentum with a moderately deep sinus, the tooth wanting or rudimentary, epilobes narrow : maxillæ narrow, sharp, curved, densely ciliate within to near apex, outer lobe jointed, slender ; palpi short, setulose, acuminate at apex, maxillaries with joint 4 twice as long as 3, labials with joint 2 bisetose on inner margin ; antennæ moniliform, dilated towards apex, joint 1 also dilated, 11 as long as 8+9+10. *Prothorax* cordate (except *bryanti*), sides explanate, border minutely setulose and sometimes denticulate, front angles acute and prominent. *Elytra* subtruncate at apex, border setulose, slightly dentate, at least near shoulder, interrupted at outer angle of truncature by a raised tooth, with an incision just in front of it, no striæ, surface asperate-punctate. *Sternum* : metepisterna long and narrow. *Legs* fairly stout, tarsi short and compact, the joints almost moniliform, 2 to 4 somewhat oblique, protarsi ♂ hardly dilated, though joint 1 has an inflated appearance, 1 and 2 clothed irregularly with scales beneath, claws smooth. Surface of body more or less pubescent.

Range. India, Burma, Borneo, Sumbawa, Formosa, Japan. Of the four described species only one occurs in the Indian region.

Nothing is known of the habits of *E. plagiata*, except its occurrence in rotten wood, but the closely-allied species *E. japonica*, Bates, was taken by Mr. George Lewis in Japan both under stones and under the bark of decaying trees. Mr. Lewis also notes : "This little beetle hibernates under flattish stones, 17 or 18 inches in diameter, choosing those for its retreat which are partially embedded in the soil, and well hidden away in the shelter of shady thickets. It is never found under loose stones nor under those out in the open, exposed to the rays of the sun. *Eustra* is gregarious, associating in little groups of three, five, or eight, and, when the stone is overturned, the insects are found close together, adhering to the surface of it, never on the earth. Their mode of running and habit of life remind one of *Crepidogaster* or one of the crepitating Carabidæ, ; but anatomists who study the group place them far away from the Brachyninæ."

64. Eustra plagiata, *Schm.-Goeb.*

Eustra plagiata, Schmidt-Goebel *, Faun. Col. Birm. 1846, p. 66, t. 3. f. 1; Chaudoir, Bull. Mosc. 1854, i, p. 310; id., Révision du groupe des Ozénides, Ann. Soc. Ent. Belg. xi, 1868, p. 71; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 269; Dupuis, Ann. Soc. Ent. Belg. 1913, p. 418; Andrewes, Ann. Mag. Nat. Hist. (9) iv 1919, pp. 295 and 299; id., Trans. Ent. Soc. Lond. 1923, p. 37.

Colour yellow-brown, head and prothorax sometimes reddish, elytra with a fairly large, ill-defined, dark spot on apical third.

Head large, convex, very nearly as wide as prothorax, neck moderately constricted, eyes not prominent, antennæ fairly long, reaching beyond base of prothorax, labrum somewhat rounded in front, 8-setose, the setæ arising each from a minute

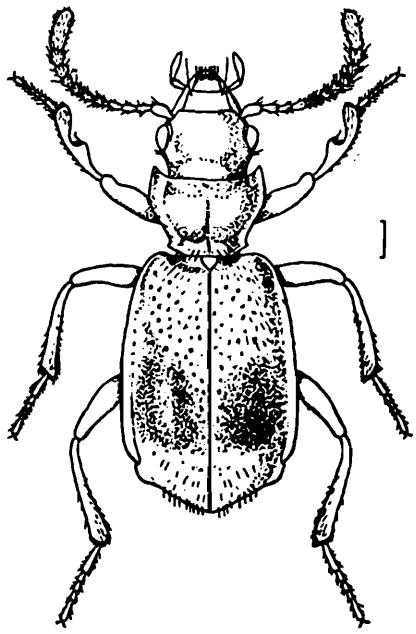


Fig. 30.—*Eustra plagiata*, Schm.-Goeb.

denticulation, mentum with a rudimentary tooth, surface nearly smooth. *Prothorax* cordate, moderately convex, not quite a third wider than long, base with its sides oblique, apex rather deeply emarginate, a fourth wider than base, widest at about apical third, sides rather gently rounded and sinuate not very far from base, margin somewhat explanate and reflexed, plurisetose, border minutely tuberculate but not dentate, angles very sharp, front ones acute, hind ones slightly obtuse, front transverse impression shallow, hind one and median line fairly deep, surface nearly smooth. *Elytra* subquadrate, moderately convex, nearly two-thirds as wide again as prothorax, not quite half as long again as wide, a little dilated behind and more or less truncate at apex, the sides rather compressed behind middle, border rounded at shoulder,

setulose and slightly denticulate, at least behind shoulder, surface covered (though not closely) with asperate punctures, each bearing a seta, generally also with the appearance of large brown underlying pores. *Legs*, and more especially the tibiæ near apex, clothed, like the rest of the body, with yellowish pubescence.

Length, 2·5–4 mm.; width, 1·2–1·8 mm.

ASSAM: Kobo, 400 ft. (*S. W Kemp*—Ind. Mus.). MADRAS: Nilgiri Hills, Ouchterlony Valley (*H. L. Andrewes*). BURMA: Teinzo and Palon (*L. Fea*). SUMBAWA (*W Doherty*). FORMOSA (*H. Sauter*).

Type in the Prague Museum.

Dr. Kemp's specimen was taken in rotten wood.

Group VIII. LORICERINI.

The group contains only the palæarctic genus *Loricera* and the very closely-allied *Elliptosoma*, Wollaston, from Madeira. It is characterized by having the procoxal cavities closed behind, the mesosternum without carina, the mandibles without any seta in the scrobe, the protibiæ deeply emarginate on the inner side towards apex, with the variable spur at the base of the emargination, the antennæ with joints 2–4 of irregular shape, with long bristles attached to them, the scutellum visible, the elytra 12-striate.

Genus **LORICERA.**

Loricera, Latreille, Hist. Nat. Crust. et Ins. iii, 1802, p. 88; Dejean, Spec. Gen. ii, 1826, p. 292; Lacordaire, Gen. Col. i, 1854, p. 214.

Lorocera, Bedel, Ann. Soc. Ent. Fr. 1878, p. 248; id., Faune Col. Bassin de la Seine, i, 1879, p. 50; Ganglbauer, Käf. Mitteleur. i, 1892, p. 125; Rousseau, Gen. Col., Fasc. 86, Lorocerinæ, 1908, p. 2.

TYPE, *Carabus pilicornis*, F (Europe, Siberia, and North America.)

Head wide, sharply contracted behind and constricted round neck, setose beneath, also contracted in front and furrowed along median line, eyes prominent, narrowly separated from buccal fissure, with a single supraorbital pore; clypeus bisetose, suture curved and deep, slightly emarginate in front, labrum sexsetose, cut away at sides so that the front is narrow, a little emarginate, with two setæ beneath margin, and two setæ on each side,; mandibles short, wide, and very flat, with a deep excision on outer side near base, rounded and sharply pointed in front, slightly toothed near base; ligula bisetose, obtusely angled in front, fused with the paraglossæ which project a little on each side in front; mentum

emarginate, with a short, wide, obtuse tooth, setose along margin, lobes moderately rounded, epilobes small, hardly projecting in front; maxillæ slender, hooked, and very sharp at apex, stipes dilated externally into a large plate, deeply notched near apex, visible from above, and bearing a number of long setæ; palpi small, slender, and but little dilated, compressed at apex and hardly truncate, maxillaries with joint 4 much longer than 3, labials with joint 2 elongate and bisetose on inner margin; antennæ reaching middle of elytra, setose from joint 5, 1 thick, unisetose, equal to 2, 3, and 4 together, 2 and 5 very short, 4 a little longer, 3 and 6 to 11 of about equal length, 2 to 4 tuberculate, with a stiff bristle arising from each tubercle. *Prothorax* cordate, transverse, rather wider than head, with a single marginal seta on each side just behind middle. *Elytra* oval, with bordered base, the margin entire behind, 12-striate, without scutellary striole. *Sternum*: mesosternum channelled, metepisterna longer than wide. *Venter*: segments 3 to 6 with a single seta on each side of middle (♂ ♀). *Legs* slender and sparsely spinulose, tibiæ very thin, tarsi glabrous on upper surface, joint 1 in meso- and metatarsi as long as or longer than 2 and 3 together, protarsi ♂ with joints 1 to 3 dilated and clothed beneath with a pad of white scaly hairs, claws smooth.

Range. Palæarctic and nearctic regions, extending southwards in the former to the Himalayas and in the latter to Mexico. The insects are found on the banks of streams and lakes, or in other moist situations under moss, leaves, etc.

Nothing is known of the early states of the two Indian species, but the larva of *L. pilicornis* has been described by Schiødte (Nat. Tidsskr. 1867, p. 465, t. 14. ff. 8–16) and by Gernet (Hor. Soc. Ent. Ross. 1867, p. 4, t. 1. f. 2). Rousseau has figured both larva and pupa.

Key to the Species.

1 (2) Black, with a greenish tinge, hind angles of prothorax obtuse but sharp, intervals of elytra nearly flat on disk. Length 8 mm. . . . . *stevensi*, Andr., p. 171

2 (1) Black, hind angles of prothorax obtuse but slightly rounded, intervals of elytra convex on disk. Length 9 mm. . . *aparupa*, Andr., p. 173.

65. Loricera stevensi, *Andr.*

Lorocera stevensi, Andrewes *, Ann. Mag. Nat. Hist. (9) v, 1920, p. 449.

Colour black, with a faint greenish tinge; mandibles, palpi, joints 2–11 of antennæ, and tarsi testaceous red; tibiæ and pro- and mesotrochanters red; joint 1 of antennæ piceous.

Head smooth, frontal impressions deep, confluent behind, a deep longitudinal furrow between front and neck, some fine oblique striæ on sides of front, labrum semi-hexagonal, the median part narrow, slightly emarginate, an obtuse angle between it and the oblique sides, antennæ with joint 1 attenuated at base, obliquely truncate at apex, 2 to 4 strongly tuberculate and provided with long bristles, 5 to 6 with rather long and much finer bristles at apex. *Prothorax* moderately convex, widest at middle, slightly emarginate at extremities, a little more contracted behind than in front, sides regularly rounded, with reflexed border, distinctly indented by the marginal pore, front angles rounded, hind angles obtuse but sharp ; median line and hind transverse impression distinct, the front one and the little pits on each side of disk in front only faintly indicated ;

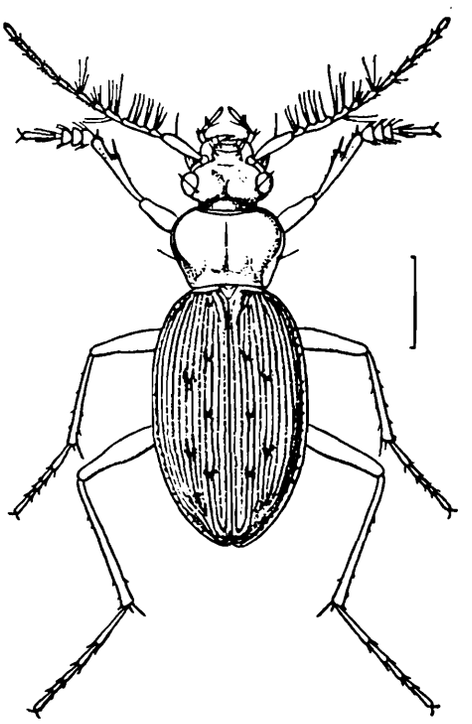


Fig. 31.—*Loricera stevensi*, Andr.

surface smooth, base moderately punctate. *Elytra* elongate-oval, very nearly twice as long as wide, shoulders very oblique ; striation moderate, the striæ finely but not very conspicuously punctate, 3 and 4 each with an umbilicate pore at base ; intervals rather convex at sides, nearly flat on disk, three large punctures on 4, at a fourth, a half, and two-thirds from base, two similar punctures on 7, at a third and two-thirds from base, 2 a little dilated at base. *Sternum* : episterna (except middle of proepisterna) and sides of metasternum punctate. *Venter* punctate at sides of base.

Length, 8 mm. ; width, 2·5 mm.

SIKKIM : Tonglu, 10,000 ft. (*H. Stevens*).

Type in my collection.

66. Loricera aparupa, *Andr.*

Lorocera aparupa, Andrewes*, Ann. Mag. Nat. Hist. (9) v, 1920, p. 450.

Closely allied to *L. stevensi*, but differing in its larger size, wider form, and in the following particulars. *Colour* black, without any green tinge. *Head* rather wider and flatter in front, the frontal foveæ shallower, the front a little more noticeably, though still finely striate. *Prothorax* more transverse, hind angles obtuse and a little rounded, the pits on sides of disk in front obsolete, base a little more closely punctate. *Elytra* less elongate, shoulders rather less oblique, intervals more convex, 4 and 10 a little more so than the others, the front puncture on 7 wanting (but in the ♂ specimen it is present on the right elytron). *Sternum*: front of proepisterna impunctate.

Length, 9 mm.; width, 3 mm.

UNITED PROVINCES: Kumaon, West Almora Division, Sunderdhunga Valley, 8000–12,000 ft., 2 ex. ♂ ♀ (*H. G. Champion*).

Type in the British Museum.

Group IX. SIAGONINI.

There are two genera in the group, *Siagona* and *Luperca*. The form is elongate and flat, the body pedunculate. The antennæ arise on each side under a lateral ridge, joint 1 being long and more or less clavate; the head above the buccal fissure is dilated on each side into a conspicuous supramaxillary plate; there are at least two supraorbital setæ; the mandibles have no seta in the scrobe, which is usually rudimentary; the mentum is fused with the submentum and the tooth in the emargination is bicuspid; the prothorax is strongly contracted behind, without hind angles, the base more or less produced; the elytra are unbordered at base. The procoxal cavities are closed behind, the metacoxæ separated, the protibiæ emarginate on the inner side, with the variable spur placed at some little distance from apex, the protarsi similar in the two sexes.

This is the only group represented in India in which a stridulating apparatus has yet been detected.

Chaudoir, following Lacordaire, included three genera in his Monograph of the 'Siagonides,' viz., *Enceladus* from South America, *Luperca* (under the name of *Holoscelis*), and *Siagona*. G. H. Horn removed the first of these to form his tribe ENCELADINI, but he did not know the genus *Luperca* and was not therefore able to decide whether to place it in this group or among the Siagonini. In his 'Classification of the Family Carabidæ,' Mr. T. G. Sloane separates the two groups by the

character of the emargination of the protibiæ and the consequent position of the variable spur. In *Enceladus* the protibiæ have only a short apical groove, so that both spurs are quite close to the apex. In *Siagona* the protibiæ are inwardly emarginate, the excision extending half way from apex towards base. In *Luperca* the excision does not extend quite so far, but in character it resembles that of *Siagona*, not that of *Enceladus*, and in other respects the genus is evidently a near ally of *Siagona*.

Key to the Genera.

1 (2) Antennæ with joints 1 to 4 pilose, head also pilose, so that the supraorbital pores are masked, mentum and submentum fused, prothorax with a longitudinal groove on each side . . . . . SIAGONA, p. 174.

2 (1) Antennæ with joints 1 to 4 glabrous, except at apex, head also glabrous, with two supraorbital setæ on each side, mentum and submentum separated by a transverse ridge, prothorax without longitudinal grooves LUPERCA, p. 205.

Genus **SIAGONA**.

Siagona, Latreille, Nouv. Dict. Hist. Nat. xxiv, 1804, Tab. Méth. p. 141; id., Gen. Crust. et Ins. i, 1806, p. 208; Dejean, Spec. Gen. i. 1825, p. 357; Chaudoir, Bull. Mosc. 1850, i, p. 439; Lacordaire, Gen. Col. i, 1854, p. 162; Chaudoir, Mon. des Siagonides, Bull. Mosc. 1876, i, p. 76; Péringuey, Trans. S. Afr. Philos. Soc. vii, 1896, p. 414; Bedel et François, Bull. Soc. Ent. Fr. 1897, p. 38; Bedel, Cat. rais. Col. N. Afr. 1897, p. 106, note (2); W. Horn, Deutsch. Ent. Zeitschr. 1907, p. 428; Andrewes, in Mission Babault Ind. Carab. 1924, p. 13; Bänninger, Ent. Blätt. 1928, p. 55.

TYPE, *Cucujus rufipes*, F (North Africa.)

Form elongate, nearly always flat, body either winged or apterous, surface generally shiny, with a characteristic microsculpture formed by a reticulation of isodiametric meshes, each one faintly impressed, so as sometimes to give the impression of minute puncturation, usually distinct on the elytra, mandibles, and labrum, but finer and often indistinct or wanting on the rest of the head and the prothorax.

Colour usually piceous or black, sometimes varied with red, brown, or ferruginous, the surface clothed more or less with a short flavous or light grey pubescence, largely masking the longer tactile setæ, which are usually present on different parts of the body.

Head wide, quadrate, moderately convex, with a ridge on each side close to eye ("lateral ridges"), curved or bent inwards in front of eye, and usually continued vaguely forward

along side margins of clypeus, rounded or angulate at the bend, and sometimes more or less interrupted at that point, generally parallel behind, continued at least to mid-eye level and often to the neck-constriction; neck usually smooth and convex, more or less constricted at a little distance behind eyes; eyes relatively small, very convex, and often hemispherical (Indian species), widely separated from buccal fissure, the supraorbital setæ masked by the general pubescence; sides of head beneath the eyes and base of antennæ laterally dilated, and forming a flattened horizontal plate on each side ("supramaxillary plates"), the sides of which are usually parallel, though sometimes dilated in front, the external angle often rounded; labrum truncate in front, or more often emarginate in middle and with a rounded tooth in the emargination, front margin 5-setose, sides finely ciliate; clypeus transverse, emarginate in front, often depressed along median line, finely punctate and sometimes subrugose at sides, a long seta on each side at base; mandibles short, but thick, curved and sharply pointed, without scrobe, but with a rounded external carina at base, a sharp, sometimes bicuspid inner tooth in front, and one or two vague smaller teeth towards base, the upper surface of the teeth usually transversely striate, ♂ with the base sometimes widely externally dilated, and the upper surface with a short, rounded, longitudinal carina, occasionally a good deal raised above the general level; ligula quadrate, carinate beneath, truncate and sexsetose at apex, a slight emargination at middle, paraglossæ wanting or fused with sides of ligula; mentum wide, completely fused with the submentum, deeply emarginate, a stout bicuspid tooth, much shorter than the lobes, in the emargination, sides and apex of lobes strongly rounded, epilobes well developed, vertical, surface subrugose-punctate; maxillæ wide at base, densely setose within, strongly hooked, sharp, and glabrous at apex, outer lobe with two joints; palpi stout, ciliate, maxillaries with joints 3 and 4 equal, each a little shorter than 2, 4 slightly dilated and truncate at apex, labials with 2 and 3 about equal, 3 triangular, obliquely truncate and very wide at apex, which is excavated; antennæ stout, usually reaching middle of elytra, joints 1 to 3 (sometimes 4) moderately, the remaining joints more densely pilose, joint 1 strongly clavate, as long as the next three taken together, slender at base, which lies in the groove between eye and buccal fissure, and increasing in thickness, usually gradually, towards apex.

Prothorax cyathiform, rather flat on disk, convex at sides, base narrow, produced, and slightly emarginate, apex wide and generally broadly emarginate, front angles rounded and rather inconspicuous, hind angles wanting, sides narrowly bordered, rounded close to front angles, then straight or

moderately rounded, after which they are very strongly and often sharply contracted to a point a little in front of base; median line generally extremely fine, a deep longitudinal groove on each side ("lateral grooves") midway between median line and margin, frequently subinterrupted a little in front of middle, and turning sharply outwards near apex.

Elytra pedunculate, more or less oval, usually very flat, without striæ, very little wider than prothorax, and nearly always less than twice as long as wide, the surface more or less densely punctate and pubescent, the suture generally narrowly smooth, a short oblique ridge ("humeral ridge") sometimes visible, running outwards and backwards across shoulder, a row of some half dozen setiferous pores along its course, and a few along sides, approximately on the site of interval 7, and near apex, occasionally one or two on disk, the pores of the marginal series not at all closely placed.

Sternum: prosternum more or less punctate, the process flattened, unbordered, metasternum and all the episterna usually very finely punctate, metepisterna long and extremely narrow behind. *Venter* very finely punctate, the last three segments transversely sulcate. *Legs* not specially adapted for digging, metacoxæ separated fairly widely, femora moderately dilated, protibiæ inwardly excised, the variable spur at some distance from apex, mesotibiæ clothed outwardly on apical half with a thick rufous brush, tarsi pubescent, protarsi similar in the two sexes, claws smooth.

♂. In this genus there is considerable variation in the shape of the ædeagus, as shown in the diagram on p. 182, but as the drawings show its form more clearly than words could do, no attempt at a description has been made under the different species.

Stridulatory apparatus. This consists of two parts: (i.) a ridge, with a series of minute transverse notches, on the underside of the prothorax, running along the propleura, parallel with and near their inner margin; (ii.) a small area with a surface like a file on the lower side of the front face of the profemora, at about two-fifths from apex, the ridges of the file more or less parallel to the length of the femora. These two surfaces are no doubt rubbed together to produce the required sound, but under what circumstances there is no evidence to show, nor, so far as I am aware, has any observer heard or seen the apparatus in action.

Range. India, Ceylon, Burma, Malay States, Laos, Cambodia, Cochin China, Java (an undescribed species in the British Museum, represented by a single example from the Bowring collection), Baluchistan, Irak, Arabia, Syria, Transcaspia, Southern Europe, and Africa.

These insects are said to live under stones, in sand, in open

country, etc. The very flat form suggests a confined space, such as that between the trunk and the loose bark of a tree, and I have a note that specimens of *S. fabricii* have been found both " under tree bark " and " between Palmyra leaf-sheaths." Other examples have been taken " in a rotten log," and " under trap-boulders, stones, and flower-pots," while many of the Indian species are attracted to light in the evening. I have personally taken a large number of specimens of four different species, nearly all of them in the vegetable refuse surrounding the rice-fields during the rainy season, and in the crannies at the foot of a large *Eugenia jambolana* adjoining them. The solitary example of *S. europea* brought back by the Seistan Expedition was found in rather similar circumstances " under drift at edge of Hamun " (*i. e.*, the Seistan lake). Nothing appears to be recorded of the early states, not only of the Indian species, but even of the comparatively common *S. europea.*

In this genus some species are winged and others apterous, and Chaudoir in his Monograph made use of this character for his primary division of the species. He says that some authors, among whom he mentions Erichson and Lacordaire, believed that both winged and apterous forms could sometimes occur in the same species, but he did not concur with this view. I believe that Erichson and Lacordaire were right, and that Chaudoir's *punctatissima* is an apterous form of *depressa* * This supposition is rendered more probable by the fact that among the Indian species I have found winged and wingless forms in two other species, namely, *pubescens* and *dilutipes*; in the former case among individuals from widely different parts of India, in the latter among examples taken at the same time and place. Nevertheless I have not found any better character for a primary division.

Chaudoir relied also, in his subdivision of the species, on the character of the punctures on the elytra, whether round or elongate ; there is, no doubt, considerable variation of form, but both kinds may be present at the same time, and, in addition, so much depends on the angle at which the specimen is viewed, that I have not been able to make use of the form of the puncturation to separate the species. In the subjoined Key the three species mentioned above have been included twice over, as has the very rare *S. induta*, which presents several doubtful features.

* While this work was passing through the press, I have seen several apterous examples.

Key to the Species.

1 (42) Body winged.

2 (27) Lateral ridges on head reaching, or very nearly reaching neck constriction, a stridulating apparatus frequently present. Large species, rarely under 12 mm. in length.

3 (14) Lateral ridges on head uninterrupted at the bend (rarely subinterrupted, and then forming a very sharp angle).

4 (13) Elytra at least moderately punctate.

5 (12) Neck constriction shallow to moderately deep, joint 1 of antennæ gradually dilated from base to apex, length at least 14 mm.

6 (9) Elytra densely punctate, sides of prothorax strongly rounded, a stridulating apparatus present.

7 (8) Prothorax about a fourth wider than long, elytra widest behind middle, average length 18 mm. ... .. *punctulata*, Chaud., [p. 181.

8 (7) Prothorax nearly a half wider than long, elytra regularly oval, average length 22 mm. . .. , *cyathodera*, Andr., [p. 183.

9 (6) Elytra not densely punctate, sides of prothorax not strongly rounded.

10 (11) Mandibles more or less laterally striate, prothorax with the lateral grooves deep and uninterrupted, upper surface finely punctate, a stridulating apparatus present .. .. . *angulifrons*, Bates, [p. 184.

11 (10) Mandibles longitudinally striate at base, prothorax with the lateral grooves interrupted at middle, upper surface coarsely punctate, no stridulating apparatus present .. .. *plicata*, sp. nov., [p. 185.

12 (5) Neck constriction very deep, joint 1 of antennæ rather suddenly dilated at about middle, length not exceeding 13 mm., no stridulating apparatus present . ... *fabricii*, Andr., p. 185.

13 (4) Elytra practically impunctate, a stridulating apparatus present or absent. *polita*, Andr., p. 192.

14 (3) Lateral ridges on head interrupted at the bend.

15 (24) Elytra fairly closely and conspicuously punctate.

16 (23) Prothorax only slightly contracted in front. its sides straight or gently rounded, not evidently emarginate when viewed sideways, elytra not more than three-fourths longer than wide.

17 (20) No stridulating apparatus present, legs black.

18 (19) Puncturation of upper surface rather coarse and not very close, eyes not projecting laterally beyond level of supramaxillary plates, average length 19·5 mm. .. .. *pubescens*, Chaud., [p. 186

19 (18) Puncturation of upper surface not coarse, but rather close, eyes projecting laterally beyond level of supramaxillary plates, average length 16 mm. ... . . *depressa*, F., p. 187

20 (17) A stridulating apparatus present at least in ♂, legs flavous or ferruginous.

21 (22) Head with lateral ridges obtusely angulate, supramaxillary plates strongly dilated in front, disk of prothorax nearly smooth, length 20 mm. *dilutipes*, Chaud., var. *aligera*, var. nov., p. 203.

22 (21) Head with lateral ridges sharply angulate, supramaxillary plates at most slightly dilated in front, disk of prothorax evidently and coarsely punctate, average length 15 mm. . *baconi*, Chaud., p. 189.

23 (16) Prothorax rather strongly contracted in front, its sides conspicuously rounded, and appearing emarginate when viewed sideways, the elytra practically twice as long as wide, a stridulating apparatus present, average length 22·5 mm. *induta*, Chaud., p. 190.

24 (15) Elytra sparsely or finely punctate.

25 (26) Prothorax with the lateral grooves more or less interrupted on disk, elytra sparsely and irregularly punctate, the punctures of different sizes, a stridulating apparatus present in ♂ only (or wanting), average length 19 mm. *atrata*, Dej., p. 191.

26 (25) Prothorax with the lateral grooves scarcely interrupted on disk, elytra very finely and uniformly punctate, a stridulating apparatus developed in both sexes, average length 16 mm. *obscuripes*, Chaud., [p. 193.

27 (2) Lateral ridges on head produced backwards to mid-eye level only, or more rarely terminating in a setiferous pore at about hind-eye level, uninterrupted or at most vaguely interrupted in front, neck constriction always deep, no stridulating apparatus present. Small species, rarely over 12 mm. in length.

28 (41) Body flat, prothorax with the lateral grooves evidently interrupted on disk.

29 (32) Upper surface uniformly black or piceous.

30 (31) Upper surface not very closely punctate, disk of prothorax moderately smooth at sides, antennæ and legs piceous, average length 11 mm.. *europea*, Dej., p. 194.

31 (30) Upper surface closely punctate, antennæ and legs dark red, average length 8 mm.. . . . . *kulla*, Andr., p. 202.

32 (29) Upper surface black or piceous, but variegated with red or ferruginous.

33 (38) Elytra very finely and closely punctate, prothorax concolorous, disk of elytra black or piceous.

34 (37) Upper surface piceous, elytra three-fourths longer than wide, dark red or brown at apex.

35 (36) Apex of elytra dull red, average length 12 mm. .. . . *apicalis*, Andr., p. 195.

36 (35) Apex of elytra light brown, length 9 mm.. .. . ... *cinctella*, Chaud., p. 197.

37 (34) Upper surface pale brown, with a broad piceous patch running down the middle, elytra four-fifths longer than wide, average length 9 mm. *flesus*, F., p. 196.

38 (33) Elytra not very finely or closely punctate.

39 (40) Prothorax only slightly contracted in front, concolorous, disk of elytra red-brown, average length 11 mm. .. *plana*, F., p. 198.

40 (39) Prothorax evidently contracted in front, piceous, with the whole of disk dark red, disk of elytra piceous, length 12 mm. . . . *rubescens*, sp. nov., [p. 199.

41 (28) Body subconvex, prothorax with the lateral grooves not interrupted on disk, its sides rounded and evidently contracted in front, average length 10·5 mm.. *pumila*, Andr, p. 199.

42 (1) Body apterous.

43 (46) Lateral ridges on head uninterrupted at the bend.

44 (45) Body subconvex, colour piceous, prothorax with the lateral grooves uninterrupted, length 11 mm... *angustipennis*, Bates, [p. 200.

45 (44) Body flat, colour dark red, prothorax with the lateral grooves interrupted on disk, length 8·5 mm. . *pygmæa*, Andr., p. 201.

46 (43) Lateral ridges on head interrupted at the bend.

47 (54) Prothorax only slightly contracted in front, with its sides straight or gently rounded, not evidently emarginate when viewed sideways, elytra not more than three-fourths longer than wide.

48 (51) No stridulating apparatus present, legs black.

49 (50)	Puncturation of upper surface rather coarse and not very close, eyes not projecting laterally beyond level of supramaxillary plates, average length 19 mm. . ..	*pubescens*, Chaud., var. *degener*, var. nov., p. 187.
50 (49)	Puncturation of upper surface not coarse, but rather close, eyes projecting laterally beyond level of supramaxillary plates, average length 15 mm.	*depressa*, F., var. *punctatissima*, Chaud., p. 189.
51 (48)	A stridulating apparatus present at least in ♂, legs flavous or ferruginous.	
52 (53)	Head with the lateral ridges obtusely angulate at the bend, disk of elytra fairly closely punctate, ♂ with left mandible outwardly smooth, a carina on its upper surface at base, average length 17 mm.	*dilutipes*, Chaud., [p. 202.
53 (52)	Head with the lateral ridges sharply angulate at the bend, disk of elytra sparsely punctate, ♂ with left mandible outwardly transversely striate, without carina on its upper surface at base, average length 18 mm.	*rustica*, sp. nov., p. 204.
54 (47)	Prothorax rather strongly contracted in front, its sides conspicuously rounded, appearing emarginate when viewed sideways, the elytra practically twice as long as wide, a stridulating apparatus present, average length 22·5 mm. .	*induta*, Chaud., p. 190.

67. Siagona punctulata, *Chaud.* [Fig. 32 (1).]

Siagona punctulata, Chaudoir *, Mon. p. 99 ; Bänninger, Ent. Blätt. 1928. p. 56.

Body winged, very closely pubescent.

Colour black, palpi piceous.

Head rather small, clypeal suture fairly deep, lateral ridges only moderately thick, even in front, rounded at the bend and with only a suggestion of interruption, parallel behind and very nearly reaching neck constriction, which is deep ; surface rather coarsely and closely punctate, scarcely less so on disk, neck smooth, with only one or two minute punctures at sides ; mandibles practically similar in the two sexes ; supramaxillary plates with parallel sides, rather sharply rounded in front ; antennæ not reaching middle of elytra, joint 1 moderately clavate. *Prothorax* a fifth wider than head and a fourth wider than long, sides strongly rounded from the front angles and sinuate behind a little further than usual from the base ; median line very distinct, lateral grooves deep at extremities,



Fig. 32.—Male genitalia of Indian species of *Siagona* (dorsal and lateral aspects).

1. *S. punctulata*, Chaud.
2. *S. cyathodera*, Andr.
3. *S. angulifrons*, Bates.
4. *S. fabricii*, Andr.
5. *S. polita*, Andr.
6. *S. pubescens*, Chaud.
7. *S. depressa*, Dej.
8. *S. dilutipes*, Chaud.
9. *S. baconi*, Chaud.
10. *S. atrata*, Dej.
11. *S. obscuripes*, Chaud.
12. *S. europea*, Dej.
13. *S. flesus*, F.
14. *S. pumila*, Andr.
15. *S. rustica*, Andr.

(Nos. 1, 5, 6, 10 are seen from the right, the remainder from the left.)

only slightly shallower at middle, surface finely, closely, and nearly uniformly punctate, a small, slightly smoother area on each side between median line and lateral grooves. *Elytra* subovate, with conspicuous shoulders, a fourth wider than prothorax and three-fourths longer than wide, surface finely and very closely asperate-punctate, the punctures round and sometimes laterally confluent, extending almost to suture, humeral ridge evident, with a row of six or seven pores extending obliquely across shoulder. Microsculpture of elytra very distinct, that on head and prothorax also distinct, though much finer. *Stridulating apparatus* present, but the ridges on the propleura are very fine.

Length, 17–19 mm.

BENGAL: Dacca; Berhampur; Sahibganj (*J. Wood Mason*). BIHAR: Pusa.

Type in Mr. René Oberthür's collection.

68. **Siagona cyathodera**, *Andr.* [Fig. 32 (2) & Plate V, fig. 5.]

Siagona cyathodera, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 409; Bänninger, Ent. Blätt. 1928, p. 56.

Siagona punctulata, Bates (not Chaud.), Ann. Mus. Civ. Gen. xxxii, 1892, p. 285.

Body winged, with a short greyish pubescence.

Colour black.

Head with the clypeal suture moderately deep, lateral grooves thick in front, uninterrupted, rounded at the bend, finer behind, parallel, subpunctate, reaching neck constriction, which is moderately deep; surface fairly closely and rather coarsely punctate, a little more sparsely on middle of front, neck with only one or two punctures just behind the constriction; mandibles moderately stout, inwardly striate, apparently similar in the sexes; supramaxillary plates fairly conspicuous, with parallel sides, sharply rounded in front; antennæ reaching middle of elytra, joint 1 strongly clavate, but not suddenly dilated. *Prothorax* very convex at sides, a fourth wider than head, and very nearly a half wider than long, sides strongly rounded and sharply contracted both in front and behind; median line very clear, lateral grooves deep, subinterrupted; surface finely and rather closely punctate, a little more sparsely on each side of disk, very closely along front and hind margins. *Elytra* elongate-oval, but with evident shoulders, about a sixth wider than prothorax and four-fifths longer than wide, surface closely and finely asperate-punctate, not quite so closely on disk, the punctures cuneiform, and extending right up to the suture, humeral ridge long, irregular, and conspicuous, with at least half a dozen punctures. Microsculpture of the

elytra distinct, and in the form of a minute puncturation, indistinct on head and prothorax. *Stridulating apparatus* well marked.

Length, 22 mm.

BURMA: Bhamo (*L. Fea*).

Type in my collection.

69. **Siagona angulifrons**, *Bates*. [Fig. 32 (3).]

Siagona angulifrons, Bates*, Ann. Mus. Civ. Gen. xxxii, 1892, p. 284; Bänninger, Ent. Blätt. 1928, p. 56, t. f. 13.

Body winged.

Colour black to piceous, legs ferruginous to dark red.

Head wide, clypeus longitudinally depressed along median line, the depression sometimes extending to front, clypeal suture fairly deep, lateral ridges not very thick, uninterrupted, strongly angulate at the bend, parallel behind and very nearly reaching the rather shallow neck constriction; surface very sparsely punctate, even at sides and behind, front practically smooth, as is the neck; mandibles stout, inwardly striate, outwardly more or less transversely rugose-striate, ♂ somewhat dilated laterally, right mandible with a rounded carina on upper surface at base, left mandible only vaguely carinate; supramaxillary plates slightly dilated in front, angulate in ♂, somewhat rounded in ♀; antennæ reaching middle of elytra, joint 1 very slender at base. *Prothorax* not much wider than head, a third wider than long, sides nearly parallel, but rounded close to front angles, sharply contracted behind; median line fine, lateral grooves deep throughout, surface very finely punctate along margins, narrowly at sides, almost smooth over the whole of the disk, but sometimes with some punctures along each side of median line. *Elytra* oval, with shoulders visible, though only slightly developed, only a little wider than prothorax, but nearly three-fourths longer than wide, surface rather finely and not very closely punctate, a little more closely at sides and more sparsely on disk, punctures variable in shape, suture fairly widely impunctate, humeral ridge just visible, a slight depression at each side on shoulder and a somewhat larger one rather behind it. Microsculpture very clear on the elytra, much finer and a little less visible on head and prothorax. *Stridulating apparatus* well developed.

Length, 14–18 mm.

BURMA: Mandalay and Palon (*L. Fea*); Pyinmana (*Miss Molesworth*); Tharrawaddy (*G. Q. Corbett*); Rangoon (*E. A. d'Abreu* and *L. Fea*); Tenasserim (*J. W Helfer*).

Type in the Genoa Civic Museum.

70. Siagona plicata, sp. nov.

Body winged.

Colour piceous black.

Head wide, clypeus longitudinally depressed along median line, clypeal suture moderately deep, lateral ridges thick in front, obtusely angulate, uninterrupted, laterally compressed and with one or two punctures at the bend, finer behind, a little divergent, not quite reaching neck constriction, which is moderately deep; surface rather coarsely but not closely punctate, front nearly smooth, one or two punctures at sides of neck; mandibles at base inwardly striate, outwardly longitudinally plicate; supramaxillary plates with parallel sides, sharply rounded at apex; antennæ incomplete, joint 1 not suddenly dilated. *Prothorax* about a fourth wider than head, and as much wider than long, sides slightly contracted and gently rounded in front, strongly contracted behind; median line extremely fine, lateral grooves deep at extremities, but only very faintly impressed on disk; surface rather coarsely and sparsely punctate, more finely and closely along margins. *Elytra* subovate, with well-marked shoulders, slightly wider than prothorax and about four-fifths longer than wide, coarsely and not very closely, though uniformly punctate, the punctures round, a fairly wide impunctate margin to the suture, a slight depression at each side on the shoulders, humeral ridge absent, the pores at base and along sides almost concealed by, though slightly larger than, those of the general puncturation. Microsculpture distinct on elytra, wanting on head and prothorax. *Stridulating apparatus* wanting.

Length, 18–19 mm.

"INDIA."

Type in the British Museum; cotype in the Oxford University Museum.

The label on the type, which came from the Bowring collection, bears only the word "India," and the Oxford example has no label at all. The peculiar form of the mandibles is a distinguishing feature of this species.

71. Siagona fabricii, *Andr.* [Fig. 32 (4).]

Siagona fabricii, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 158; id., in Mission Babault Ind. Carab. 1924, p. 14; Bänninger, Ent. Blätt. 1928, p. 56.

Siagona europea, Chaudoir (not Dej.), Mon. p. 91 (part).

Siagona depressa, Bedel (not F.), Ann. Soc. Ent. Fr. 1887, p. 195 (part); Bates, Compt. rend. Soc. Ent. Belg. 1891, p. 326; Bedel, Cat. rais. Col. N. Afr. 1897, p. 108 (part); Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470.

Body winged.

Colour piceous to black, palpi more or less brown.

Head rather small, moderately convex, clypeus emarginate, clypeal suture moderately deep, lateral ridges rather fine, uninterrupted, rounded at the bend, and diverging a little behind, nearly but not quite reaching the deep neck constriction; surface moderately punctate, sparsely on middle of front, more closely at sides and behind, including the front of neck bordering the constriction; mandibles rather small, slightly dilated at base, similar in the two sexes; supramaxillary plates only moderately conspicuous, with parallel sides, rounded in front; eyes small, hemispherical; antennæ very nearly reaching middle of elytra, joint 1 very slender at base, suddenly dilated at middle and strongly clavate at apex. *Prothorax* rather flat on disk, convex at sides, about a third wider than head and as much wider than long, sides rather strongly rounded, moderately contracted in front; median line extremely fine, lateral grooves deep, subinterrupted on disk; puncturation fairly close and rather coarse, conspicuous along sides of median line, a little less close at sides of disk. *Elytra* flat, nearly oval, but widest a little behind middle, base angulate at sides, shoulders oblique but quite evident, surface closely and uniformly punctate, though the punctures, which are nearly round, decrease a little in size from base to apex, the smooth area adjoining suture very narrow, humeral ridge obsolete, the pores at base and along sides just distinguishable from the general puncturation. Microsculpture evident and somewhat imbricate in appearance. *Stridulating apparatus* wanting.

Length, 11–13 mm.

BENGAL. BIHAR. ORISSA. INDORE. CENTRAL PROVINCES. KATHIAWAR. BOMBAY. MADRAS. MYSORE. CEYLON.

Type in my collection.

The species is found abundantly throughout Central and Southern India, but appears to be less common in the North-East and in Ceylon. I have seen no specimens from places in the North-West, though there are examples labelled "N.W. India" in the British Museum. The localities mentioned in my notes are so numerous that I have thought it sufficient to enumerate the provinces in which examples have been taken.

A note of mine made in 1886, at Belgaum, runs: "Taken commonly during rains in the vegetable refuse along the borders of the ricefields." A characteristic feature is the sudden way in which the first antennal joint is dilated.

72. **Siagona pubescens**, *Chaud.* [Fig. 32 (6).]

Siagona pubescens, Chaudoir *, Bull. Mosc. 1850, i, p. 439; id., Mo p. 95; Bänninger, Ent. Blätt. 1928, p. 56.

Body winged, shortly and fairly closely pubescent.

Colour black, palpi piceous.

Head wide, clypeus longitudinally depressed along median line, the depression often extending to front, clypeal suture very fine, lateral ridges thick in front, angulate and interrupted at the bend, fine and hardly diverging behind, reaching neck constriction, which (for the genus) is shallow; surface moderately punctate, though a rather large area on middle of front is practically smooth, and the neck is quite smooth; mandibles stout, inwardly striate, ♂ outwardly dilated at base and with a rounded carina on upper surface; supramaxillary plates a little dilated in front and externally angulate; antennæ not quite reaching middle of elytra, joint 1 strongly clavate. *Prothorax* a fifth wider than head and a fourth wider than long, sides rounded, but very little contracted in front; median line almost invisible, lateral grooves moderately deep at extremities, subinterrupted on disk; surface closely and finely punctate along margins, with few and coarser punctures on disk. *Elytra* subovate, shoulders moderately conspicuous, just wider than prothorax and two-thirds longer than wide, surface closely and rather coarsely punctate, the punctures round (seen from above) suture slightly raised and impunctate, humeral ridge evident. Microsculpture clear on elytra, less evident on head and prothorax. *Stridulating apparatus* wanting.

Length, 18–21 mm.

NEPAL. BENGAL: Bankipur. "N.W INDIA." (Brit. Mus.).

Type in Mr. René Oberthür's collection.

72 *a*. Siagona pubescens, *Chaud.*, var. **degener**, var. nov.

Specimens from Central and Southern India, though a little smaller, agree well with the North Indian form, except that the wings are rudimentary and the shoulders more rounded, so that the elytra have a more oval appearance.

Length, 18–20 mm.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*). BOMBAY: Belgaum (*H. E. Andrewes*—type); Kanara (*T. R. D. Bell*); Dharwar (*H. Swale*).

Type in my collection.

My specimens were taken during the rains along with those of *fabricii*.

73. Siagona depressa, *F.* [Fig. 32 (7).]

Carabus depressus, Fabricius *, Suppl. Ent. Syst. 1798, p. 56.
Galerita depressa, Fabricius, Syst. Eleuth. i, 1801, p. 215; Hope, Col. Man. ii, 1838, p. 99.
Scarites tomentosus, Herbst *, Nat. Syst. Ins. Käf. x, 1806, p. 260, t. 175. f. 12; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 98.

Siagona depressa, Motchulsky, Etudes Ent. 1855, p. 42; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 157; Bänninger, Ent. Blätt. 1928, p. 56, t. f. 12.
Siagona germana, Chaudoir *, Mon. p. 96.

Body winged, closely covered with pale pubescence.

Colour black, palpi and tarsi piceous.

Head wide, moderately convex, clypeus emarginate in front, depressed along median line, clypeal suture lightly impressed, lateral ridges rather fine, angulate at the bend and subinterrupted, hardly diverging behind and not quite reaching neck constriction, which (for the genus) is unusually shallow; surface moderately punctate, with punctures of unequal size, more sparsely on disk, neck entirely smooth; mandibles fairly stout, ♂ laterally dilated and with a short carina on

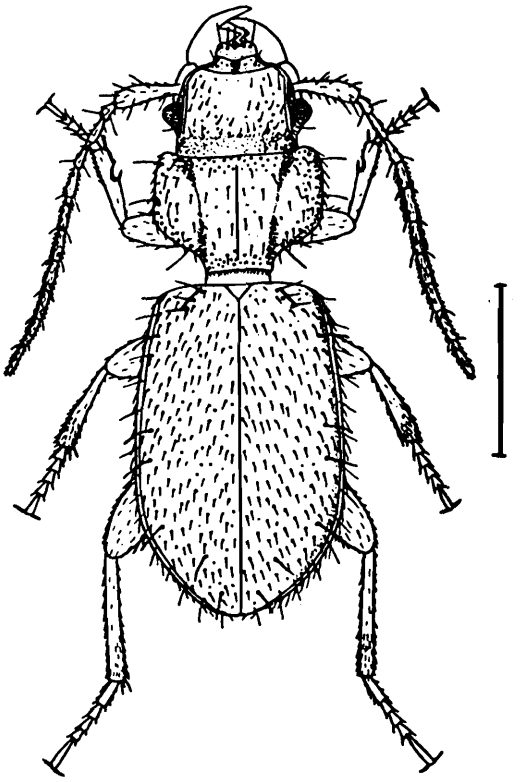


Fig. 33.—*Siagona depressa*, F.

upper surface at base; supramaxillary plates conspicuous, slightly dilated and sharply rounded in front, antennæ stout, not quite reaching middle of elytra, joint 1 subclavate but not suddenly dilated. *Prothorax* a little wider than head and about a fourth wider than long, apex widely emarginate, sides rounded but not very much contracted in front; median line almost invisible, lateral grooves moderately deep at extremities, subinterrupted on disk; surface rather sparsely punctate on disk, more closely along margin and along each side of median line, the punctures no larger than those on head. *Elytra* oval

but with evident shoulders, very little wider than prothorax, three-fourths longer than wide, surface rather closely and nearly uniformly punctate, the punctures oval, and, viewed sideways, more or less confluent, suture slightly raised and impunctate, humeral ridge clearly visible. Microsculpture evident on elytra, but very faint on head and prothorax. *Stridulating apparatus* obsolete, though traces of a raised line are sometimes visible on the propleura.

Length, 14·5–17·5 mm.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*). MADRAS: Pondicherry (*Perrotet*); Trichinopoly (*C. Leigh* and *Newton*); Madura; Tranquebar. CEYLON: Vavuniya (*G. M. Henry*).

Type in the Kiel University Museum; that of *tomentosa* in the Berlin Zoological Museum; that of *germana* in Mr. René Oberthür's collection.

The species seems to be almost confined to the Madras Presidency, the records from the Central Provinces and Ceylon referring to single specimens only.

73 *a*. **Siagona depressa**, *F.*, var. **punctatissima**, *Chaud.*

Siagona punctatissima, Chaudoir *, Mon. p. 106; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 158.

According to the brief notes I made at Rennes some years ago, *punctatissima* and *germana* proved to be identical in appearance, but Chaudoir puts the former among the apterous species. The variety seems therefore to differ from the type form in the absence of wings only, but a further examination in confirmation of this view is certainly desirable *.

74. **Siagona baconi**, *Chaud.* [Fig 32 (9).]

Siagona baconi, Chaudoir *, Mon. p. 89; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 285; Bänninger, Ent. Blätt. 1928, p. 56.

Body winged, shiny, and covered with a conspicuous flavous pubescence.

Colour piceous to black, legs ferruginous.

Head wide, moderately convex, clypeal suture fairly deep, lateral ridges thick in front, rather fine behind, reaching the deep neck constriction, angulate and interrupted at the bend, the two parts overlapping a little; surface rather closely and coarsely punctate, the punctures of unequal size, middle of front smooth; mandibles in ♂ with the base strongly rounded and deeply bordered externally, the inner margin of each raised at base in the form of a short rounded carina, almost resembling a horn; supramaxillary plates conspicuous, the sides parallel

* While this work was in the press, I saw several apterous examples from Trichinopoly, which in other respects resembled the type form of *depressa*.

or only very slightly dilated and rounded in front; antennæ not quite reaching middle of elytra, evidently tapering towards apex, joint 1 strongly clavate. *Prothorax* a little wider than head and about a third wider than long, base slightly, apex widely emarginate, sides only a little contracted in front, rounded and strongly contracted behind; median line excessively fine, lateral grooves deep, uninterrupted, and only slightly shallower in front; puncturation rather coarse and fairly close, finer and closer along base, rather less close on each side of disk. *Elytra* subovate, a fifth wider than prothorax and two-thirds longer than wide, very slightly dilated behind, shoulders fairly square, with an irregular depression on each side behind them, surface rather closely and coarsely punctate, the punctures mostly cuneiform, becoming gradually finer from base to apex, suture impunctate, humeral ridge inconspicuous, though the setiferous pores on basal area are quite visible. Microsculpture quite evident and somewhat imbricate in appearance. *Stridulating apparatus* well developed in both sexes.

Length, 12·5–16 mm.

SIKKIM: Darjiling. BENGAL: Malda; Berhampur; Sahibganj (*J Wood Mason*); Narail. BIHAR: Pusa (*H. M. Lefroy* and *G. P. Pillai*); Chapra (*Mackenzie*); Purnea district, Kierpur and Katihar (*C. Paiva*). INDORE: Mhow. BURMA.

Type in Mr. René Oberthür's collection.

Chaudoir mentions specimens from Burma, now in the Genoa Civic Museum (coll. Castelnau), but I have seen only Indian specimens, ranging from 14 to 16 mm. in length.

75. Siagona induta, *Chaud.*

Siagona induta, Chaudoir *, Mon. p. 98; Bänninger, Ent. Blätt. 1928, p. 56.

Body possibly winged, possibly apterous, shortly and closely pubescent.

Colour black, palpi piceous.

Head wide, rather massive in the ♂, clypeus with its front margin depressed, clypeal suture fairly deep, lateral ridges thick in front, rounded and slightly interrupted at the bend, finer behind, parallel, not quite reaching the neck constriction, which is only moderately deep; surface closely and coarsely punctate, middle of front smooth and with a slight depression, neck smooth; mandibles large and stout, ♂ strongly dilated at base and with an elevated, rounded, and highly polished boss on the upper surface of each at base, that on the left mandible higher than that on the right; supramaxillary plates a little dilated and rounded in front; antennæ with joint 1

strongly clavate. *Prothorax* very little wider than head, but fully a third wider than long, apex widely emarginate, sides rather strongly contracted in front, appearing from above nearly straight, though, viewed sideways, evidently emarginate between widest point and front angle, contracted very sharply behind ; median line distinct, lateral grooves deep throughout ; surface closely and finely punctate, the punctures much smaller than those of head, a slight, nearly smooth space on each side of disk between median line and lateral grooves. *Elytra* elongate-oval, but with well marked shoulders, slightly wider than prothorax and very nearly twice as long as wide, surface densely and rather finely asperate-punctate, more closely and somewhat confluently in the ♂, the punctures evidently oval, the oblique humeral ridge formed by several subtuberculate pores, one or two of which are also visible in a depression on each side behind shoulder. Microsculpture very distinct on elytra, also distinct, though much finer, on head, less distinct on prothorax. *Stridulating apparatus* well developed.

Length, 22–23 mm.

ASSAM : Sibsagar (*S. E. Peal*). BENGAL : Dacca. TIBET : Daflas, Dunsiri Valley.

Type in Mr. René Oberthür's collection.

Some doubts remain to be cleared up about this species. I saw the type some years ago, and have seen only two other broken examples. Chaudoir places the species among those which are winged, but I have not been able to detect any wings. Again one of the specimens before me is clearly a ♂, with mandibles more highly developed than in any other Indian species I have seen, but the type was said also to be a ♂, and in this the mandibles apparently resemble those of the ♀. Possibly Chaudoir was mistaken regarding the sex, or there may be two species in question ; in any case fresh material is required to clear up these uncertainties.

76. Siagona atrata, *Dej.* [Fig. 32 (10).]

Siagona atrata, Dejean *, Spec. Gen. i, 1825, p. 360 ; Chaudoir, Mon. p. 85 ; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 181 ; Bänninger, Ent. Blätt. 1928, 56, t. f. 3.

Body winged, very shiny, and covered with a scanty flavous pubescence.

Colour black, palpi piceous.

Head wide, moderately convex, clypeal suture fairly deep, lateral ridges rather thick, rounded and subinterrupted at the bend, reaching neck constriction, which is deep ; surface lightly punctate, chiefly behind, middle of front and neck smooth ; mandibles very stout, ♂ laterally dilated, and with

a short carina on upper surface at base ; supramaxillary plates conspicuous, dilated in front, the angle rounded ; antennæ reaching basal third of elytra, joint 1 strongly clavate. *Prothorax* a sixth wider than head and a third wider than long, base slightly emarginate, apex widely and rather deeply emarginate, sides strongly rounded in front and sharply contracted behind ; median line extremely fine, lying in a shallow depression, lateral grooves deep at base, subinterrupted on disk ; puncturation irregular, disk with a few punctures as large as those on head, finer and fairly close along margins. *Elytra* subovate, a third wider than prothorax and two-thirds longer than wide, slightly dilated behind, shoulders moderately square, surface rather scantily punctate, with both rounded and cuneiform punctures of variable size, disk nearly smooth, suture rather widely impunctate, humeral ridge just visible, a slight depression between it and shoulder. The microsculpture is formed by a reticulation of fine isodiametric meshes, which in certain lights have the appearance of minute punctures, distinct on the elytra, but finer and fainter on head and prothorax. *Stridulating apparatus* present only in the ♂, and sometimes rudimentary or even wanting.

Length, 17·5–20 mm.

ASSAM : Sylhet ; Nemotha (Cachar). SIKKIM : Darjiling. BENGAL : Sahibganj (*J Wood Mason*) ; Narail. BIHAR : Pusa ; Pupri. ORISSA : Puri dist., Balighai (*N Annandale*).

Type in Mr. René Oberthür's collection.

I have seen three examples of this species in which the lateral grooves on the prothorax were practically uninterrupted.

77. **Siagona polita**, *Andr.* [Fig. 32 (5) & Plate V, fig. 6.]

Siagona polita, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 180 ; Bänninger, Ent. Blätt. 1928, p. 56.

Siagona atrata, Bates (not Dej.), Ann. Mus. Civ. Gen. xxxii, 1892, p. 284 ; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 146.

The resemblance to *atrata* is very marked, but the following differences are noticeable. *Head* smoother, with only a few small punctures on front and vertex, lateral ridges uninterrupted, but appearing more angular at the bend ; eyes rather more prominent. *Prothorax* similar in shape, though slightly more contracted in front, median line and lateral grooves deeper, the latter showing much less evidence of interruption on disk, the puncturation of the surface slight and almost confined to front and hind margins. *Elytra* similar in shape, though slightly longer, and practically smooth, with only some slight puncturation close to base and sides, the larger pores near base and along sides standing out much more on account of their isolation. The microsculpture is similar. *Stridulating*

apparatus sometimes present in the ♂, but often rudimentary or wanting.

Length, 20–24 mm.

BURMA: Tharrawaddy and Paungde (*G. Q. Corbett*); Rangoon (*Armstrong* and *L. Fea*); Tikekee in Pegu (*L. Fea*); Theinzeik (*P. Loiseau*); Moulmein (*J W Helfer*); Insein (*D. J Atkinson*).

Type in my collection.

78. **Siagona obscuripes**, *Chaud.* [Fig. 32 (11).]

Siagona obscuripes, Chaudoir *, Mon. p. 86; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 146; Bänninger, Ent. Blätt. 1928, p. 56, t. f. 4.

Siagona subtilis, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 284.

Body winged, shiny, covered with a somewhat scanty flavous pubescence.

Colour black, palpi piceous.

Head moderately wide, clypeal suture fairly deep, lateral ridges subinterrupted, more or less angulate at the bend, not quite reaching the very deep neck constriction; surface lightly punctate, middle of front and neck smooth; mandibles ♂ slightly dilated laterally and with a short basal ridge; supramaxillary plates conspicuous, with parallel sides, apical angle rounded, antennæ reaching middle of elytra, joint 1 strongly clavate. *Prothorax* about a fourth wider than head, and fully a third wider than long, base slightly and apex widely emarginate, sides strongly rounded in front and sharply contracted behind; median line extremely fine, lateral grooves deep and with only a suggestion of interruption on disk; surface moderately punctate along margins and median line, rather sparsely elsewhere. *Elytra* subovate, with moderately square shoulders, surface finely and not very closely punctate, suture impunctate, humeral ridge only just visible, though the pores along its course are clear. Microsculpture rather punctiform and not strongly developed. *Stridulating apparatus* well developed in both sexes.

Length, 15–17 mm.

BURMA: Tharrawaddy and Paungde (*G. Q. Corbett*); Senmigion and Palon (*L. Fea*); Theinzeik (*P. Loiseau*); Rangoon (*E. A. d'Abreu* and *L. Fea*); Tenasserim (*J. W Helfer*).

Type in Mr. René Oberthür's collection; that of *subtilis* in the Genoa Civic Museum.

Bates gives the dimensions as 12·5–16 mm., but I have seen no specimens of under 15 mm. in length. In an example from Rangoon the legs are dark red, but it does not differ otherwise from the typical form. The species is very much like *atrata*, and differs chiefly in its smaller size and less scanty puncturation.

79. **Siagona europea**, *Dej.* [Fig. 32 (12).]

Siagona europea, Dejean *, Spec. Gen. ii, 1826, p. 468; Dejean et Boisduval, Icon. et Hist. Nat. Col. Eur. i, 1830, p. 191, t. 20. f. 2; Rambur, Faune Ent. Andal. i, 1837, p. 41; Küster, Käf. Eur. xv, 1848, p. 7; Chaudoir, Mon. p. 91 (part); Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470; id., Rec. Ind. Mus. xviii, 1919, p. 100; id., Trans. Ent. Soc. Lond. 1921, p. 158; id., Ent. Mitt. 1927, p. 143; Bänninger, Ent. Blätt. 1928, pp. 56 and 59, t. f. 8.
Siagona depressa, Bedel (not F.), Ann. Soc. Ent. Fr. 1887, p. 195 (part); id., Cat. rais. Col. N. Afr. 1897, p. 108 (part).

Body winged, shiny, covered by a rather inconspicuous flavous pubescence.

Colour black or piceous, palpi brown.

Head rather small, moderately convex, clypeus emarginate, clypeal suture only moderately impressed, lateral ridges fine, gently rounded at the bend, uninterrupted, diverging behind, and reaching about mid-eye level; neck constriction deep, surface finely and rather closely punctate, including the area immediately behind neck constriction, disk with rather fewer punctures; mandibles small, the teeth much reduced in size, similar in the two sexes; supramaxillary plates rather inconspicuous, rounded in front; antennæ reaching middle of elytra, joint 1 moderately clavate. *Prothorax* a sixth wider than head and a fourth wider than long, apex only slightly emarginate, sides very little contracted in front, sharply rounded behind; median line extremely fine, lateral grooves deep only at extremities, very shallow on disk, puncturation fine and not very close, a little coarser on middle and sparser at sides of disk. *Elytra* nearly oval, shoulders oblique but evident, a sixth wider than prothorax and nearly twice as long as wide, surface finely and not very closely punctate, more finely towards apex, the punctures rounded, humeral ridge just visible, as are the pores at base and along sides, suture slightly raised and narrowly impunctate. Microsculpture formed by a reticulation of hardly visible isodiametric meshes, wanting on head and prothorax. *Stridulating apparatus* wanting.

Length, 9·5–12·5 mm.

Baluchistan: Seistan (*S. W Kemp*—Ind. Mus.). Irak. Arabia. Syria. Transcaspia. Mediterranean Basin.

Type in Mr. René Oberthür's collection.

In his Monograph Chaudoir mentions specimens of this species from Nubia and Abyssinia, probably correctly, and others from Senegal, which appears a more doubtful locality. He confused with *europea* the very common Indian species to which I have given the name of *fabricii*, and when I was at Rennes I noticed in the Chaudoir collection, among other Indian examples, one or two small ones labelled Bengal and Bombay,

which at the time appeared to me to resemble *europea*. Chaudoir also refers to an Indian example of *europea*, var. *oberleitneri*, Dej. (Spec. Gen. v. 1834, p. 477), which differs only from the typical form in having a large dark red patch on the elytra; this I did not see. I think it unlikely that *europea* will be found to occur in India, but for the present the question remains unsettled.

80. Siagona apicalis, *Andr.*

Siagona apicalis, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 181; Bänninger, Ent. Blätt. 1928, p. 56.
Siagona cinctella, Bates (not Chaud.), Ann. Mus. Civ. Gen. xxxii, 1892, p. 285; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 146.

Body winged.

Colour piceous black; antennæ, palpi, metasternum, venter, tibiæ, and tarsi brown or dull red; apex of elytra reddish, the colour extending vaguely forward along margin towards shoulder.

Head with the clypeal suture moderately deep, lateral ridges fine, uninterrupted, rather sharply rounded at the bend, diverging a little behind and reaching mid-eye level, neck constriction deep; surface closely punctate, including a narrow belt behind neck constriction, a small nearly smooth patch on middle of front; mandibles small, externally bordered at base; supramaxillary plates with parallel sides, rounded in front, genæ unusually conspicuous; antennæ nearly reaching middle of elytra, joint 1 very narrow at base and strongly clavate. *Prothorax* about a fifth wider than head and a third wider than long, sides only contracted in front near the angles, but contracted sharply behind; median line extremely fine, lateral grooves moderately deep, subinterrupted on disk; surface finely and closely punctate, hardly less so on disk. *Elytra* very flat, subovate, shoulders fairly conspicuous, a little wider than prothorax and about three-fourths longer than wide, closely and finely punctate, a little more closely at sides, the punctures subelongate, suture narrowly impunctate, a shallow depression on each side behind shoulder, humeral ridge slight. Microsculpture distinct on elytra, indistinct on head and prothorax. *Stridulating apparatus* wanting.

Length, 11–12·5 mm.

Burma: Palon in Pegu (*L. Fea*); Yenangyaung, Magwe (*J. Coggin Brown*—Ind. Mus.).

Type in my collection.

S. cinctella, Chaud., is a smaller and shinier species, with the apex of the elytra light brown, and *S. flesus* is also smaller and much narrower, with a light border running right round

the elytra; in both species the lateral grooves on the prothorax are shallower, especially in front, where the groove bends round towards the front angle.

81. **Siagona flesus**, *F.* [Fig. 32 (13).]

Galerita flesus, Fabricius*, Syst. Eleuth. i, 1801, p. 216; Hope, Col. Man. ii, 1838, p. 99 (No. 7).

Siagona flesus, Dejean, Spec. Gen. i, 1825, p. 363; Motchulsky, Etudes Ent. 1855, p. 42; Chaudoir, Mon. p. 94; Bates, Ann. Soc. Ent. Fr. 1889, p. 264; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 285; Vuillet, Insecta, ii, 1912, p. 17; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 164; Bänninger, Ent. Blätt. 1928, p. 56, t. f. 11.

Siagona dorsalis, Dejean, Spec. Gen. v, 1831, p. 477; Bänninger, Ent. Blätt. 1928, p. 59.

Body winged, closely and shortly pubescent.

Colour pale brown, with a broad piceous longitudinal patch running down the middle of the elytra and occupying about half their area, widening a little behind, but not reaching apex.

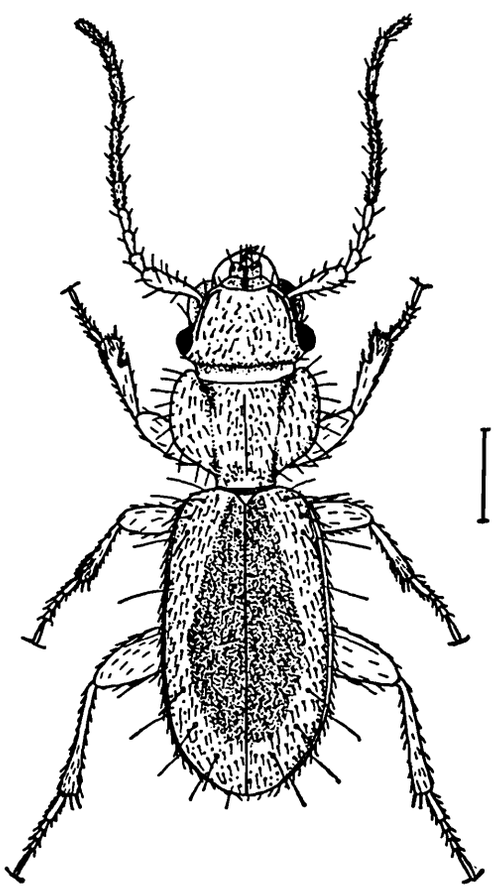


Fig. 34.—*Siagona flesus*, F.

Head moderately convex, clypeal suture lightly impressed, lateral ridges fine, rounded at the bend, uninterrupted, diverging slightly behind, and reaching mid-eye level, neck constriction deep; surface finely and fairly closely punctate, very

finely along the hind margin of the neck constriction, less closely on disk ; mandibles small and similar in the two sexes ; supramaxillary plates with parallel sides, rounded in front ; antennæ fairly stout, not quite reaching middle of elytra, joint 1 strongly clavate. *Prothorax* a little wider than head and about a third wider than long, apex widely but not deeply emarginate, sides rounded, though almost parallel at middle, not much contracted in front ; median line very fine, lateral grooves moderately deep at extremities, lightly impressed on disk ; surface rather finely and closely punctate, a little more sparsely at sides of disk. *Elytra* oval, though with evident shoulders, about a fifth wider than prothorax and rather less than twice as long as wide, surface closely, finely, and nearly uniformly punctate, a little less closely and more coarsely on disk, the punctures more or less round, the suture slightly raised and very narrowly impunctate, humeral ridge obsolete. Microsculpture evident on elytra, but very faint on head and prothorax. *Stridulating apparatus* wanting.

Length, 8–10 mm.

BENGAL. BIHAR. INDORE. CENTRAL PROVINCES. BOMBAY. MADRAS. BURMA. SIAM. LAOS. CAMBODIA. COCHIN-CHINA. SENEGAL.

Type in the Copenhagen University Museum.

The species being an extremely common one, I have not thought it necessary to insert here the large number of localities recorded in my notes. I have seen no specimen from North-West India or from Ceylon. The African *dorsalis* does not appear to differ materially from Indian specimens.

At Belgaum I took this species commonly round the rice-fields along with *fabricii* and other species.

82. Siagona cinctella, *Chaud.*

Siagona cinctella, Chaudoir *, Mon. p. 95; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 182.

This species is very nearly allied to *flesus*, but the colour is piceous, with a light brown border of moderate width extending along the apical third of the elytra.

The length is the same as that of *flesus*, but the width is rather greater. The head is a little larger, the lateral ridges a little shorter and less distinct, and the eyes, though no smaller, are somewhat less convex ; the sides of the prothorax are rather more parallel in front, the front angles are more narrowly rounded and the lateral grooves a little deeper.

Length, 9 mm.

BURMA : Rangoon.

Type in Mr. René Oberthür's collection.

The two specimens described by Chaudoir are the only examples at present known. They had apparently been immersed for a long period in alcohol, and it may prove that they are not more than a variety of *flesus*, though when I examined them some years ago they appeared to me to constitute a distinct species.

83. Siagona plana, *F.*

Galerita plana, Fabricius *, Syst. Eleuth. i, 1801, p. 216.
Siagona plagiata, Chaudoir *, Mon. p. 93.
Siagona plana, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 163; Bänninger, Ent. Blätt. 1928, p. 56.

Body winged, moderately pubescent.

Colour dark piceous, palpi and tarsi brown, the greater part of disk of elytra red-brown, the size of the coloured patch being very variable.

Head small, clypeus only slightly emarginate, clypeal suture fairly deep, lateral ridges fine, uninterrupted, gently rounded at the bend, diverging very slightly behind and hardly reaching beyond mid-eye level, neck constriction deep; surface finely and fairly closely punctate, including the hind margin of the constriction, disk more sparsely punctate; mandibles small but very sharp; supramaxillary plates conspicuous, with parallel sides, rounded in front; antennæ about reaching middle of elytra, joint 1 only moderately clavate. *Prothorax* a sixth wider than head and a third wider than long, apex moderately emarginate, sides rounded and evidently contracted in front; median line extremely fine, lying in a longitudinal depression, lateral grooves deep only at extremities, very lightly impressed on disk; puncturation irregular, not very close, coarser than on head, rather sparse on disk. *Elytra* nearly oval, though with well marked shoulders, about a fourth wider than prothorax, barely two-thirds longer than wide, surface fairly closely and uniformly punctate, the punctures, which are round, a little larger and less closely placed on disk, suture somewhat raised and narrowly impunctate, humeral ridge obsolete. Microsculpture distinct on apical half of elytra, but hardly visible elsewhere. *Stridulating apparatus* wanting.

Length, 10–11·5 mm.

Bengal: Dacca. Orissa: Satpara (*N Annandale*). Madras: Barkuda Island in Lake Chilka (*N Annandale*); Trichinopoly; Shembaganur. Ceylon: Hambegamuwa; Wirawila; Murunkan (*G. M Henry*).

Type in the Copenhagen University Museum; that of *plagiata* in Mr. René Oberthür's collection.

Chaudoir gives the locality as the "Deccan," for which

we must presumably read "Dacca"; I have not, however, seen any other examples from Bengal. The species is not common anywhere, but seems to be most frequently met with in Madras and Ceylon.

84. **Siagona rubescens**, sp. nov.

Body winged.

Colour piceous, a spot on middle of head and disk of prothorax dark red, antennæ, prosternum, and venter more or less brown, metasternum and legs pale ferruginous.

Head rather small, clypeal suture lightly impressed, lateral ridges fine, uninterrupted, rounded at the bend, diverging behind, and extending just beyond mid-eye level, neck constriction deep; surface rather finely and not very closely punctate, with a considerable area on middle of front practically smooth, front of neck, adjoining the constriction, closely and finely punctate; mandibles small, with a wide external border at base; supramaxillary plates with parallel sides, widely rounded in front; antennæ reaching middle of elytra, joint 1 rather suddenly dilated at middle. *Prothorax* a third wider than head, a fourth wider than long, sides slightly rounded, contracted moderately in front and rather less sharply than usual behind; median line extremely fine, lateral grooves deep at extremities, subinterrupted on disk; surface moderately and not very closely punctate, more coarsely than head on each side of median line. *Elytra* nearly oval, with shoulders which are evident, though not well marked, a little wider than prothorax, three fourths longer than wide, surface fairly closely punctate, not so coarsely even in front as on disk of prothorax, very finely behind, the punctures round, suture very narrowly impunctate, humeral ridge obsolete, though an oblique row of 4 or 5 pores can be seen running across shoulder. Microsculpture unusually clear on elytra, just visible on sides of prothorax and head. *Stridulating apparatus* wanting.

Length, 12 mm.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*).

Type in my collection.

The type is unique and was taken under cow-dung.

85. **Siagona pumila**, *Andr.* [Fig. 32 (14) & Plate VI, fig. 2.]

Siagona plana, Bonelli* (not F.), Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 458; Hope, Col. Man. ii, 1838, p. 99 (No. 6); Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470; id., Ann. Mus. Civ. Gen. xlix, 1922, p. 390.

Siagona depressa, Dejean* (not F.), Spec. Gen. i, 1825, p. 361; id., Spec. Gen. v, 1831, p. 476; Chaudoir, Mon. p. 90.

Siagona pumilus, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 164; Bänninger, Ent. Blätt. 1928, p. 56, t. f. 7.

Body winged, subconvex, shiny, covered with short pale pubescence.

Colour piceous to black, palpi and legs ferruginous.

Head moderately convex, clypeal suture clearly impressed, lateral ridges rather fine, rounded at the bend, generally uninterrupted, though sometimes vaguely interrupted, hardly diverging behind and not quite reaching hind-eye level, neck constriction deep; surface finely and fairly closely punctate, including the area immediately behind neck constriction, nearly smooth on vertex; mandibles small, but sharp, similar in the two sexes; supramaxillary plates conspicuous, with parallel sides, rounded in front; antennæ stout, nearly reaching middle of elytra, joint 1 strongly clavate. *Prothorax* about a sixth wider than head and a third wider than long, apex only slightly emarginate, sides rounded and evidently contracted in front; median line very fine, lying in a longitudinal depression, lateral grooves deep throughout; surface closely punctate, only a little more sparsely at sides of disk. *Elytra* only moderately flat, subovate, with strongly marked shoulders, very little wider than prothorax, two-thirds longer than wide, surface rather closely and evenly punctate, with more or less cuneiform punctures, which are a little coarser in front and finer behind, suture raised, narrowly impunctate, humeral ridge just visible, the pores across shoulder very distinct. Microsculpture conspicuous on elytra and quite visible on head and prothorax. *Stridulating apparatus* wanting.

Length, 10–11 mm.

BENGAL: Dacca; Saidpur (*E. A. d'Abreu*); Murshidabad; Calcutta. BIHAR: Pusa, Chapra (*Mackenzie*); Purnea district, Kierpur (*C. Paiva*). UNITED PROVINCES: Dehra Dun (*H. G. Champion*). CENTRAL PROVINCES: Nagpur district, Munser (*E. A. d'Abreu*). BOMBAY: Belgaum district, Nagargali (*H. E. Andrewes*). MADRAS: Madura; "Coromandel."

Type in the Turin Natural History Museum; that of Dejean's *depressa* in Mr. René Oberthür's collection.

A specimen in the Prague Museum labelled "Moulmein (*Helfer*)" probably came from North India.

86. **Siagona angustipennis**, *Bates*. [Plate VI, fig, 3.]

Siagona angustipennis, Bates*, Ann. Mus. Civ. Gen. xxxii, 1892, p. 286; Bänninger, Ent. Blätt. 1928, p. 56.

Body apterous, subconvex.

Colour piceous-black; antennæ, palpi, and mandibles more or less reddish, legs ferruginous.

Head with the clypeal suture only moderately impressed, lateral ridges fine, uninterrupted, rounded at the bend, parallel behind, and practically reaching the very deep neck constriction ; surface rather finely and closely punctate, a little less closely on middle of front, including the whole of neck, except a small area in the middle at back ; mandibles rather small and slightly developed ; supramaxillary plates with parallel sides, strongly rounded in front ; antennæ stout, not quite reaching middle of elytra. *Prothorax* a little wider than head, and about a fourth wider than long, sides rounded, only slightly contracted in front, but rather sharply behind ; median line extremely fine, lateral grooves very deep throughout, a vestige of a transverse impression across middle of front margin, surface closely and nearly uniformly punctate, hardly less so at sides of disk. *Elytra* narrow, elongate-oval, with shoulders practically rounded away, barely wider than prothorax and fully twice as long as wide, surface closely punctate throughout, disk only a little less closely than sides, the punctures mostly cuneiform, suture very narrowly impunctate, the humeral ridge on each side, and the rows of pores across shoulders and down sides unusually conspicuous. Microsculpture on elytra visible, but not well defined, hardly visible on head and prothorax. *Stridulating apparatus* wanting.

Length, 11 mm.

BURMA : Palon and Tikekee, both in Pegu (*L. Fea*).

Type in the Genoa Civic Museum.

The three examples captured by Mr. Fea are the only known specimens ; all seem to be ♀.

87. Siagona pygmæa, *Andr.*

Siagona pygmæa, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 410 ; Bänninger, Ent. Blätt. 1928, p. 56.

Body apterous.

Colour dark red, legs a little lighter ; head, a longitudinal stripe on each side of the prothorax, the margins and suture of elytra, and a vague shade on disk piceous.

Head with the clypeus a little depressed at middle, clypeal suture fine, lateral ridges uninterrupted, thick in front, rounded at the bend, narrow, diverging, and somewhat irregular behind, reaching approximately mid-eye level, neck constriction deep ; surface closely punctate, the area immediately behind the neck constriction very finely punctate ; mandibles very small, bordered externally at base ; supramaxillary plates small, converging forwards, rounded in front ; eyes very small and inconspicuous from above ; antennæ exceptionally thick and long, extending rather beyond middle of elytra, joint 1 gradually dilated. *Prothorax* nearly a third wider than head,

about a fifth wider than long, apex emarginate, the front angles evident though rounded, sides not much contracted in front, but very evenly rounded behind from the middle to a point just in front of base; median line just visible, lateral grooves fairly deep, subinterrupted; surface closely punctate throughout. *Elytra* oval, the shoulders barely visible, as wide as prothorax and three-fourths longer than wide; surface closely punctate, with chiefly rounded punctures, which extend almost to suture, humeral ridge obsolete, a few pores visible across shoulders and along sides. Microsculpture present, but very indistinct. *Stridulating apparatus* wanting.

Length, 8·5 mm.

BOMBAY: Belgaum (*H. E. Andrewes*).

Type in my collection.

These specimens were captured along the borders of the rice-fields along with those of *fabricii*, etc. This and *kulla* are the two smallest species known to me in the genus.

88. **Siagona kulla**, *Andr.* [Plate VI, fig. 1.]

Siagona kulla, Andrewes, Ann. Mag. Nat. Hist. (9) vii, 1921, p. 411; Bänninger, Ent. Blätt. 1928, pp. 56 and 59.

Body winged.

Colour piceous; antennæ, venter, and legs (except femora) dark red.

Closely allied to *pygmæa*, but much darker, more shiny, with relatively smaller head and prothorax, and differing otherwise as follows:—*Head* a little narrower, both lateral ridges behind and sides of supramaxillary plates parallel, eyes much more prominent, surface less closely punctate. *Prothorax* with the front angles more broadly rounded, the lateral grooves less deeply impressed, the surface not quite so closely punctate, the punctures rather larger than those on the head. *Elytra* very slightly longer and not quite so flat, the shoulders much more evident, the puncturation slightly finer and less close. Microsculpture on elytra only moderately distinct and apparently consisting in minute punctures, hardly visible on head and prothorax. *Stridulating apparatus* wanting.

Length, 7·75–8·5 mm.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu* and *H. M. Lefroy*).

Type in my collection.

89. **Siagona dilutipes**, *Chaud.* [Fig. 32 (8).]

Siagona dilutipes, Chaudoir *, Bull. Mosc. 1850, i, p. 440; id., Mon. p. 106; Bänninger, Ent. Blätt. 1928, p. 56.

Body apterous.

Colour piceous legs and (to some extent) palpi ferruginous

Head wide, clypeus depressed along median line, the depression often extending to front, clypeal suture rather fine, lateral ridges thick in front, rounded or very obtusely angulate and distinctly interrupted at the bend, nearly reaching the rather shallow neck constriction; surface moderately punctate, but a rather large area on middle of front is practically smooth, neck smooth, with a few small punctures at sides; mandibles stout, ♂ outwardly dilated and with a rather sharp carina on upper surface at base; supramaxillary plates with parallel sides, subangulate in front (♀) rather strongly dilated and externally rounded (♂); antennæ not quite reaching middle of elytra, joint 1 strongly clavate. *Prothorax* a fifth wider than head and a fourth wider than long; sides only moderately contracted in front; median line extremely fine, lateral grooves moderately deep at extremities, subinterrupted on disk; surface closely and finely punctate along margins, but the disk is largely smooth, even near median line, with only a few scattered punctures. *Elytra* oval, with shoulders only just visible, practically as wide as prothorax, and about two-thirds longer than wide, surface closely and rather coarsely punctate, more closely and finely along sides, a fairly wide impunctate strip along suture, the punctures cuneiform and to some extent confluent, the humeral ridge and pores quite visible, a slightly depressed subrugose area behind shoulder. Microsculpture fairly visible on elytra, finer and less obvious on head and prothorax. *Stridulating apparatus* present in ♂ only.

Length, 16–18 mm.

PUNJAB: Simla (*Capt. Boys*). INDORE: Mhow. BOMBAY: Belgaum (*H. E. Andrewes*). "North West India" (Brit. Mus.).

Type in Mr. René Oberthür's collection.

Taken at Belgaum during the rains with *fabricii* and other species along the borders of the rice-fields.

89 *a*. **Siagona dilutipes**, *Chaud.*, var. **aligera**, var. nov.

Among the Belgaum specimens captured approximately at the same time and place as those referred to above is a large ♂ example, in which the mandibles are unusually developed, both laterally and on the upper surface. The carinæ are larger and thicker than those on the typical ♂, and almost form short horns. The supramaxillary plates are also more developed and jut prominently outwards on each side. In addition there are well-developed wings, so that in this species, as in *pubescens* and *depressa*, there seems to be a winged form and an apterous one.

Length, 20 mm.

BOMBAY: Belgaum (*H. E. Andrewes*)*.

Type in my collection.

* A ♀ example has recently been received from the Forest Research Institute, Dehra Dun, labelled "Central Provinces, Balaghat, Baihar."

90. **Siagona rustica**, sp. nov. [Fig. 32 (15).]

Body apterous.

Colour piceous, legs ferruginous.

Head wide, clypeus impressed along median line, clypeal suture rather fine, lateral ridges thick in front, subinterrupted and angular at the bend, fine behind and nearly reaching the shallow neck constriction ; surface very sparsely punctate, middle of front and neck smooth ; mandibles stout, a little dilated at base, left mandible externally somewhat transversely striate, the tooth a little raised, inner margin with one or two striæ, but without carina, right mandible with a short rounded carina ; supramaxillary plates wide, somewhat dilated and subangulate in front, the eyes, though convex, not extending laterally beyond them ; antennæ reaching middle of elytra. *Prothorax* barely wider than head, fully a third wider than long, apex rather deeply emarginate, sides contracted slightly in front, rather sharply behind ; median line extremely fine, lateral grooves deep, hardly less so on disk ; surface smooth, except along front and hind margins, only one or two scattered punctures elsewhere. *Elytra* nearly oval, with shoulders visible, but not at all pronounced, hardly wider than prothorax, three-fourths longer than wide, surface very coarsely and irregularly punctate, rather sparsely on disk, closely at sides, shoulders subrugose, the punctures cuneiform, a short humeral ridge, with half a dozen pores, clearly visible. Microsculpture clear on elytra, just visible on head and prothorax. *Stridulating apparatus* well developed in both sexes.

Length, 18 mm.

BURMA : Pegu district.

Type in the Indian Museum, Calcutta.

The absence of wings and the rough, irregular sculpturing of the elytra will render the species fairly easy to identify.

In order that no described species may be omitted, two further names must be recorded here, though the species or varieties to which they refer are unrecognizable. In the second part of his ' Observations Entomologiques ' (Mém. Acad. Sci. Turin, 1813, p. 459), Bonelli, in writing of his own *Siagona plana* (=*pumila*, Andr.), mentions two specimens, under the names of *Carabus sulcicollis*, Meg., and *Carabus lunulatus*, Meg., which, as Megerle did not publish descriptions of them, must be taken as equivalent to *Siagona sulcicollis* and *S. lunulata*, both Bonelli.

Bonelli writes : " In the specimen [of *plana*] which I possess and which came to me from Dr. Klug, the prothorax has three sulci, of which the two lateral ones are fairly deep and well marked, occupying the entire length of the prothorax, and the intermediate one wide, shallow, and as it were divided into

two by a slight raised line, only occupying the basal half. But in an example in the collection of Mr. Boissier (it was there labelled *Carabus sulcicollis*, Meg.), which I have examined, and which in other respects was exactly like the other, the median sulcus was narrow and as deep as the lateral ones.

"I saw in the same collection a third specimen, resembling the one which I have described, but which was a third smaller, being only 9 mm. long and 2·5 mm. wide. It was named *Carabus lunulatus*, Meg. Perhaps it is the ♂ of the former.

"This species [i. e., *S. plana*, Bon., and presumably also the other two examples] comes from the East Indies."

Mr. M. Bänninger writes me that he has searched unsuccessfully for these two examples in the Boissier collection at the Geneva Museum (see also Ent. Blätt. 1928, p. 63), and Dr. A. Borelli, who kindly searched in the Turin Museum at my request, was unable to find any trace of them there. The names therefore become mere Catalogue names, but have, nevertheless, a certain importance because they cannot be used again in the genus.

Genus **LUPERCA.**

Luperca, Castlenau, Hist. Nat. Ins. Col. i, 1840, p. 63; Lacordaire, Gen. Col. i, 1854, p. 163; Andrewes in Mission Babault Ind. Carab. 1924, p. 13.

Holoscelis, Chaudoir, Bull. Mosc. 1850, i, p. 438; id., Mon. des Siagonides, Bull. Mosc. 1876, i, p. 71.

TYPE, *Carabus lævigatus*, F. (India.)

Form flat and fairly wide, body winged, glabrous. A microsculpture is present on the elytra, which forms a reticulation of very small isodiametric meshes; this is largely masked in the Indian species by the alutaceous nature of the surface, but clearly visible in the African species, the upper surface of which is extremely shiny and, to the naked eye, absolutely smooth.

The generic characters are very largely those of *Siagona*, but the solitary Indian species exceeds in its dimensions the largest *Siagona*, and in other respects it differs as follows:—

Head with the lateral ridges much slighter, neck unconstricted, eyes less prominent, with two supraorbital pores and setæ, supramaxillary plates less developed, labrum 6-setose, clypeus with a setiferous pore near each of the four angles, clypeal suture very fine, mandibles as in *Siagona* ♀, but with a short wide scrobe at base, ligula carinate beneath, concave and bisetose at apex, completely surrounded by the coriaceous paraglossæ, from which a thin strip projects on each side in front, slightly curved in the African, bent inwards

at a right angle in the Indian species, the mentum, maxillæ, and palpi as in *Siagona*, but the mentum and submentum are separated by a transverse ridge and joint 2 of the labial palpi is bisetose, antennæ with joints 1 to 4 glabrous, though 3 and 4 are pilose at apex, joint 1 relatively shorter and much less clavate. *Prothorax* flatter and wider, base very little produced, apex truncate across middle, then with a sharp curve on each side to front angles, which project further and are sharper, sides more thickly bordered and more evenly rounded, with four setiferous pores on each side in the marginal channel, lateral grooves wanting. *Elytra* flat, without striæ, a setigerous pore on each close to base, another on shoulder, and a dorsal series of 4 pores, marginal series as in *Siagona*. No stridulatory apparatus is present (at least none similar to that in *Siagona*). In the African species the prosternal process is bordered, in the Indian one unbordered ; the metepisterna are not so narrow, and the ventral segments are not transversely sulcate. The underside is nearly glabrous, but there are some setiferous pores at the sides of the pro- and mesosterna, and transverse rows of setæ on each side of ventral segments 2 and 3. The excision on the inner margin of the protibiæ is both smaller and nearer the apex, and the variable spur is consequently also nearer the apex ; the mesotibiæ are furnished with a much smaller pad of hairs.

Range. India and Africa.

There are only two species in the genus, viz., *lævigata*, F., in India, and *goryi*, Chaud., in Africa ; these are very similar in size and form, but the upper surface of the former is dull, whereas that of the latter is polished and shiny. Nothing is known regarding the biology of either species, but I have a note that an example of *lævigata* in the Pusa Collection was taken in the Central Provinces at Hoshangabad "in a termiterium."

Writing of his *goryi* in the Monograph, Chaudoir tells us that in a certain light vestiges of striæ are visible on the elytra, but, when referring later to *lævigata* he says that no such vestiges are present. This is inaccurate, for they can be seen in both species, placed very close together, and apparently numbering about 15 or 16.

91. **Luperca lævigata**, *F.*

Carabus lævigatus, Fabricius, Spec. Ins. i, 1781, p. 304.
Scarites lævigatus, Olivier, Ent. iii, 36, 1795, p. 7, t. 2. f. 18.
Enceladus lævigatus, Dejean, Spec. Gen. v, 1831, p. 474 ; Hope, Col. Man. ii, 1838, p. 99.
Siagona herculeana, Castlenau, Etudes Ent. 1835, p. 151.

Luperca herculeana, Castlenau, Hist. Nat. Ins. Col. i, 1840, p. 63.
Luperca lævigata, Lacordaire, Gen. Col. i, 1854, p. 164 and Atlas, t. 6. f. 1; Dohrn, Stett. Ent. Zeit. 1881, p. 309; Heyne-Taschenberg, Die Exotischen Käfer, 1895, p. 16, t. 3. f. 10; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 122; id., Trans. Ent. Soc. Lond. 1921, p. 154; id., in Mission Babault Ind. Carab. 1924, p. 13.
Holoscelis lævigatus, Chaudoir, Mon. des Siagonides, Bull. Mosc. 1876, i, p. 74.

Colour black, surface dull, coriaceous.

Head wide and rather flat, clypeus emarginate in front, lateral ridges very narrow, uninterrupted, and subangulate in front, diverging behind and not quite reaching hind-eye level; surface uniformly and extremely finely punctate, with a few vague irregular striæ; supramaxillary plates smooth and shiny, conspicuous in front, the margin curving round evenly from base to apex; antennæ long and filiform, tapering

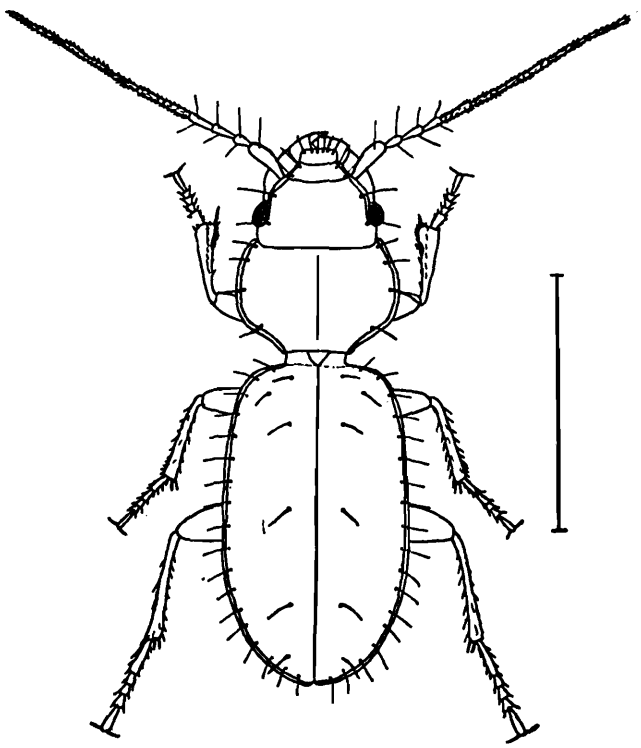


Fig. 35.—*Luperca lævigata*, F.

and extremely slender at apex, reaching middle of elytra, joint 1 moderately dilated, shorter than the next three joints taken together, 2 not much shorter than 4. *Prothorax* transverse, about a third wider than head and as much wider than long, sides strongly rounded, with rather a thick rough border, the four pores in the marginal channel placed two close to front angle, one a little before middle, and one approximately on the site of the missing hind angle; median line very fine,

no other impressions, surface resembling that of the head. *Elytra* broadly oval, flat, though slightly more convex than in *Siagona*, slightly wider than prothorax and two-thirds longer than wide, without impressions,except traces of microscopic punctures, chiefly visible on disk and near base, indicating the site of some fifteen or sixteen striæ, the surface uniformly and minutely rugose-punctate.

Length, 24–28 mm.

BENGAL. BIHAR: Pusa; Patna. ORISSA: Balasore (*Gengler*); Satpara and Balugaon (*N Annandale*). UNITED PROVINCES: Sultanpur. CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*); Hoshangabad. BOMBAY: Sampgaon, Belgaum district (*R. P. Barrow*). MADRAS: Coimbatore; Surada (*Rey*). "Deccan." "Coromandel." A specimen in the British Museum is labelled "Nusserabad," but there are several places of that name in India, Baluchistan, and Persia.

Type in the British Museum; that of *herculeana* lost.

Group X. SCARITINI.

This large group contains numerous genera and species scattered all over the globe, and is well represented in India.

The body is pedunculate and wings are sometimes present, sometimes absent. The front legs are adapted for digging, the protibiæ being flattened and outwardly digitate, inwardly excised and with the variable spur at the base of the excision. The antennæ are concealed at their point of insertion by a lateral expansion of the head, the mandibles are without seta in the scrobe, the mesosternum is not carinate in front, the procoxal cavities are closed behind, and the scutellum is not inserted between the elytra, but placed on the peduncle which unites the front and hind parts of the body.

I have not had the opportunity of examining nearly all the numerous genera of this immense group, and the subjoined key to the subgroups, though in the main of general application, has been prepared with special reference to the genera occurring in the Indian region. With two exceptions, the names of all these subgroups are derived from those of genera found in India, but the PASIMACHIDES take their name from the North American genus *Pasimachus*, and the OXYSTOMIDES from the South American genus *Oxystomus*. Among the SCARITIDES only one genus appears here, not included in Chaudoir's Monograph, but one of the genera which he included has been formed into a separate subgroup.

Key to the Subgroups.

1 (12) Prothorax without grooves on the underside for the reception of the antennæ.

2 (9) Head with one or no supraorbital seta on each side, antennæ with joint 1 nearly always scapiform, with a groove for its reception below the eye, more or less pubescent from joint 5 onwards, labial palpi with joint 2 usually plurisetose.

3 (8) Body convex, but rarely subcylindrical, head without central tubercle, prosternum not carinate or vertically dilated along median line.

4 (5) Buccal fissure (except in *Scarites rectifrons*) extending backwards, at least for a short distance, beyond base of mentum and separating the submentum and paragenæ, head with one supraorbital seta on each side. SCARITIDES, p. 210.

5 (4) Buccal fissure not extending backwards beyond base of mentum.

6 (7) Head with one supraorbital seta, maxillæ with the outer lobe not longer than the inner one, elytra very convex, so that the border is invisible from above. OXYLOBIDES, p. 292.

7 (6) Head without supraorbital setæ (in the Indian genus), maxillæ with the outer lobe longer than the inner one, elytra moderately convex, the border visible from above .. PASIMACHIDES, p. 324.

8 (3) Body subcylindrical, head with a central tubercle, prosternum carinate or vertically dilated along median line. SCAPTERIDES, p. 327.

9 (2) Head with at least two supraorbital setæ on each side, antennæ with or without a scape and groove, pubescent from joint 3 or joint 4 onwards, labial palpi nearly always bisetose.

10 (11) Head with clypeus and frontal plates fused, mandibles long, slender, strongly curved, and very sharp at apex, genæ much developed, as long and prominent as eyes, separated from head by a deep sulcus..... OXYSTOMIDES, p. 339.

11 (10) Head with clypeus and frontal plates not completely fused, mandibles normal (except in *Clivina forcipata*), genæ only slightly developed .. CLIVINIDES, p. 343.

12 (1) Prothorax with grooves on the underside for the reception of the antennæ. ZELMIDES, p. 416.

Subgroup I. *SCARITIDES.*

All the Indian genera comprised in Chaudoir's Monograph are included here, except the genus *Oxylobus*, which has been treated as forming a new subgroup, and one new genus has been added. As thus constituted the subgroup contains four genera, of which three are peculiar to the Indian region, the remaining genus, *Scarites*, with its numerous species, being distributed all over the world, except in the Australasian region.

Key to the Genera.

1 (6) Maxillæ obtuse at apex. (Insects with a comparatively short hind body, the elytra generally about a half longer than wide, strongly rounded at sides and widest at about middle.)

2 (3) Venter with the three apical segments (except in *glabriculus*) transversely sulcate (genus confined to Ceylon) . . . COPTOLOBUS, [p. 210.

3 (2) Venter with the three apical segments not transversely sulcate (genera absent in Ceylon).

4 (5) Elytra with intervals 3, 5, and 7 more or less costate or carinate, interval 7 carinate throughout . . GNAPHON, p. 216.

5 (4) Elytra with intervals 3, 5, and 7 not costate or carinate, interval 8 sometimes carinate near apex . . . . . HAPLOGASTER, [p. 220.

6 (1) Maxillæ hooked at apex. (Insects with hind body either long and parallel-sided, the elytra generally more than a half longer than wide, or, if shorter and with rounded sides, usually widest behind middle.) SCARITES, p. 225.

Genus **COPTOLOBUS.**

Coptolobus, Chaudoir, Bull. Mosc. 1857, ii, p. 59; id., Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p 159.

TYPE, *Coptolobus glabriculus*, Chaud. (Ceylon.)

Form rather short and wide, body apterous. *Head* large, quadrate, front angles generally rounded, clypeus bisetose, its front margin bidentate, frontal impressions rather shallow, a slight sulcus on each side above eyes, a neck constriction usually visible at sides; eyes small, not generally prominent, more or less enclosed by the genæ behind, separated from buccal fissure by a deep groove for the reception of the first joint of the antennæ, one supraorbital seta, about level with hind margin of eye, and a little removed from it; labrum very small, trilobed, a pore and seta on each lobe; mandibles stout,

as long as head, rather sharp, generally with a carina on upper surface, longer on the left than on the right one ; inner margin with a wide irregular tooth on lower half, right one, and sometimes left also, with a small tooth above it ; ligula short, concave, the point at its apex beneath forming the termination of the carina on the tooth of mentum, paraglossæ fairly wide, as long as ligula, each with a dense tuft of hairs at extremity ; mentum with a rather small emargination, which is more or less bordered, lobes rounded at sides and truncate at apex, tooth acute, extending beyond lobes, with a median carina towards apex which joins apex of ligula, epilobes forming little hollows on each side of tooth, paragenæ dentate ; buccal fissure extending beyond base of mentum ; maxillæ straight, obtuse at apex, densely fringed with hairs on inner and apical margins, outer lobe jointed and longer than inner one ; palpi rather slender, rounded at apex, maxillaries glabrous, joint 4 quite half as long again as 3, labials with joint 3 a little shorter than 2, which is plurisetose ; antennæ moniliform, geniculate, pubescent from joint 5, not reaching base of prothorax, the joints distinctly dilated towards extremity, 1 as long, or very nearly as long as the next four taken together, 11 a little longer, 4 a little shorter than the other joints, which are approximately equal in length. *Prothorax* convex, the outline forming rather more than a semicircle, the base very slightly truncate at middle but not produced, apex widely emarginate, front angles very little rounded but not conspicuous, sides and base with a fine reflexed border, no tooth at hind angles, basal foveæ and transverse impression obsolete. *Elytra* short, oval, and only moderately convex, a little pointed at apex, shoulders sometimes dentate, side border rounding shoulder and continuing to peduncle, base subtuberculate, depressed and somewhat emarginate at middle, epipleuræ wide at base, narrowing rapidly at first and then gradually to apex ; 8-striate, including marginal channel, which has an uninterrupted row of small umbilicate pores, no scutellary striole, the setiferous pores on disk practically in stria 3. *Sternum* : prosternal process unbordered ; metepisterna as long as wide. *Venter* with the segments bisetose, last segment with two marginal setæ on each side. *Legs* stout ; protibiæ wide, 3-dentate (including apex), mesotibiæ with a spur just above apex ; tarsi with joint 1 shorter than the next two taken together.

Range. Ceylon.

The genus is confined to Ceylon, and no specimens appear to have been taken even on the adjoining mainland of India.

Key to the Species.

1 (6) Elytra with border thickened and reflexed at shoulder, usually forming a tooth.
2 (5) Elytral striæ at least moderately impressed, surface smooth but not highly polished.
3 (4) Head with front angles obliquely truncate, neck constriction obsolete, prothorax with three lateral setæ on each side, base of elytra granulate .. *latus*, Andr., p. 212.
4 (3) Head with front angles rounded, neck constriction visible at sides, prothorax with two lateral setæ on each side, base of elytra not granulate. . *omodon*, Chaud., [p. 213.
5 (2) Elytral striæ very faintly impressed and only just visible, surface highly polished .. . . *glabriculus*, Chaud., [p. 214.
6 (1) Elytra with border not thickened at shoulder and without any tooth. *anodon*, Chaud., [p. 215.

92. **Coptolobus latus**, *Andr.*

Coptolobus latus, Andrewes, Spol. Zeyl. xii, 1923, p. 224.

Colour black ; palpi, antennæ, and tarsi more or less piceous. *Head* with front angles obliquely truncate, clypeal suture visible at middle, frontal impressions linear, nearly parallel, though converging slightly behind, a few vague striæ at sides, neck constriction barely visible even at sides, mandibles subcarinate at base, eyes moderately prominent, enclosed by genæ, which disappear gradually behind and project laterally nearly as far as eyes, antennæ with joint 2 barely longer than 3. *Prothorax* rather wider than head, and a little more than a third wider than long, sides with two setæ in front and one behind ; median line short but distinct, front transverse impression barely more than indicated, surface smooth, but with some vague longitudinal striation along front margin. *Elytra* about as wide as prothorax and a half longer than wide, border a little dilated at shoulder and sometimes forming a slight tooth, base granulate ; striæ impunctate, rather shallow on disk and behind, moderately deep at sides, inner ones reaching base and very nearly reaching apex ; inner intervals nearly flat, outer ones rather narrower and moderately convex, 3 with four setiferous pores. The microsculpture formed by isodiametric meshes, much finer on the head and prothorax than on the elytra, but sometimes indistinct on the head. *Venter* with some slight fine puncturation, the transverse sulci very distinct.

Length, 16·5–20 mm.

CEYLON (Brit. Mus., Deutsch Ent. Mus., coll. Bänninger, and my collection) — all without indication of precise locality.

The examples examined, though agreeing in most of their characters, showed variability in several directions. An example in the Colombo Museum from Bulutota has deeper and distinctly punctured striæ, with the shoulders very obviously dentate; nevertheless, it agrees so well with the typical form in other respects that I think it belongs to the same species. There are two examples from Mr. T. G. Sloane's collection; one of these is unusually smooth and shiny, the legs reddish, the base of the mandibles (which are very widely opened) is yellowish and translucent, the basal tooth in both mandibles very jagged; the second example, labelled "Bilihuloya (*I. Z. Kannegieter*)" is smaller than all the other specimens, the shoulders of the elytra are almost dentate, the intervals distinctly convex and the striæ finely punctate.

93. Coptolobus omodon, *Chaud.*

Coptolobus omodon, Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 161; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 71.

Colour black; palpi, antennæ, and tarsi more or less brown. *Head* with clypeal suture very indistinct, middle of front

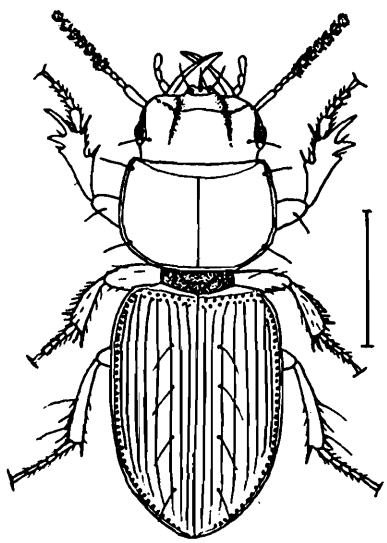


Fig. 36.—*Coptolobus omodon*, Chaud.

convex, with a depression on each side, frontal impressions very short, almost linear, diverging a little behind, sometimes with a few vague striæ behind at sides, mandibles with a carina on upper surface, eyes small, not longer than genæ, which are

evident and project as far as eye, antennæ slight, with joint 2 clearly longer than 3, surface smooth. *Prothorax* about a fourth wider than head and as much wider than long, sides with a seta in front close to the angle, and another at site of hind angle ; median line distinct, front transverse impression very slight, surface smooth. *Elytra* just wider than prothorax, hardly more than a half longer than wide ; shoulders dentate, base smooth apart from the transverse row of minute tubercles ; striæ impunctate, deep at sides, only moderately impressed on disk and at apex, the fine inner ones reaching base, none quite reaching apex ; intervals convex, the outer more so than the inner ones, 3 with four (sometimes five) setiferous pores. Microsculpture of upper surface formed by a reticulation of isodiametric meshes, clearly visible on elytra, but fainter and sometimes obsolete on head and prothorax. *Venter* with a little puncturation at sides of base, the segments transversely sulcate.

Length, 12·5–13·5 mm.

CEYLON : Hadley and Dikoya (*G. Lewis*—Brit. Mus.) ; Bulutota (Colombo Mus.).

Type in Mr. René Oberthür's collection.

94. **Coptolobus glabriculus**, *Chaud.* [Plate VI, fig. 4.]

Coptolobus glabriculus, Chaudoir, Bull. Mosc. 1857, ii, p. 60; Putzeys, Compt. rend. Soc. Ent. Belg. 1875, p. 45; Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1875, p. 162; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72.

Scarites obliterans, Walker, Ann. Mag. Nat. Hist. (3), ii, 1858, p. 203 ; Chaudoir, Mon. p. 162 (note) ; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 186.

Scarites subsignans, Walker, Ann. Mag. Nat. Hist. (3) ii, 1858, p. 203 ; Chaudoir, Mon. p. 162 (note) ; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 186.

Colour black ; palpi, antennæ, and tarsi piceous.

Head with clypeal suture barely visible, frontal impressions short and not deep, converging a little behind, mandibles with carina visible close to base only, eyes moderately prominent, a distinct notch between them and genæ, which are a little shorter but project as far laterally, antennæ with joint 2 barely longer than 3. *Prothorax* very little wider than head, about a third wider than long, base sometimes with a suggestion of being produced backwards at middle, sides with two setæ in front and one behind ; median line distinct though not deep, front transverse impression very shallow, surface smooth. *Elytra* slightly wider than prothorax, barely half as long again as wide, border thickened and forming a very distinct tooth at shoulder, base smooth, apart from the transverse row of minute tubercles, which do not extend on either side beyond the base of stria 4 ; striæ very faintly impressed and

only just visible, hardly reaching base and disappearing at a short distance from apex ; intervals flat, the outer narrower than the inner ones, 3 with four setiferous pores, surface very smooth and shiny. In spite of the polished surface there is sometimes a microsculpture of isodiametric meshes, visible at least on the elytra. *Venter* quite smooth, like the rest of the underside, the transverse sulci on the apical segments obsolete.

Length, 14–25 mm.

CEYLON : Colombo, Nuwara Eliya (*G. Lewis*—Brit. Mus. and *G. M. Henry*—Colombo Mus.), Horton Plains (*G. Lewis*—Brit. Mus. and *S. W Kemp*—Ind. Mus.), Bogawantalawa, Pattipola (*S. W Kemp*—Ind. Mus.), Pidurutalagalla (*G. M. Henry*) and Hakgala (Colombo Mus.), Peradeniya (*Uzel*—Vienna Mus.).

Type in Mr. René Oberthür's collection ; those of *obliterans* and *subsignans* in the British Museum.

95. **Coptolobus anodon**, *Chaud.*

Coptolobus anodon, Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 160.

Coptolobus taprobanæ, Chaudoir, Mon. p. 161 ; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72 ; Andrewes, Ann. Mag. Nat. Hist. (9) xiv, 1924, p. 587.

Colour black or piceous ; palpi, antennæ, and legs more or less piceous.

Head with clypeal suture just visible as a fine line, frontal impressions converging a little at extremities, a few longitudinal striæ on each side behind, mandibles with a carina on upper surface, eyes small, a little longer than genæ, which are only moderately conspicuous, antennæ with joint 2 hardly longer than 3. *Prothorax* about a third wider than head, but not much wider than long, with two lateral setæ in front, one being close to front angle, and one behind ; median line short and fine, but distinct, front transverse impression entire but shallow, surface smooth. *Elytra* a little wider than prothorax and about two-thirds longer than wide, shoulders without trace of tooth, the whole basal area granulate ; striæ impunctate, shallow on disk and behind, fairly deep at sides, the five inner ones reaching base, none quite reaching apex ; inner intervals rather flat, from 2 outwards becoming more convex and narrower, 3 with four (sometimes five) setigerous pores. Microsculpture of upper surface formed by a reticulation of extremely fine isodiametric meshes, more evident on the elytra than on the head and prothorax. *Sternum* : sides of metasternum and the metepisterna finely punctate. *Venter* finely punctate, the segments transversely sulcate.

Length, 14–18·5 mm.

CEYLON: Colombo (*G. Lewis*—Brit. Mus.), Boralesgamuwa (Colombo Mus.).

Types of both *anodon* and *taprobanæ* in Mr. René Oberthür's collection.

In the type of *anodon* there are one or two pores on the apical half of interval 5; this appears to be individual, as I have not seen similar pores on any other specimens.

Genus **GNAPHON**.

Gnaphon, Andrewes, Ann. Mag. Nat. Hist. (9) v, 1920, p. 454.
Anomoderus, Fairm. (not Chaud.), Bull. Soc. Ent. Fr. 1883, p. 55 (part).
Scaritoderus, Fairm., Bull. Soc. Ent. Fr. 1883, p. 55 (part).

TYPE, *Scaritoderus loyolæ*, Fairm. (South India.)

Form rather short and wide, body apterous. *Head* very large, quadrate, frontal impressions shallow, a deep longitudinal sulcus at sides; eyes very small and largely enclosed by the genæ, which are larger than and extend beyond eyes, separated from buccal fissure by a deep groove, in which the first joint of the antennæ is received, one supraorbital seta, far behind and far removed from eye; labrum small, emarginate, with three setigerous pores; mandibles stout, about as long as head, smooth, a median carina running from base to middle, each with an elongate, jagged tooth towards base and a smaller single one above it; ligula short, concave at apex, joined to tooth of mentum by a fine ridge, paraglossæ longer than ligula, projecting obliquely outwards, narrow at apex, meeting at base above ligula, densely fringed with hairs; mentum moderately emarginate, with a wide obtuse tooth, finely carinate along median line, lobes rounded, extending beyond epilobes, paragenæ dentate; buccal fissure extending beyond base of mentum, maxillæ straight, obtuse at apex, densely fringed with hairs on inner and apical margins, outer lobe jointed and longer than inner one; palpi stout, maxillaries glabrous, 4 obliquely truncate at apex, a little longer than 3, labials with 3 a little rounded at apex, slightly shorter than 2, which has half a dozen setæ on inner margin; antennæ moniliform, geniculate, pubescent from joint 5, not reaching base of prothorax, joint 1 at least as long as the next two joints taken together. *Prothorax* cyathiform, short and wide, with or without lateral setæ, the median part of base at least somewhat produced. *Elytra* short, rather flat on disk, shoulders dentate, side border after rounding shoulder continuing nearly to peduncle, epipleuræ very wide at base, narrowing rapidly at first, then gradually to apex; 8-striate (including marginal channel), scutellary striole wanting. *Sternum*: prosternal process unbordered; metepisterna very small, a little longer

than wide. *Venter* smooth, the segments bisetose, apical segment with two marginal setæ on each side. *Legs* stout, protibiæ wide, 3-digitate including apex, mesotibiæ with a spur just above apex; protarsi with joint 1 as long as next three taken together, shorter in two hind pairs of legs.

Range. South India.

The genus is closely allied to the New Caledonian genus *Anomophaenus* Fvl. (*Anomoderus* of Chaudoir's Monograph), and the type-species was included by Fairmaire in it. *Gnaphon* differs from it in its obtuse, carinate mental tooth, joint 2 of the labial palpi sex-setose, the antennæ short and thick, etc.

Key to the Species.

1 (4) Prothorax with its base only slightly produced at middle and with lateral setæ, elytra with intervals 3 and 5 costate.

2 (3) Head with frontal impressions extending back to level of eyes, prothorax with two lateral setæ on each side. Average length 19·5 mm. . . . . *costatus*, sp. nov., [p. 218.

3 (2) Head with frontal impressions extending back far beyond level of eyes, prothorax with three lateral setæ on each side. Length 38 mm. . . *humeralis*, Putz., [p. 219.

4 (1) Prothorax with its base strongly produced at middle and without lateral setæ, elytra with intervals 3 and 5 raised but not costate. Average length 24 mm. *loyolæ*, Fairm., p. 217.

96. **Gnaphon loyolæ**, *Fairm.* [Plate VI, fig 6.]

Scaritoderus loyolæ, Fairmaire, Bull. Soc. Ent. Fr. 1883, p. 55.
Crepidopterus favrei, Maindron, Bull. Soc. Ent. Fr. 1904, p. 264, fig.; Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 469.

Colour black, palpi piceous.

Head large, smooth, hardly narrower than prothorax, front angles rounded, clypeus very short and wide, bisetose, its front margin truncate, a short tooth projecting on each side of labrum, clypeal suture just visible as a very fine line, frontal impressions shallow, vaguely striate, widening in front, genæ large and extending well beyond eyes, antennæ with joint 1 as long as the next four taken together, 2 half as long again as 3, joints 5 to 11 a little longer than wide. *Prothorax* fully half as wide again as long, sides and base with a fairly thick border, sides of base oblique, median part produced and somewhat reflexed, the outer angles of the produced part forming a tooth on each side, apex widely emarginate, front angles only slightly rounded, sides without marginal setæ, gently

rounded to the dentate hind angles; median line short and fine, front transverse impression moderately deep, subcrenulate, entire, at some distance from front margin, hind transverse impression formed by two or three transverse striæ, basal foveæ obsolete, surface nearly smooth, front margin vaguely longitudinally striate, basal area granulate. *Elytra* rather flat, with very square shoulders, a little narrower than prothorax, about a half longer than wide, slightly dilated behind and widest at about middle, border thickened at shoulder, which is subdentate; striæ very vaguely impressed, with fine, nearly invisible, and not closely placed punctures, an uninterrupted series of minute umbilicate pores in marginal channel; even intervals nearly flat, 3 and 5 more convex, especially towards base, 7 forming a sharp elevated carina from shoulder, which it just rounds, to apex, the carina nearer to stria 6 than to stria 7, 8 narrow, its outer margin raised into an exceedingly fine carina from shoulder to apex, 3 with three (sometimes four) setiferous pores on apical half; surface closely granulate and consequently dull, intervals 3 and 5, where raised in front, more or less smooth and shiny.

Length, 19–30 mm.

MADRAS: Nilgiri Hills, Ootacamund (Brit. Mus.); Palni Hills, Kodaikanal (*Favre* and *Castets*), Neutral Saddle (*S. W. Kemp*—Ind. Mus.); Madura, Ramnad (*Fabre*), Shembaganur.

Type in Mr. René Oberthür's collection; that of *favrei* in Mr. Guy Babault's collection.

97 **Gnaphon costatus**, sp. nov. [Plate VI, fig. 5.]

About the same colour and shape as *G. loyolæ*, but a little smaller and differing otherwise in the following particulars:—

Head relatively a little narrower, genæ smaller and extending only just beyond the eyes, antennæ with joint 2 very slightly longer than 3, joints 5 to 11 slightly transverse. *Prothorax* not more than a third wider than long, median part of base only faintly produced and without angles at sides, apex equally widely but much less emarginate, so that the front angles are less evident, sides straighter, with two lateral setæ on each side, one near front angle, the other just behind hind angle, which is so obtuse as to be hardly apparent, front transverse impression deeper, hind one shallower, basal area less granulate. *Elytra* differing only in the nature of the intervals, the odd ones more shiny, costate in front and (except sutural interval) carinate near apex, 2 also somewhat raised close to apex, two setiferous pores near apex adjoining inner margin of stria 3, granulation of the surface similar, but disappearing on the shiny costæ.

Length, 18–21 mm.

MADRAS: Tinnevelly district, Netterikal region, Kalakkad Forest, 3000 to 5000 ft. (*E. Barnes*).

Type in the Indian Museum, Calcutta; a cotype (without abdomen) in my collection.

98. **Gnaphon humeralis**, *Putz.*

Haplogaster humeralis, Putzeys in Chaudoir's Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 151; Andrewes, Ann. Mag. Nat. Hist. (10) ii, 1928, p. 586.

"Length 38 mm., elytra 15 mm., width 10 mm.

"Black, shiny; elytra quite dull, except the three raised costæ. Head very wide, almost as wide as long, smooth furnished in the middle with two deep grooves, which converge a little behind and are prolonged far beyond the eyes; two narrower, but even deeper grooves border the eyes up to the supraorbital pore, and are separated from them by a slightly curved carina. The eyes are deeply sunk behind in the genæ, which project a little beyond them and extend to the base of the neck. The mandibles are strong, long, with the front half regularly curved; on the upper surface are two carinæ, one of which extends almost to the apex, while the other is directed obliquely to the large median tooth; on the inner margin of the mandibles are two triangular teeth, one just before the middle, the other at apical fourth, and between them another large irregular tooth.

"The prothorax is hardly wider than the head, very short, the sides with their front half a little curved, but not contracted before the angles, which form a projecting angle like a small tubercle; it contracts behind to the basal angles, which resemble the others, and are placed much further forward than in the majority of the other Scaritides; the base itself is semicircular, except that it is a little curved above the scutellum; the front angles are a little advanced, but not sharp; the lateral channel is deep; there is a third setiferous pore above the ordinary front pore. The front transverse impression is entire and very clearly marked, the median line, equally deep, does not extend beyond it; the hind transverse impression is less distinct; the whole base is rugose and shagreened.

"The elytra form a fairly short oval, with the base wide and obliquely truncate, in such a way that it rises up to the shoulders, which project and terminate in a large obtuse tooth; the greatest width is just below the shoulders; thence they contract a little up to the apex. The surface is flat. On each elytron there are three smooth, raised costæ; the 1st and 3rd join at the apex; the 3rd disappears at apical third. [There is an evident misprint either here, or above,

of 3rd for 2nd.]; between the first and the suture a small apical costa can be seen; the intervals between the costæ are very dull black; each of them contains two striæ, or rather two lines of fairly large punctures.

"The abdomen is smooth, except for some transverse undulations; each of the three preapical segments has at its base two large setiferous pores; the apical segment has two on each side. The metepisterna are a little longer than they are wide at the base, and they contract behind. The tooth of the mentum is carinate along the median line; square in front, it becomes narrower behind, so that the apex forms a large obtuse tooth. The first joint of the antennæ is at least twice as long as the next two, which are equal in length. The protibiæ have, above the outer terminal digitation, two long teeth followed by two denticulations. The mesotibiæ have each a single long spur.

"Lord Dormer has received two specimens from Madras. He has been good enough to allow me to keep one of them."

There is no example in the Putzeys collection at the Brussels Museum, but some years ago I saw one of the two specimens at Rennes, probably in the Chaudoir collection. I have placed the species under this genus with some hesitation, but my notes indicate that this is probably the right place for it, and the characters given in the description confirm this. As I have no specimen before me, I give a translation of the original.

Genus **HAPLOGASTER.**

Haplogaster, Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 149.

TYPE, *Haplogaster ovatus*, Chaud.

Body apterous. *Head* large, quadrate, clypeus bisetose, its front margin bidentate, frontal impressions short but deep, a very slight longitudinal sulcus above eyes, no neck constriction; eyes moderately prominent, enclosed by the genæ behind, separated from buccal fissure by a deep groove for the reception of joint 1 of antennæ, one supraorbital seta a little behind and removed from eye; labrum small, trilobed, each lobe with a pore and seta, median one a little more acute and further advanced than the lateral ones; mandibles stout, curved, shorter than head, deeply striate and with a median carina, each with a wide irregular tooth on basal half, and a smaller one above it; ligula short, concave, the blunt point at its apex beneath bent downwards and forming the termination of the carina on tooth of mentum, paraglossæ fairly wide, as long as ligula, densely fringed with hairs; mentum with a rather small emargination, which is more or less bordered, lobes gently rounded at sides, subtruncate at apex, tooth cari-

nate, broad at base, joining the truncated apex of ligula, epilobes forming small hollows at sides of tooth, paragenæ dentate; buccal fissure extending beyond base of mentum, maxillæ straight, obtuse at apex, densely fringed with hairs on inner and apical margins, outer lobe jointed and longer than inner one; palpi slender, maxillaries rounded at apex, joint 4 two-thirds longer than 3, labials rather pointed at apex, joint 3 a third shorter than 2, which is plurisetose; antennæ moniliform, geniculate, pubescent from joint 5, not reaching base of prothorax, 1 as long as the next three taken together, 2 a little longer and 4 a little shorter than the rest, which are about equal in length. *Prothorax* convex, base rounded and sometimes a little produced at middle, apex widely emarginate, front angles slightly rounded, inconspicuous, sides and base with a narrow reflexed border, hind transverse impression and basal foveæ obsolete. *Elytra* short, convex, ovate, with evident shoulders, which are sometimes dentate, base and marginal channel more or less granulate, base also finely tuberculate, border rounding shoulder and continued to peduncle, epipleuræ rather wide at base; 8-striate, including marginal channel, which has an uninterrupted row of umbilicate pores, no scutellary striole. *Sternum*: prosternal process sulcate, metasternal process bordered, metepisterna hardly longer than wide. *Venter* finely rugose-punctate, the segments bisetose, apical segment with two marginal setæ on each side. *Legs* stout; protibiæ wide, 3-dentate (including apex), mesotibiæ with a rather long spur just above apex; joint 1 in protarsi = 2+3, but shorter in the two hind pairs of legs.

Range. North-Eastern India and Burma.

Key to the Species.

1 (4)	Head with genæ not projecting laterally beyond eyes, hind angles of prothorax evidently dentate, length 21 to 27 mm.	
2 (3)	Head impunctate, base of prothorax smooth, elytra with interval 8 not carinate near apex	*ovata*, Chaud., p. 222.
3 (2)	Head finely punctate, base of prothorax granulate, elytra with interval 8 carinate near apex.	*wardi*, sp. nov., p. 223.
4 (1)	Head with genæ projecting laterally beyond eyes, hind angles of prothorax with tooth rudimentary or obsolete, average length 30 mm.	
5 (6)	Prothorax with base subrugose and granulate, elytral striæ evident, intervals on disk moderately convex	*ampliata*, Bates, p. 224.
6 (5)	Prothorax with base smooth, elytral striæ almost obliterated, intervals on basal two-thirds quite flat	*mollita*, Bates, p. 224.

99. **Haplogaster ovata**, *Chaud.*

Haplogaster ovatus, Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 150.

Colour black.

Head rather flat on disk, with front angles obliquely subtruncate, clypeus with some longitudinal striation at sides, clypeal suture fine but distinct at middle, frontal impressions deep, almost linear, reaching mid-eye level, converging a little behind, genæ evident, sloping rather gradually backwards, each one as long as eye and projecting nearly as far laterally, separated from it by a slight emargination, surface nearly smooth. *Prothorax* rather wider than head, and about a fourth

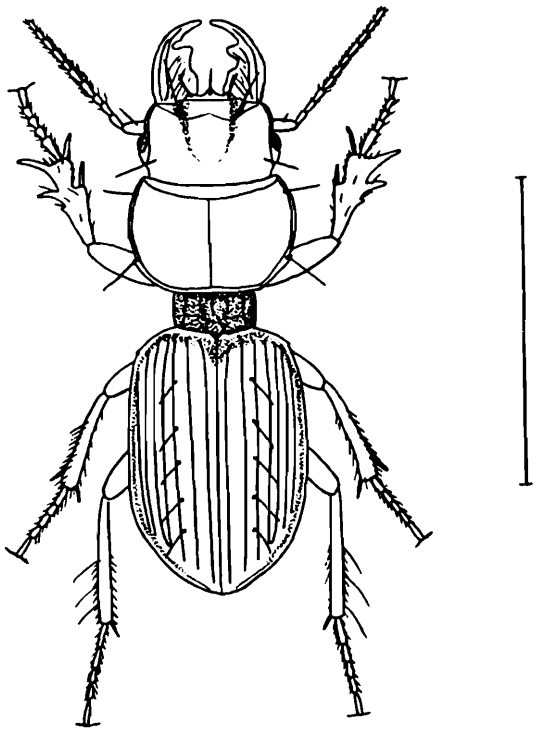


Fig. 37.—*Haplogaster ovata*, Chaud.

wider than long, base often slightly produced at middle, sometimes very distinctly, the border thickened and a vague transverse depression in front of it, sides with a seta in front (more rarely two) and another one close to hind angle, which is dentate ; median line and front transverse impression distinct, though not deep, surface with some vague striation, which is longitudinal along front margin. *Elytra* barely wider than prothorax, a little more than a half longer than wide, widest at middle, the thickened border at shoulder forming a small, though evident tooth ; striæ impunctate, fairly deep throughout, the five inner ones reaching base and nearly reaching apex, 6 and 7 generally shortened behind ; intervals flat or only moderately convex on disk, more convex at sides

and behind, 2 generally a little wider than the others near base and apex, 3 with from three to six setiferous pores adjoining stria 3, surface smooth but rather dull, the granulation of base extending also to marginal channel and, to some extent, to interval 8. Microsculpture formed by isodiametric meshes, finer on prothorax than on elytra, nearly invisible on head.

Length, 22–27 mm.

NEPAL: Khatmandu (*Manners-Smith*). ASSAM: Shillong (*S. W Kemp*, *F W Champion*, and *T. B. Fletcher*); Sylhet. SIKKIM: Pedong (*L. Durel*); Gopaldhara (*H. Stevens*); Darjiling (*A. Alcock* and *S. W Kemp*); Pashok (*F. H. Gravely*); Kurseong (*N. Annandale*). BENGAL: Siliguri. Two examples in the British Museum are labelled Allahabad, probably in error.

Type in Mr. René Oberthür's collection.

There is much variability in the individuals of this species, viz., in the degree to which the base of the prothorax is produced, in the number of punctures on interval 3, and in the form of the elytra at apex, where the intervals are sometimes nearly flat, sometimes subcostate, the whole apex occasionally irregularly sculptured and subrugose.

100. **Haplogaster wardi**, sp. nov.

Colour black.

A little smaller than *ovata*, but resembling it closely in general outline. *Head* with clypeus longitudinally striate, clypeal suture barely visible, frontal impressions moderately deep, longitudinally striate, eyes prominent, an acute re-entrant angle on each side in front of them, genæ conspicuous, a little shorter than eyes and not projecting so far, contracting sharply to neck, surface minutely punctate, except near front angles, finely strigose behind. *Prothorax* a little wider than head and about a fourth wider than long, base produced at middle, with a well-marked tooth on each side of the produced part and a similar one marking the hind angle, sides gently and evenly rounded, with a single seta in front, two at each hind angle; median line distinct, front transverse impression rather deep, no trace of basal foveæ, front margin longitudinally striate, surface vaguely transversely striate and also microscopically punctate, basal area finely granulate. *Elytra* hardly wider than prothorax, but nearly twice as long as wide, pointed at apex, the thickened border at shoulder forming an evident though obtuse tooth; striæ impunctate, rather deep, disappearing near apex, intervals moderately convex, 8 forming a well-marked carina from apical fourth to apex, 3 with three pores at a sixth, a half, and two-thirds, all adjoining stria 3, apical fourth somewhat flattened, finely rugose-asperate,

with an additional seta near apex on the site of interval 3, surface otherwise rather smooth and shiny, the granulation of base, which is very conspicuous, extending to marginal channel and most of interval 8. Microsculpture formed by a reticulation of isodiametric meshes, clearly visible on prothorax and elytra, obsolete on head.

Length, 21 mm.

BURMA: Seinghku, Wang, 5000 ft. (*F Kingdon Ward*).

Type in the British Museum. The type is a unique specimen.

101. **Haplogaster ampliata**, *Bates*.

Haplogaster ampliatus, Bates, Ann. Mus Civ. Gen. xxxii, 1892, p. 270.

Very closely allied to *ovata*, but on average considerably larger and relatively a little wider. Head rather smoother, but with some fine striæ above the eyes, the mandibles very coarsely striate, the genæ more evident and projecting laterally beyond the eyes. On the prothorax the tooth at hind angle is very small, the median line and front transverse impression are a little shallower, the basal area finely granulate, subrugose, and with a few transverse striæ, more noticeable at sides. Elytra rather more rounded at sides, the striæ shallow and indistinctly punctulate, the intervals nearly flat on disk and only moderately convex at sides, 3 with from two to four pores, adjoining stria 3.

Length, 26–33 mm.

BURMA: Kachin (*L. Fea*) (the "Catcin Cauri Mts." of Bates); Ruby Mines (*Doherty*—Brit. Mus.).

Type in the Genoa Civic Museum.

102. **Haplogaster mollita**, *Bates*.

Haplogaster ampliatus, Bates, var. *mollitus*, Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 270.

This form differs from the typical *ampliata* as much as that species does from *ovata*, and should take the same rank, unless both of them are to be treated as varieties. In size resembling *ampliata*, but differing as follows:—Head similar but smoother, with one or two striæ only on the clypeus. Prothorax rather longer, without any suggestion of being produced behind (as is usual in the other two species), the tooth at hind angle obsolete, the front transverse impression very faint, the surface smooth, even the basal area with only a little minute granulation at sides. Elytra a little shorter, the striæ on the basal two-thirds almost obliterated and the intervals consequently absolutely smooth, those at

apex slightly convex, the granulation of the surface similar at base, but less evident in the marginal channel.

BURMA: Karen Mountains (*L. Fea*—Genoa Mus., and *Doherty*—Brit. Mus.).

Type in the Genoa Civic Museum.

Genus SCARITES.

Scarites, Fabricius, Syst. Ent. 1775, p. 249; Dejean, Spec. Gen. i, 1825, p 364; Schmidt-Goebel, Faun. Col. Birm. 1846, p. 93; Lacordaire, Gen. Col. i, 1854, p. 194; Chaudoir, Bull. Mosc. 1855, i, p. 51; Motchulsky, Etudes Ent. 1857, p. 95; Chaudoir, Mon. des Scaritides (ii), Ann. Soc. Ent. Belg. 1880, p. Reitter, Best. Tab. eur. Col. xxxix, Scaritini, 1899, p. 4.

Tæniolobus, Chaudoir, Bull. Mosc 1855, i, p. 30; Motchulsky, Etudes Ent. 1857, p. 95; Chaudoir, Mon. p. 20.

Distichus, Motchulsky, Etudes Ent. 1857, p. 96; Chaudoir, Mon. p. 44.

Pleurogenius (= *Tæniolobus*), *Scallophorites*, *Harpalites*, *Broscomorphus*, *Parallelomorphus*, *Paramecomorphus*, Motchulsky, Etudes Ent. 1857, pp. 95-96.

TYPE, *Scarites subterraneus*, F. (N. America.)

Colour black, legs with some stiff reddish pubescence. Form elongate, moderately convex, body either winged or apterous, glabrous, surface usually shiny, sometimes dull, the elytra often with a microsculpture formed by a reticulation of isodiametric meshes, which rarely extends to prothorax and head, the apex of the elytra sometimes subrugose.

Head wide, quadrate, front angles obliquely truncate ("lateral truncature"), the hind angle of the truncature ("preocular angle") more or less rounded, bordered, and often projecting laterally; two longitudinal frontal impressions, always more or less striate; neck not usually constricted, though there are often traces of constriction at sides; eyes only moderately prominent, or even flat, very indistinctly faceted, more or less enclosed behind by the genæ, which are often prominent, widely separated from buccal fissure, with one supraorbital seta, sometimes with a rounded or elongate depression behind the inner margin; labrum short, trilobed, each lobe bearing a large pore, median lobe with two setæ (occasionally the pore is divided into two), either equal to, or longer than the lateral lobes, which are unisetose and densely ciliate on outer margin; clypeus strongly transverse, usually bisetose, the clypeal suture lightly impressed, often obsolete at middle, the median part slightly emarginate and with a small tooth at each extremity, usually with two other slight prominences in the middle of the emargination; mandibles large and strong, generally quite as long as head, the upper edge of the scrobe cariniform, a median carina on upper surface, both

mandibles usually bidentate, left one with a very large basal tooth and a smaller tooth in front, right one with two approximately equal teeth, the front tooth bearing a carina of variable position, but normally joining the median carina at some distance from base (rarely obsolete or wanting); ligula normally hidden, short and wide, adherent to tooth of mentum, produced at sides, paraglossæ extending considerably beyond ligula, the whole very hispid; mentum moderately emarginate, with a tooth in the emargination, which is carinate and usually about as long as lobes, the surface subgranulate or striate, the middle of base bifoveate, lobes bordered or with a carina at sides, and often truncate at apex; paragenæ flattened and truncate at apex, inner margin variable in form, but usually with a sharp tooth and an emargination just outside or above it; buccal fissure extending beyond base of mentum, maxillæ with a short sharp hook at apex, densely ciliate within, and also at apex, on the upper margin, outer lobe jointed; palpi slender, glabrous, more or less rounded at apex, maxillaries with joint 4 generally a little longer than 3, labials with joint 2 longer than 3 and inwardly plurisetose; antennæ usually moniliform, more rarely filiform, pubescent from (and including) joint 5, joint 1 scapiform, as long, or nearly as long, as the next four joints taken together, lying, when recurved, in a groove between genæ and paragenæ, joints 5 to 10 flattened and, viewed at right angles to the widest face, varying somewhat in their proportions.

Prothorax usually transverse, with parallel or slightly rounded sides, often a little contracted behind, base bordered, sometimes arcuate, but frequently with straight oblique sides, the median part sometimes more or less produced, apex widely emarginate, front angles fairly sharp, occasionally advanced, hind angles dentate (Indian species), sides rather narrowly bordered, lateral setæ up to 2 (rarely more) on each side present or absent (front pore, when present placed not far behind front angles, hind one just behind tooth); median line generally fine, the sulcus running parallel with front margin ("front transverse impression") often deep at sides, usually shallower at middle, basal foveæ obsolete or nearly so, their site nearly always granulate.

Elytra hardly wider than prothorax, and approximately twice as long as wide, slightly ovate or with parallel sides, base always more or less granulate, moderately emarginate at middle over a space covered roughly by the four inner intervals on each side, sides of base either straight or curved, but nearly always sloping back to shoulders, which are dentate; 7-striate, the striæ smooth or punctate, nearly, but not quite, reaching apex, usually moderately deep, sometimes obsolete,

rarely wanting, no scutellary striole, the marginal channel, with a large part of interval 8, granulate (Indian species); intervals generally somewhat convex, 3 with a variable number of setiferous pores, all adjoining stria 3, rarely without pore (a single pore is always placed close to apex, when there are two pores the second is at apical third, when there are three the third is at basal fourth, and a fourth pore is placed just behind middle), 8 wider than the other intervals.

Sternum: episterna and sides of sterna generally subgranulate, prosternal process sometimes sulcate, metasternum sometimes with two or more setiferous pores placed behind the meso-coxæ, metasternal process usually finely bordered, metepisterna of variable length. *Venter* nearly always finely rugose at sides, the segments bisetose, apical segment with two marginal setæ on each side in both sexes, last three segments sometimes transversely sulcate. *Legs* stout and adapted for digging, metacoxæ contiguous, profemora wide, protibiæ produced outwards at apex into a long spiniform process, longer than apical spur, with two teeth above it, and from 1 to 8 denticulations above the teeth, mesotibiæ with one or two stout spurs near apex, metatibiæ with from 4 to 20 long setæ in the outer sulcus, in addition to the rows of short spines, claws smooth.

Range. Almost world-wide in the warmer temperate and in tropical regions, excluding Australia and New Zealand.

The favourite habitat of the species forming this genus is a sandy oceanic littoral, or moist, salt, sandy ground inland. The insects are said to form deep burrows, to which they retire by day, emerging as a rule only at night; practically nothing has been recorded of the habits of the Indian species.

The larvæ of two palæarctic species have been described, viz., that of *S. lævigatus*, F. (Schiødte, Nat. Tidsskr., 1867, pp. 497–500, t. 18, ff. 10–16) and that of *S. terricola*, Bon. = *arenarius*, Bon. (Mulsant et Mayet, Mém. Acad. Sci. Lyon, 1872, t. 19, pp. 325–9); Mr. T. B. Fletcher has published figures of the pupa and some observations on the larva of *S. indus*, Oliv. (see under that species).

Chaudoir seems first to have called attention to the ferruginous spots sometimes to be seen on the sides of the last two ventral segments; he adds in a footnote: "These yellow spots are probably phosphorescent and luminous at night, but this has never been verified." So far as I am aware nothing further regarding them has been recorded.

Key to the Species.

1 (78) Last three ventral segments not transversely sulcate, metasternum without setiferous pores behind mesocoxæ.

2 (71) Metepisterna about twice as long as wide, sides of body usually parallel, body winged.

3 (62) Mesotibiæ with two spurs on outer margin towards apex.

4 (7) Elytra with a single pore close to apex on interval 3, prothorax without marginal setæ (but see *boucardi*).

5 (6) Prothorax with front angles rounded, elytra less than twice as long as wide, slightly dilated behind, the striæ smooth, average length 35 mm. *eurytus*, Fisch., p. 235.

6 (5) Prothorax with front angles produced, dentate, elytra more than twice as long as wide, the sides parallel, the striæ punctate, average length 25 mm.. . . *cylindronotus*, Fald., [p. 238.

7 (4) Elytra with more than a single pore on interval 3, prothorax with at least a seta at each hind angle.

8 (17) Elytra with two or three pores on apical half on interval 3 (but see *boucardi*).

9 (14) Prothorax without marginal setæ in front, elytra not sulcate, two pores on interval 3, length rarely over 28 mm.

10 (11) Prothorax with median part of base produced, sides of outer elytral intervals granulate behind shoulders. *salinus*, Dej., p. 239.

11 (10) Prothorax with median part of base not produced, sides of outer elytral intervals not granulate behind shoulders.

12 (13) Elytra with the striæ impunctate, shallow, but impressed on disk, surface shiny in front, shagreened on apical fourth . . . . . *semirugosus*, Chaud., [p. 240.

13 (12) Elytra with the striæ very finely punctate, hardly impressed on disk, surface shagreened throughout. *ceylonicus*, Chaud., [p. 241.

14 (9) Prothorax with a marginal seta on each side in front, elytra sulcate, three pores on interval 3, length rarely under 30 mm.

15 (16) Elytra with the striæ coarsely punctate or even foveolate . *sulcatus*, Oliv., p. 242.

16 (15) Elytra with the striæ finely rugose, impunctate *dyschromus*, Chaud., [p. 243.

17 (8) Elytra with interval 3 seriate-punctate, one of the pores near base, prothorax with two marginal setæ on each side.

18 (59) Paragenæ inwardly dentate and with a deep emargination outside the tooth, metatibiæ with four to six long setæ in the external sulcus. Species of moderate size, nearly always under 40 mm. in length.

19 (30) Prothorax with median part of base evidently produced.

20 (29) Elytra with four or five pores on interval 3, the two spurs on mesotibiæ about equal in length, length at least 20 mm.

21 (28) Sides of prothorax rounded, elytra slightly dilated behind, mandibles not produced externally at base.

22 (25) Head massive, almost as wide as prothorax, genæ conspicuous.

23 (24) Head with genæ projecting beyond eyes, median carina of mandibles gently sinuate, elytral surface shiny in front, shagreened behind, the intervals conspicuously granulate along margins, average length 37 mm... . . *tauropus*, sp. nov., [p. 244.

24 (23) Head with genæ not projecting as far as eyes, median carina of mandibles strongly sinuate, elytral surface uniform, rather dull, the intervals without granulation, at least on disk, average length 29·5 mm. .. .. *pinguis*, sp. nov., p. 245.

25 (22) Head of moderate size, a fifth narrower than prothorax, genæ inconspicuous.

26 (27) Prothorax with front angles produced on each side into a sharp tooth, elytra less than twice as long as wide, the surface minutely rugose, average length 29 mm. . .... *dentatus*, sp. nov., [p. 246.

27 (26) Prothorax with front angles faintly dentate, elytra twice as long as wide, the surface nearly smooth, average length 22·5 mm. .... *bengalensis*, Dej., [p. 247.

28 (21) Sides of prothorax nearly straight, sides of elytra parallel, mandibles produced externally at base into a rounded tooth . ... *stenodes*, sp. nov., [p. 248.

29 (20) Elytra with three pores on interval 3, one in front and two behind, the upper spur on mesotibiæ shorter than the subapical one, average length 15 mm.. *semicircularis*, Macl., [p. 249.

30 (19) Prothorax with median part of base not, or only very faintly produced.

31 (34) Head with an oblique sulcus on each side behind eye, mentum with its sides widely bordered at base, the inner margin of the border subcarinate, protibiæ with five to seven denticulations above the teeth.

32 (33) Head moderately striate and almost impunctate, the oblique sulcus on each side behind eye very deep. *selene*, Schm.-Goeb., [p. 250.

33 (32) Head finely and densely striate-punctate, the oblique sulcus on each side behind eye moderately deep . . . . . *barbarus*, Dej., p. 252.

34 (31) Head without an oblique sulcus on each side behind eye, mentum slightly and generally narrowly bordered at sides.

35 (58) Antennæ more or less moniliform, elytra with impressed impunctate striæ, four or five pores on interval 3.

36 (55) Mandibles normal, left one with a large basal tooth, often bifid and frequently with a second small one towards apex, right one with two teeth.

37 (50) Prothorax transverse, at least a fifth wider than long.

38 (41) Mandibles with the central carina gently curved, not or only faintly sinuate, prothorax with front transverse impression shallow or obsolete at middle.

39 (40) Head moderately striate, impunctate, front transverse impression obsolete at middle (except where it joins median line), impunctate, average length 28 mm. . . . . *dubiosus*, sp. nov., p. 261.

40 (39) Head finely and closely punctate-striate, front transverse impression not obsolete at middle, finely crenulate, average length 22 mm. . *corbetti*, sp. nov., [p. 252.

41 (38) Mandibles with the central carina evidently sinuate, prothorax with front transverse impression deep throughout.

42 (43) Head with joints 5 to 10 of the antennæ transverse, elytral intervals very convex, even on disk, and without granulation along margins average length 19·5 mm. . . . . *inconspicuus*, Chaud., [p. 253.

43 (42) Head with joints 5 to 10 of the antennæ longer than wide, elytral intervals only moderately convex, granulate along margins.

44 (49) Head moderately and rather coarsely striate.

45 (48) Genæ less prominent than eyes, without an evident emargination between them when viewed from above, prothorax with somewhat rounded sides.

46 (47) Eyes rather flat, genæ moderately conspicuous, joints 5 to 10 of antennæ a half longer than wide, average length 28 mm. .. *derogatus*, sp. nov., [p. 254.

47 (46) Eyes moderately convex, genæ quite inconspicuous, joints 5 to 10 of antennæ less than a half longer than wide, average length 24 mm. *prædator*, Chaud. [p. 256.

48 (45) Genæ as prominent as eyes, with a distinct emargination between them when viewed from above, sides of prothorax very nearly straight *retusus*, sp. nov., p. 255.

49 (44) Head finely and densely striate . *granulatus*, sp. nov., [p. 256.

50 (37) Prothorax at least as long as wide.

51 (54) Eyes moderately prominent, elytra twice as long as wide, interval 3 with four pores.

52 (53) Head rather closely and conspicuously striate, mandibles with the central carina sinuate, genæ inconspicuous, prothorax with the front transverse impression shallow, length 22 mm. *fletcheri*, sp. nov., [p. 257.

53 (52) Head faintly striate, central carina sinuate in right mandible only, genæ conspicuous, contracted sharply to neck, prothorax with the front transverse impression deep, length 17 mm. *batesi*, sp. nov., p. 258.

54 (51) Eyes very flat, elytra more than twice as long as wide, interval 3 with five pores ..... . *cormoides*, sp. nov., [p. 259.

55 (36) Mandibles abnormal, left one subconstricted at middle, right one with a single vertically bifid tooth, front transverse impression obsolete or very shallow at middle.

56 (57) Left mandible with a wide, slightly jagged tooth at base, and a well-developed tooth at a third from apex, central carina in both mandibles strongly raised at base, average length 31 mm. ... .. . *mandibularis*, sp. nov., [p. 260.

57 (56) Left mandible with a wide basal tooth, bearing a rounded knob, and another small tooth just in front of middle, central carina slightly raised at base, length 22 mm. . .. ... *scævus*, sp. nov., p. 261.

58 (35) Antennæ filiform, elytral striæ hardly impressed, vaguely punctate, three pores on interval 3, one of which is on basal half, length over 30 mm. *liopterus*, Chaud., p. 262.

59 (18) Paragenæ inwardly without emargination and with only a rudimentary tooth. Large species, nearly always over 40 mm. in length.

60 (61) Antennæ moniliform, genæ projecting beyond eyes, elytral striæ only just visible, metatibiæ with about a dozen long setæ in the external sulcus, length about 50 mm. . . *boucardi*, Chaud., [p. 264.

61 (60) Antennæ filiform, genæ not projecting beyond eyes, elytral striæ moderately deep, metatibiæ with about half a dozen long setæ in the external sulcus, length about 40 mm. . . . . *orthomus*, Chaud., [p. 266.

62 (3) Mesotibiæ with a single spur on outer margin close to apex.

63 64) Elytra with two pores on interval 3 near apex. . . . . *terricola*, Bon., p. 267.

64 (63) Elytra with three pores on interval 3, one near base and two near apex (occasionally with a fourth pore just behind middle).

65 (68) Head rather lightly and not closely striate, sometimes punctate at sides behind, surface generally shiny.

66 (67) Mandibles striate between scrobe and median carina, elytra less than twice as long as wide, slightly, though evidently, dilated behind, protibiæ with two to four denticulations above upper tooth, length not less than 16 mm. . . . . *indus*, Oliv., p. 269.

67 (66) Mandibles smooth between scrobe and median carina, elytra twice as long as wide, sides nearly parallel, protibiæ with two denticulations above upper tooth, length not exceeding 14 mm. . . *subnitens*, Chaud., [p. 271.

68 (65) Head finely, closely, and irregularly striate, densely punctate behind.

69 (70) Surface shiny, elytral striæ fairly deep, protibiæ with two denticulations above upper tooth . . . . . *subcylindricus*, Chaud., [p. 269.

70 (69) Surface dull, elytral striæ hardly impressed, protibiæ with one denticulation above upper tooth . . . . . *punctum*, Wied., [p. 272.

71 (2) Metepisterna a half to two-thirds longer than wide, prothorax with a seta at each hind angle, elytra evidently dilated behind, metatibiæ with two spurs, body apterous.

72 (75) Elytra with interval 3 normally impunctate, protibiæ with four or five denticulations above upper tooth, metatibiæ with four to six long setæ in the external sulcus.

73 (74) Prothorax produced at middle of base, a seta on each side at hind angles only, elytra with interval 7 not carinate at base, intervals 6 to 8 not overhanging the border near shoulder . . . . . *guineensis*, Dej., p. 274.

74 (73) Prothorax not produced at middle of base, its sides bisetose, elytra with interval 7 carinate at base, intervals 6 to 8 overhanging the border near shoulder . . . . . *cycloderus*, Chaud., [p. 275.

75 (72) Elytra with at least one pore on interval 3, protibiæ with six to eight denticulations above upper tooth.

76 (77) Head smooth, except in frontal impressions and on clypeus, prothorax with a seta on each side at hind angles only, elytra with a single pore on interval 3 close to apex, external sulcus of metatibiæ rather densely fringed with long setæ, average length 40 mm. . . *nitens*, sp. nov., p. 276.

77 (76) Head very finely and densely rugose-punctate, sides of prothorax bisetose, elytra with four pores on interval 3, external sulcus of metatibiæ with about four long setæ, length 26 mm. . . . . *crassus*, sp. nov., p. 278.

78 (1) Last three ventral segments transversely sulcate, mentum with a fine longitudinal carina on each side, a little removed from margin, and another on the tooth, metasternum with some setiferous pores behind the mesocoxæ.

79 (96) Metepisterna about twice as long as wide, metasternum with two setiferous pores behind the mesocoxæ, sides of body nearly parallel, body winged (*Distichus*).

80 (93) Elytra shiny, with a microsculpture (if present) visible chiefly near apex, the striæ at least moderately deep.

81 (90) Head with middle of front and vertex smooth, the emargination in clypeus with two minute teeth at middle.

82 (89) Prothorax with its sides bisetose, one seta a little behind the front angle, another at hind angle.

83 (86) Form depressed, head densely punctate behind, length at least 10 mm.

84 (85) Neck coarsely punctate, elytra with the striæ moderately deep, but shallow at apex, average length 15 mm. *planus*, Bon., p. 279.

85 (84) Neck finely punctate, elytra with the striæ very deep up to apex, average length 11 mm.. [p. 281. *mahratta*, sp. nov.,

86 (83) Form moderately convex, head lightly punctate.

87 (88) Eyes moderately convex, genæ inconspicuous, prothorax a fifth wider than long, middle of base not produced, length rarely over 10 mm.. *picicornis*, Dej., p. 282.

88 (87) Eyes flat, genæ evident, as prominent as eyes, prothorax a fourth wider than long, middle of base slightly produced, average length 13 mm.. *laticeps*, sp. nov., [p. 283.

89 (82) Prothorax with three to five setæ on each side along the marginal channel . . . . *parvus*, Wied., p. 283.

90 (81) Head with at least some fine striæ or rugæ on middle of front or vertex, the emargination in clypeus edentate.

91 (92) Head densely longitudinally striate, prothorax with front angles inconspicuous, the hind angles and the shoulders of elytra minutely dentate. *striaticeps*, Chaud., [p. 284.

92 (91) Head with half a dozen longitudinal carinæ on each side, prothorax with the front angles produced and sharp, hind angles and the shoulders of elytra conspicuously dentate *rectifrons*, Bates, [p. 286.

93 (80) Elytra dull, with microsculpture covering the whole surface, striæ shallow and finely punctate.

94 (95) Head with frontal impressions finely and densely striate, neck finely and closely punctate, prothorax generally punctate within the front angles *puncticollis*, Chaud., [p. 287.

95 (94) Head with frontal impressions deep, linear, diverging behind, only one or two striæ at sides, neck lightly punctate, prothorax impunctate within front angles. . . . *uncinatus*, Andr., [p. 288.

9 (79) Metepisterna about half as long again as wide, metasternum with more than two setiferous pores behind the mesocoxæ (but see *modestus*), body apterous (*Tæniolobus*).

97(100) Elytra with intervals on disk nearly flat, 3 with three or four pores, length not exceeding 14 mm.

98 (99) Head lightly striate, shoulders of elytra only slightly dentate, length 9·5 mm. . . . . *modestus*, Chaud., [p. 289.

99 (98) Head closely striate, shoulders of elytra conspicuously and sharply dentate, length 14 mm. . . . . *beesoni*, sp. nov., p. 290.

100 (97) Elytra with intervals on disk convex, 3 with five pores, average length 15·5 mm. . . *birmanicus*, Bates, [p. 291.

103. Scarites eurytus, *Fisch.* [Fig. 39 (22).]

Scarites eurytus, Fischer, Ent. Russ. iii, 1828, p. 119, t. v. f. 3; Motchulsky, Käf. Russ. 1850, p. 19; Chaudoir, Bull. Mosc. 1855, i, p. 74; Motchulsky, Etudes Ent. 1857, p. 96; Solsky in Fedchenko's Turkestan, ii, part 5, 1874, p. 53; Chaudoir, Mon. p. 70; Bedel Cat. rais. Col. N. Afr. 1895, p. 41; Reitter, Best. Tab. p. 4; Andrewes, Ent. Mitt. 1927, p. 143.
Scarites bucerdo, Ménétriés, Cat. rais. Cauc. 1832, p. 102.
Scarites exasperatus, Klug * in Symb. Phys. Decas iii, 1832, t. xxiii. f. 4; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 100.
Scarites lætus, Faldermann *, Bull. Mosc. 1836, p. 361, t. vi. f. 5.
Scarites oblongus, Chaudoir *, Bull. Mosc. 1843, ii, p. 725.
Scarites chaudoiri, Ballion, Bull. Mosc. 1870, i, p. 326.

Head with lateral truncature on each side slightly emarginate, preocular angle conspicuous and projecting a little laterally, frontal impressions shallow, the whole area, except neck, covered by a moderate striation, very variable in its density, neck with a few punctures, chiefly at sides; mandibles nearly as long as head, striate, obliquely above, longitudinally beneath, median carina sinuate at about a third from base, left mandible with a wide basal tooth and another small one towards apex, right one with two teeth, the basal one slightly bifid; eyes rather flat, genæ small but projecting laterally a little further than eyes; antennæ moniliform, joints 5 to 10 barely a half longer than wide; mentum granulate, its sides narrowly bordered. *Prothorax* a fifth wider than head and not quite a half wider than long, base a little produced at middle, the produced part emarginate, sides of base nearly straight, front angles somewhat rounded, sides gently rounded, without lateral setæ, hind angle marked by a small tooth; median line and front transverse impression clearly marked, latter deepening towards front angles, basal foveæ just indicated, granulate, the granulation extending to basal channel. *Elytra* with parallel sides, as wide as prothorax and nearly twice as long as wide, the sides of base curved and ending in a small, sharp tooth at shoulder; striæ impunctate, moderately deep, deeper at sides; intervals moderately convex, granulate at sides, a single pore at extremity of stria 2; surface smooth, but shagreened towards apex, without microsculpture. *Sternum*: pro- and metepisterna slightly granulate, latter more than twice as long as wide. *Legs*: protibiæ with half a dozen denticulations above upper tooth; mesotibiæ with two spurs.

Length, 30–42 mm.

BALUCHISTAN: Nushki district (*E. Vredenburg*—Ind. Mus.); Seistan (*A. H. McMahon*—Ind. Mus.). AFGHANISTAN. TRANSCASPIA. PERSIA. IRAK. ASIA MINOR. SYRIA. NORTH AFRICA. SUDAN.



Fig. 38.—Mandibles of Indian species of *Scarites*.

1. *S. scævus*, Andr.
2. *S. liopterus*, Chaud.
3. *S. batesi*, Andr.
4. *S. guineensis*, Dej.
5. *S. cormoides*, Andr.
6. *S. tauropus*, Andr.
7. *S. punctum*, Wied.
8. *S. boucardi*, Chaud. (forma major).
9. *S. boucardi*, Chaud. (forma minor).
10. *S. fletcheri*, Andr.
11. *S. dubiosus*, Andr.

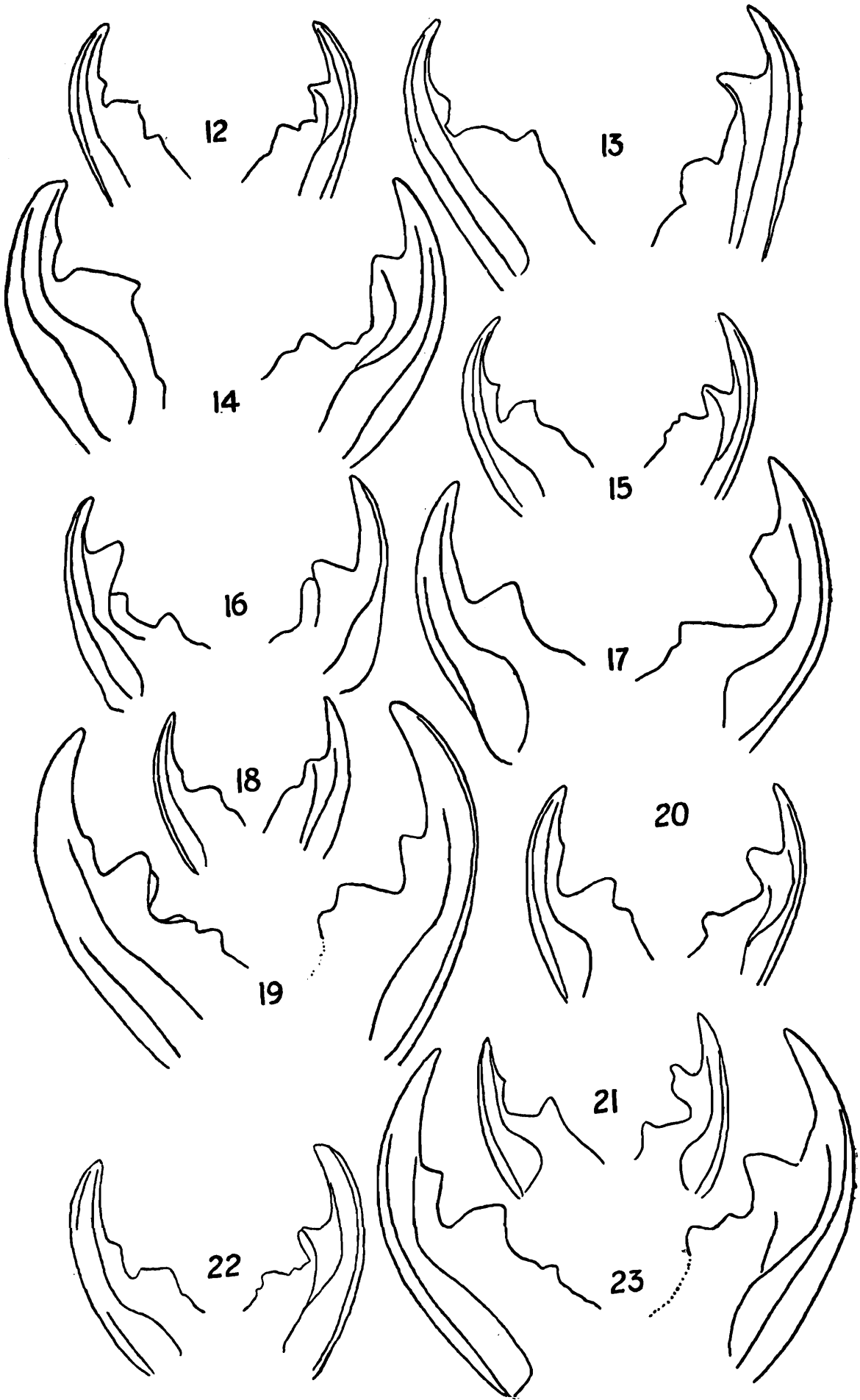


Fig. 39.—Mandibles of Indian species of *Scarites*.

12. *S. semirugosus*, Chaud.
13. *S. selene*, Schm.-Goeb.
14. *S. nitens*, Andr.
15. *S. derogatus*, Andr.
16. *S. mandibularis*, Andr.
17. *S. cycloderus*, Chaud.
18. *S. crassus*, Andr.
19. *S. sulcatus*, Oliv.
20. *S. pinguis*, Andr.
21. *S. stenodes*, Andr.
22. *S. eurytus*, Fisch.
23. *S. orthomus*, Chaud.

Type not traced, that of *bucerdo* in the Petrograd Museum, that of *exasperatus* in the Berlin Zoological Museum, those of *lætus* and *oblongus* in Mr. René Oberthür's collection, that of *chaudoiri* presumably in the Odessa University Museum.

Reitter, in his Bestimmungs-Tabelle of the genus *Scarites* (p. 4, note (i)) gives his reasons for treating *procerus*, Dejean (Spec. Gen. i, 1925, p. 372), from Egypt and the Sudan, as a synonym of *eurytus*. I have not seen either of the types, and hesitate to express any opinion, but Chaudoir certainly regarded the two species as distinct, and they are so treated in the latest catalogue of palæarctic species.

104. **Scarites cylindronotus**, *Fald.*

Scarites cylindronotus, Faldermann*, Bull. Mosc. 1836, p. 363, t. vi. f. 4; Motchulsky, Käf. Russ. 1850, p. 19; Chaudoir, Bull. Mosc. 1855, i, p. 69; Motchulsky, Etudes Ent. 1857, p. 96; Solsky in Fedchenko's, Turkestan, ii, part 5, 1874, p. 54, t. i. f. 5; Chaudoir, Mon. p. 71; Reitter, Best. Tab. p. 5.

Head with the lateral truncature on each side rather deeply emarginate, preocular angle evident, but rounded, and hardly projecting laterally, frontal impressions shallow, the whole area covered by fine shallow striæ, chiefly longitudinal, a little deeper above eye, without any puncturation; mandibles finely striate, the median carina moderately sinuate, lower tooth in right mandible slightly bifid; eyes flat, genæ inconspicuous from above, but actually with two projections, one above the other, separated by a short groove; labrum with its median lobe emarginate; antennæ moniliform, not quite reaching hind angles of prothorax, joints 5 to 10 as wide as long; mentum subrugose, widely bordered at sides. *Prothorax* slightly wider than head and also slightly wider than long, base produced at middle, its sides straight, front angles projecting forward on each side as a small, fairly sharp tooth, sides nearly straight, without lateral setæ, hind angles marked by a strong tooth; median line and front transverse impression rather fine, the latter finely crenulate and deeper close to front angles, basal foveæ moderately deep, with only traces of granulation. *Elytra* with the sides parallel and appearing crenulate from above, as wide as prothorax and rather more than twice as long as wide, base with its median emargination very wide, and with short sides, curving slightly to the shoulders, which are feebly dentate; striæ moderately impressed and crenulate on disk, deep and coarsely punctate at sides; intervals rather flat on disk, more convex at sides, especially in front, without granulation along margins, 7 subcostate and rugose at base, a single large pore on 3 close to apex, marginal channel very coarsely granulate, surface

nearly smooth, faintly shagreened, and with some traces of microsculpture near apex. *Sternum*: sterna smooth, metepisterna more than twice as long as wide. *Legs*: protibiæ with two denticulations above upper tooth; mesotibiæ with two spurs; metatibiæ with a fringe of about a dozen long setæ.

Length, 23–28 mm.

BALUCHISTAN: Seistan (*A. H. McMahon*—Ind. Mus.). TRANSCASPIA. TURKESTAN.

Type in Mr. René Oberthür's collection.

105. **Scarites salinus**, *Dej.*

Scarites salinus, Dejean *, Spec. Gen. i, 1825, p. 385; Fischer, Ent. Russ. iii, 1828, p. 120; Dejean et Boisduval, Icon. et Hist. Nat. i, 1830, t. xxi, f. 2; Ménétriés, Cat. rais. Cauc. 1832, p. 102; Motchulsky, Käf. Russ. 1850, p. 19; Chaudoir, Bull. Mosc. 1855, i, p. 72; Solsky in Fedchenko's Turkestan, ii, part 5, 1874, p. 55; Chaudoir, Mon. p. 78; Reitter, Best. Tab. p. 5.

Scarites sabuleti, Fischer, Ent. Russ. iii, 1828, p. 121, t. v. f. 2.

?*Scarites fischeri*, Zubkoff, Bull. Mosc. 1833, p. 315; Solsky in Fedchenko's Turkestan, ii, part 5, 1874, p. 54.

Scarites crenulatus, Chaudoir *, Bull. Mosc. 1842, ii, p. 811.

Head with the lateral truncature on each side straight, preocular angle rounded and not projecting laterally, frontal impressions shallow, their outer sides and clypeus moderately striate, surface elsewhere nearly smooth; mandibles obliquely striate, the median carina moderately sinuate, right mandible with the basal tooth thick, but hardly bifid; eyes rather flat, genæ not projecting laterally beyond eyes, and sloping gently backwards; antennæ moniliform, hardly reaching hind angles of prothorax, joints 5 to 10 not much longer than wide; mentum rugose-striate, narrowly bordered at sides. *Prothorax* a little wider than head and a fifth wider than long, base evidently produced at middle, the produced part with a thick border, in front of which, and of the basal channel, is a transverse depression, front angles not produced, but not much rounded, sides nearly straight at middle, rounded close to front angles and behind, where the sides of base continue the curve, hind angles marked by a very small tooth and a pore and seta; median line and middle of front transverse impression fine, latter much deeper and crenulate at sides, basal foveæ distinct, granulate. *Elytra* slightly dilated behind as wide as prothorax and very nearly twice as long as wide, sides of base curving gently backwards to shoulders, which are slightly dentate; striæ vaguely crenulate, moderately deep, deeper at sides; intervals rather flat on disk and behind, convex behind shoulders, where the crenulation is replaced by granulation, inner edge of 8 raised into a carina behind shoulder,

3 with two pores near apex; surface smooth, faintly shagreened, and with traces of microsculpture close to apex. *Sternum*: sterna nearly smooth, metepisterna twice as long as wide. *Legs*: protibiæ with two or three denticulations above upper tooth; mesotibiæ with two spurs.

Length, 25–31 mm.

BALUCHISTAN: Nushki district (*E. Vredenburg*—Ind. Mus.). PERSIA. TURKESTAN. TRANSCASPIA. TRANSCAUCASIA. SYRIA. SOUTH RUSSIA.

Type, as also those of *sabuleti* and *crenulatus*, in Mr. René Oberthür's collection, that of *fischeri* not traced.

Reitter (Best. Tab. p. 5) adds, as a further synonym, *S. impressicollis*, Zubkoff (Bull. Mosc. 1837, v, p. 60, t. 3. f. 2), but this requires confirmation.

106. **Scarites semirugosus**, *Chaud.* [Fig. 39 (12).]

Scarites semirugosus, Chaudoir*, Bull. Mosc. 1855, i, p. 90; id., Mon. p. 82; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 272; Lesne, Miss. Pavie Hist. Nat. 1904, p. 63; Vuillet, Insecta, ii, 1912, p. 17.

Scarites rugipennis, Chaudoir*, Bull. Mosc. 1855, i, p. 81.

Head with the lateral truncature on each side straight or only slightly emarginate, preocular angles projecting slightly laterally, frontal impressions shallow, clypeus and front moderately striate, the striæ rather variable in depth and closeness, vertex, neck, and a small area near front angles smooth and shiny, mandibles as long as head, very finely obliquely striate, median carina only a little sinuate, basal tooth of right mandible more or less bifid; eyes moderately convex, genæ much shorter than eye and not projecting so far laterally, but contracted rather sharply to neck; antennæ moniliform, evidently dilated towards apex, just reaching hind angles of prothorax, joints 5 to 10 as wide as long; mentum vaguely rugose, a narrow carina running from base to apex on each side at a little distance from margin. *Prothorax* slightly wider than head and a fourth wider than long, base not produced, though its sides are bent a little backwards near the median part, front angles rounded and inconspicuous, sides very gently rounded, hind angles with a small tooth and a pore and seta; median line and front transverse impression both fine the latter deep and subcrenulate near the angles, basal foveæ just visible, granulate, surface otherwise smooth and very shiny. *Elytra* very faintly dilated behind, barely wider than prothorax, rather less than twice as long as wide, sides of base curving gently backwards to shoulders, which are only slightly dentate; striæ impunctate, shallow, only moderately deep behind shoulder, disappearing before apex, 4 to 6 bending a

little outwards at base; intervals flat on disk, somewhat convex at sides, without granulation, 2 and 4 slightly wider than the rest, 3 with two pores near apex, marginal channel very finely granulate, surface very smooth in front, apical fourth shagreened and dull, the dullness caused by the finely rugose-punctate surface, in conjunction with a fairly conspicuous microsculpture. *Sternum*: proepisterna slightly granulate, metepisterna finely rugose, about twice as long as wide. *Legs*: protibiæ with four or five denticulations above upper tooth; mesotibiæ with two spurs.

Length, 18·5–28 mm.

ASSAM: Khasi Hills. BENGAL. CENTRAL PROVINCES: Nagpur (in stomach of black ibis) and Nagbhir, Chanda district (*E. A. d'Abreu*). MADRAS. BURMA: Toungoo (*L. Fea*). MALAY STATES. SIAM. INDO-CHINA. CHINA. PHILIPPINE IS.

Type, as also that of *rugipennis*, in Mr. René Oberthür's collection.

107. **Scarites ceylonicus**, *Chaud.*

Scarites ceylonicus, Chaudoir *, Mon. p. 85; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72.

Head with the lateral truncature on each side faintly emarginate, the preocular angle not projecting laterally, frontal impressions moderately deep, surface moderately to finely striate, sometimes only in the impressions and on clypeus, neck smooth; mandibles finely striate, barely as long as head, median carina gently sinuate; eyes moderately prominent, genæ small and not projecting so far laterally as eyes; antennæ moniliform, hardly reaching hind angles of prothorax, joints 5 to 10 quite as wide as long, a little wider near apex; mentum subasperate, the sides slightly bordered. *Prothorax* a fifth wider than head and as much wider than long, base not produced, its sides faintly rounded and sometimes vaguely bent just in front of median part, front angles not advanced and very little rounded, sides slightly rounded, hind angles with a moderate tooth, and also with a pore and seta; median line and front transverse impression moderately deep, latter deeper near angles, basal foveæ obsolete, the base granulate at sides, surface nearly smooth and very shiny. *Elytra* faintly dilated behind, barely wider than prothorax, not quite twice as long as wide, sides of base curving backwards rather sharply to shoulders, which are slightly dentate; striæ very faintly impressed, finely and indistinctly punctate, disappearing before apex, 5 and 6 bending a little outwards at base; intervals flat, without granulation along sides, 2 and 3 generally a little wider than the others, 3 with two pores near apex; surface

minutely rugose-punctate throughout, though often moderately shiny, without evident microsculpture. *Sternum*: episterna and sides of sterna more or less granulate, metepisterna twice as long as wide. *Legs*: protibiæ with about 4 denticulations, often very small, above the upper tooth; mesotibiæ with two spurs.

Length, 18–25 mm.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*). CEYLON: Colombo (*G. Lewis*); Hambantota (*T. B. Fletcher*); Galle (*Doria*); Kandy (*Uzel*); Kalawewa, Kaduwala, Hanwella, and Ranna (Colombo Mus.). BURMA: Tharrawaddy (*G. Q. Corbett*); Toungoo (*C. F C. Beeson*); Tenasserim (*J W. Helfer*). PENANG. LAOS. ANNAM.

Type in Mr. René Oberthür's collection.

In Southern China and Indo-China a variety is met with, which, though otherwise resembling the typical form, has only a single apical pore on interval 3; this is var. *estriatus*, Fairm. (Ann. Soc. Ent. Belg., 1887, p. 93).

108. **Scarites sulcatus**, *Oliv.* [Fig. 39 (19).]

Scarites sulcatus, Olivier, Ent. iii, 36, 1795, p. 7, t. 1. f. 11; Dejean, Spec. Gen. i, 1825, p. 375; Chaudoir, Bull. Mosc. 1855, i, p. 107; id., Mon. p. 80; Bates, Proc. Zool. Soc. 1888, p. 369; id., Entom. 1891, Suppl. p. 8; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 272; Tchitcherin, Rev. Russ. Ent. 1904, p. 263; Andrewes in Mission Babault. Ind. Carab. 1924, p. 10.

Scarites geryon, Hope *, Zool. Misc. 1831, p. 21; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 170.

Scarites chinensis, Erichson *, in Nov. Act. Leop. Carol. Nat. xvi, Suppl. i, 1834, p. 220; Chaudoir, Bull. Mosc. 1855, i, p. 107; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 101.

Head with the lateral truncature on each side slightly emarginate, the preocular angle projecting laterally, frontal impressions very shallow, clypeus and front covered with longitudinal striæ, which, though coarse, are not usually deep, vertex and neck smooth, as are sometimes the sides in front; mandibles as long as head, rugose-striate, median carina slightly sinuate at about basal third, left mandible with basal tooth very long and deeply emarginate, bifid at both extremities, a small tooth towards apex, right mandible with a rather long bifid basal tooth and a smaller one between it and apex, the carina normally present on the latter obsolete; eyes rather flat, genæ projecting beyond them and forming on each side a rounded knob behind and beneath them; antennæ stout reaching hind angle of prothorax, joints 5 to 10 a little longer than wide. *Prothorax* very little wider than head. a fourth wider than long, base slightly produced at middle, its sides nearly straight, front angles projecting a little forward and

fairly sharp, sides bisetose, nearly straight, though somewhat rounded in front and behind, hind angles marked by a small tooth; median line and front transverse impression both moderately deep, latter shallower at middle, but deeper, crenulate, and subrugose near angles, basal foveæ small but evident, granulate and with some transverse striæ, marginal channel subrugose. *Elytra* slightly dilated behind, as wide as prothorax and not quite twice as long as wide, sides of base curving gently backwards to shoulders, which are slightly dentate, the border crenulate just behind them; striæ deep, punctate, much deeper at sides, where the punctures become transverse, 3 turning a little inwards close to base; intervals convex, much more so at sides, gradually narrowing from base to apex, 6 and 7 narrowing close to base, where 7 is almost costate, 8 not reaching base, 3 with three (exceptionally two) pores on apical half, the one close to apex often indistinct; surface smooth in front, apical fifth strongly rugose-punctate and dull, without microsculpture. *Sternum*: sterna smooth, metepisterna more than twice as long as wide. *Legs*: protibiæ with three or four very blunt denticulations; mesotibiæ with two spurs; metatibiæ with a fringe of six or eight long setæ.

Length, 28–43 mm.

ASSAM: Khasi Hills; Tinne, on the Mishmi frontier (*F Bailey*). NEPAL: Soondrijal. SIKKIM. UNITED PROVINCES: Sitapur and Almora (*H. G. Champion*); Naini Tal; Garhwal. PUNJAB: Murree; Kulu; Kangra, Spiti, and Baddia (*G. Babault*). BURMA: Bhamo (*L. Fea*); Tavoy. JAVA. SUMATRA. INDO-CHINA. CHINA. FORMOSA. KOREA.

Type lost, that of *geryon* in the British Museum, that of *chinensis* in the Berlin Zoological Museum.

The species will be readily known by its large size, narrow form, and deep punctate striæ. It has a very wide distribution in South-East Asia, but has not been recorded from Japan. In India it is confined to the Himalayan tract and its vicinity.

109. Scarites dyschromus, *Chaud.*

Scarites dyschromus, Chaudoir*, Bull. Mosc. 1855, i, p. 78; id., Mon. p. 82.

I saw some years ago in Mr. R. Oberthür's collection the two specimens on which this species was described and have come across no others. Chaudoir was doubtful whether to treat them as specifically distinct from *sulcatus* or not, but decided to keep them separate. In these circumstances I can only follow his lead and give a translation of his description.

"Very near *sulcatus*. The head is as strongly striate as in the specimens of *sulcatus* in which this character is most pronounced; the prothorax is actually and relatively a little wider, its sides are a little less parallel and the front angles a little more advanced; the line parallel to the front border is as much impressed at the middle as at the sides, the surface is rather strongly transversely striate, the lateral channel rugose; the elytra are not contracted in front and are more parallel; the striæ are wider and are covered at bottom by a very fine but close rugosity, in which the punctures to be seen in *sulcatus* disappear; the intervals are finely shagreened, and become more so towards apex. The apical joints of the antennæ are longer."

Length, 33–36 mm.

"INDES ORIENTALES" (which in this case no doubt means North India) (*Capt. Boys* and *Dr. Bacon*).

Type in Mr. René Oberthür's collection.

110. **Scarites tauropus**, sp. nov. [Fig. 38 (6).]

Head large, lateral truncature not emarginate, preocular angles projecting a little laterally, frontal impressions short, wide, and shallow, surface rather coarsely striate, neck and front angles smooth, a deep, almost transverse impression behind eye; mandibles well developed, nearly as long as head, obliquely striate, scrobe longitudinally striate, median carina moderately sinuate a little before middle, left mandible with a long tooth, emarginate and with a sharp point at each extremity, a second small tooth just above it, right mandible with two teeth, the basal one blunt and bifid, the other rather small and only a little in front of middle; eyes moderately prominent, enclosed behind by genæ, which are conspicuous and rather shorter than eye, project a little further laterally, and slope gradually to neck behind; antennæ almost filiform, reaching base of prothorax, joints 5 to 10 twice as long as wide; mentum striate-granulate, narrowly bordered at sides. *Prothorax* a little wider than head, a half wider than long, base with the median part moderately produced and with a thick border, its sides nearly straight, front angle just projecting as a minute tooth on each side, sides bisetose, gently rounded, but more strongly so close to front angles, hind angles with a well-marked tooth; median line rather fine, front transverse impression moderately deep, deeper at sides, finely but indistinctly crenulate, basal foveæ slight but wide, strongly granulate, the granulation appearing faintly in basal and lateral channels, and distinct round front angles. *Elytra* slightly dilated behind, barely wider than prothorax, rather less than twice as long as wide, sides of base curving gently

to shoulders, which are only slightly dentate ; striæ impunctate, moderately impressed on disk, deeper at sides ; intervals rather flat on disk, distinctly convex at sides, conspicuously granulate along their margins, 3 with four pores (left front one missing in type), surface moderately shiny, but with some cross-striation in front, sides behind middle and apex minutely rugose, apex also slightly granulate, microsculpture visible behind, but in front only in the striæ. *Sternum* : all episterna and sides of metasternum granulate, metepisterna twice as long as wide. *Legs* : protibiæ with 4 or 5 denticulations above upper tooth, mesotibiæ with two strong spurs.

Length, 35–39 mm.

BENGAL : Sara Ghat, River Ganges (Ind. Mus.). " India " (Brit. Mus.).

Type in the British Museum.

111. **Scarites pinguis**, sp. nov. [Fig. 39 (20).]

Head very large, lateral truncature slightly emarginate, preocular angle projecting a little laterally, frontal impressions shallow, front with rather coarse, very wavy, longitudinal striæ, which die away at hind-eye level ; a small smooth area near front angles, a deep depression along inner margin of eye ; mandibles a little shorter than head, rather coarsely obliquely striate, median carina strongly sinuate at a third from base, left mandible with a wide, faintly emarginate, basal tooth and a small obtuse one towards apex, right one with two well developed teeth and a fairly deep emargination between them, the lower one slightly bifid ; eyes moderately prominent, genæ fairly conspicuous, not quite as long as eye or projecting as far laterally, sloping gradually to neck ; antennæ stout, reaching rather beyond base of prothorax, joints 5 to 10 about a half longer than wide ; mentum granulate, bordered at sides. *Prothorax* a little wider than head and a third wider than long, widest near front angles, base moderately produced at middle, its sides straight, front angles fairly sharp and projecting a little forwards, sides bisetose, very gently rounded, hind angles moderately dentate ; median line fine, front transverse impression moderately deep, deeper at sides, basal foveæ slight, granulate, the granulation extending vaguely to basal and lateral channels. *Elytra* somewhat dilated behind, as wide as prothorax, and very little less than twice as long as wide, sides of base curving gently back to shoulders, which are slightly toothed ; striæ impunctate, rather shallow on disk, moderately deep at sides ; intervals convex, slightly on disk, more evidently at sides, without granulation (except on outer ones behind shoulder), 3 with four pores ; surface practically uniform, a little dull, a microsculpture visible

throughout, as also on base of prothorax. *Sternum*: pro- and metasterna and episterna slightly and vaguely granulate, metepisterna twice as long as wide. *Legs*: protibiæ with 3 or 4 small denticulations above upper tooth; mesotibiæ with two spurs.

Length, 29–30 mm.

BENGAL: Murshidabad; Rajabhatkhawa. BIHAR: Pusa (*E. Hassan*); Chapra (*Mackenzie*-type). ORISSA: Chandipur (*F. H. Gravely*). UNITED PROVINCES: Chakrata.

Type in the British Museum.

112. **Scarites dentatus**, sp. nov.

Scarites prædator, Bates (not Chaud.), Ann. Mus. Civ. Gen. xxxii, 1892, p. 273 (Teinzo); Andrewes in Mission Babault Ind. Carab. 1924, p. 10 (Kalka).

Head with lateral truncature faintly emarginate, the preocular angle projecting very slightly laterally, frontal impressions wide and shallow, surface finely to moderately striate, the striæ fading away at back of neck, a small smooth area near front angles, a moderate sulcus along inner margin of eye; mandibles stout, not quite as long as head, obliquely striate, median carina sharply sinuate at a third from base, left mandible with a wide, slightly emarginate, basal tooth, and a second small one towards apex, right mandible with two well-developed and fairly sharp teeth, the basal one bifid, a deep emargination between them; eyes rather flat, genæ shorter than eyes, inconspicuous, and sloping gradually to neck; antennæ just passing hind angles of prothorax, joints 5 to 11 a little longer than wide; mentum very slightly granulate, bordered at sides. *Prothorax* about a fifth wider than head, a fourth wider than long, widest not far from front angles, base evidently produced and with a thick border, its sides straight, front angles conspicuous, projecting forward on each side as a sharp tooth, sides bisetose, gently rounded, more sharply near front angles, the border sometimes finely crenulate, hind angles with a sharp, well-developed tooth; median line rather fine, front transverse impression finely crenulate, moderately deep, at least at sides, basal foveæ just visible, slightly granulate, some granulation visible in basal and lateral channels. *Elytra* slightly dilated behind, a little wider than prothorax, and rather less than twice as long as wide, sides of base straight, sloping backwards to shoulders, which have each a sharp tooth; striæ impunctate, shallow, hardly deeper at sides; intervals nearly flat on disk, slightly convex at sides, granulate along their margins, almost imperceptibly on disk and towards apex, but conspicuously at sides, especially behind shoulders, where the granules are

unusually coarse, 3 with four or five pores; surface minutely rugose and nearly uniform, microsculpture just visible, chiefly in the striæ. *Sternum*: pro- and metasterna with only traces of granulation, metepisterna fully twice as long as wide. *Legs*: protibiæ with 3 or 4 denticulations above upper tooth; mesotibiæ with two spurs.

Length, 27–31 mm.

ASSAM (Brit. Mus.); Tezpur (*Desenne*—Pusa Coll.). BENGAL: Sahibganj (*J. Wood Mason*—Ind. Mus.); Sukna. PUNJAB: Kalka (*G. Babault*); Multan (*C. F C. Beeson*). BURMA: Teinzo (*L. Fea*); Thaungyin Valley (Brit. Mus.); Yenangyaung, Magwe (*J. Coggin Brown*). LAOS (*R. Vitalis de Salvaza*).

Type (Kalka) in my collection.

I can only refer to this species an example taken by Mr. F. W. Champion at Sardah in Bengal; while presenting nearly all the characters of normal specimens, it is only 20 mm. in length, and has three pores only on the third elytral interval.

The species is remarkable for the prominence of the front angles of the prothorax, and the relatively large development and sharpness of the teeth at the hind angles of the prothorax and on the shoulders of the elytra; the granulation behind the shoulders is also unusually coarse.

113. Scarites bengalensis, *Dej.*

Scarites bengalensis, Dejean *, Spec. Gen. ii, 1826, p. 468; Chaudoir, Bull. Mosc. 1855, i, p. 79; id., Mon. p. 89; Bates, Entom. 1891, Suppl. p. 8; Tchitcherin, Rev. Russ. Ent. 1904, p. 263.

Head fairly wide, lateral truncature straight, preocular angle not projecting laterally, area round clypeal suture somewhat depressed, frontal impressions moderately deep, the whole surface covered with fine, rather wavy, longitudinal striæ, fewer near front angles, and disappearing on back of neck; mandibles curved, sharp, and rather slender, longer than head, finely striate-rugose, the median carina rather strongly sinuate at basal third, left mandible with a fairly wide, emarginate, basal tooth, the hind cusp bifid, a second small, but very sharp tooth at some distance from apex, the two teeth separated by a deep emargination, right mandible with two teeth of moderate size, basal tooth jagged, with as many as 4 cusps, second tooth sharp, distant from apex and separated from basal one by a deep emargination; eyes moderately prominent, genæ very inconspicuous, hardly projecting or sloping inwards; antennæ submoniliform, reaching hind angles of prothorax, joints 5 to 10 hardly longer than wide; mentum faintly granulate, with a fine carina on each side near margin. *Prothorax* a fifth wider than head, a fourth wider than long, base with its median part lightly produced,

its sides straight, and only gently bent backwards on joining median part, the lateral angles of which are strongly rounded, front angles rather sharp, though scarcely produced, sides bisetose, almost straight, though rounded close to both front and hind angles, the latter sharply toothed ; median line fine, front transverse impression shallow at middle, deeper at sides, basal foveæ just visible, granulate, some granulation just perceptible along basal and lateral channels. *Elytra* slightly dilated behind, a little wider than prothorax and twice as long as wide, sides of base curving backwards to shoulders, which are slightly, though distinctly dentate ; striæ fairly deep, deeper at sides, with faint, sometimes imperceptible punctures ; intervals moderately flat on disk, convex at sides, 6 to 8 with slight rows of granules along their margins, the granulation hardly visible on inner ones, 3 with four or five pores ; surface shiny, with microsculpture at apex, though visible only in the striæ in front. *Sternum* : mesosternum only granulate, metepisterna fully twice as long as wide. *Legs* : protibiæ with 4 or 5 denticulations above upper tooth ; mesotibiæ with two sharp spurs.

Length, 21–24 mm.

BENGAL : Dinapur (Brit. Mus.). BIHAR : Pusa (*T. B. Fletcher*) ; Chapra (*Mackenzie*). KASHMIR : Gurais Valley (*teste* Bates). CHINA (*teste* Bates). PERSIA (*teste* Tchitcherin).

Type in Mr. René Oberthür's collection.

The specimens described by Chaudoir were taken in " North India." The localities given by Bates and Tchitcherin all require confirmation.

114. **Scarites stenodes**, sp. nov. [Fig. 39 (21).]

Head with lateral truncature faintly emarginate, the preocular angle projecting a little laterally, frontal impressions shallow, surface covered with moderate, wavy, longitudinal striæ, irregular on vertex, disappearing near front angles and on neck ; mandibles rather sharp and slender, about as long as head, vaguely striate, central carina very fine and strongly sinuate at a third from base, external basal angle produced on each side into a rounded tooth, left mandible with a wide tooth at base, the front cusp of which is produced forwards and slightly raised, another minute tooth between it and apex, right mandible with two well-developed, somewhat raised teeth, a deep emargination between them, the carina normally present on front tooth wanting ; eyes rather flat, genæ shorter than eye, not projecting so far laterally, and contracting gradually to neck ; antennæ moniliform, not reaching base of prothorax, joints 5 to 10 only slightly longer than wide ; mentum bordered at sides, faintly granulate close to base,

longitudinally striate in front. *Prothorax* barely wider than head, a fourth wider than long, very slightly contracted behind and widest close to front angles, base with its median part produced and its sides straight, front angles not projecting but not rounded, sides finely bordered, the border vaguely crenulate, straight, though slightly curved close to the angles, hind angles dentate; median line and front transverse impression moderately deep, latter deeper at sides, where a series of minute carinæ crosses it and gives it a crenulate appearance, basal foveæ more evident than usual in the genus, granulate, the granulation extending to basal channel, but hardly visible in the lateral one. *Elytra* with parallel sides, as wide as prothorax and twice as long as wide, sides of base nearly straight, sloping gently backwards to shoulders, which have each a small tooth; striæ impunctate, though minutely and vaguely crenulate, moderately impressed, deeper at sides; intervals nearly flat on disk and behind, moderately convex at sides, outer ones with some granulation along their margins, 3 with four pores on left side and five on right side; surface smooth and shiny in front, apical third rather dull, minutely rugose-punctate and also with microsculpture. *Sternum*: sterna and episterna nearly smooth, prosternal process longitudinally striate, metepisterna more than twice as long as wide. *Legs*: protibiæ with 3 denticulations above upper tooth; mesotibiæ with two sharp spurs.

Length, 24 mm.

PUNJAB: Multan (*O. A. Smith*).

Type in the British Museum. It is a unique specimen and was presented by the Bombay Natural History Society.

115. Scarites semicircularis, *Macl.*

Scarites semicircularis, Macleay *, Ann. Jav. 1825, p. 24; Chaudoir, Bull. Mosc. 1855, i, p. 109; id., Mon. p. 127; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 162.

Scarites subproductus, Chaudoir *, Mon. p. 90; Lesne, Miss. Pavie Hist. Nat. 1904, p. 63.

Scarites mancus, Bates (not Bon.), Ann. Soc. Ent. Fr. 1889, p. 261; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 175.

Head with lateral truncature straight, both angles strongly rounded, the hind one not projecting laterally, frontal impressions short but fairly deep, each containing four or five striæ, which are continued on to clypeus in front, diverge behind, and disappear on reaching neck, a few more striæ and some fine puncturation at sides behind; mandibles rather shorter than head, with very slight longitudinal striation, median carina only gently curved, left mandible with only the front cusp conspicuous on basal tooth, a second small

tooth towards apex, right mandible with two fairly sharp teeth, near together, at about middle; eyes rather prominent, genæ quite inconspicuous; antennæ short, moniliform, joints 5 to 10 rather wider than long; mentum finely granulate, narrowly bordered at sides. *Prothorax* a fourth wider than head and as much wider than long, base with median part evidently produced and thickly bordered, its sides straight, front angles usually inconspicuous, but sometimes with a minute tooth, sides bisetose, almost straight, but rounded close to both front and hind angles, latter with a small but sharp tooth; median line and front transverse impression fairly deep, latter not shallower at middle, subcrenulate, basal foveæ just perceptible, granulate, some granulation visible along basal and lateral channels. *Elytra* very slightly dilated behind, hardly wider than prothorax, about twice as long as wide, sides of base curving gently backwards to shoulders, which are minutely dentate; striæ fairly deep, even on disk, evidently though very finely punctate, 3 often bending a little inwards, 4 to 6 a little deeper close to base; intervals moderately convex, with only a suggestion of granulation along the margins of the outer ones, 3 with three pores, at a fourth, three-fourths, and close to apex (exceptionally with a fourth pore just behind middle), surface nearly uniform, smooth, and with a microsculpture covering the whole surface, some microscopic punctures near apex. *Sternum*: episterna and sides of sterna granulate, metepisterna fully twice as long as wide. *Legs*: protibiæ with 1 to 3 denticulations above upper tooth; mesotibiæ with two spurs, the upper one usually smaller than the lower one.

Length, 14–16 mm.

BURMA: Rangoon. MALAY STATES. SIAM. INDO-CHINA. JAVA.

Type in the British Museum, that of *subproductus* in Mr. René Oberthür's collection.

116. **Scarites selene**, *Schm.-Goeb.* [Fig. 39 (13).]

Scarites selene, Schmidt-Goebel *, Faun. Col. Birm. 1846, p. 94; Chaudoir, Bull. Mosc. 1855, i, p. 108; Andrewes, Trans. Ent. Soc. Lond. 1923, p. 55.

Scarites capito, Chaudoir *, Bull. Mosc. 1855, i, p. 92; id., Mon. p. 95; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 273.

Head very large, lateral truncature not emarginate, its angles much rounded, the hind one hardly projecting laterally, frontal impressions rather shallow, surface covered with moderate, rather wavy, longitudinal striæ, which melt away on neck, a small area near front angles smooth, a deep oblique sulcus

on each side, running from within to behind eye ; mandibles very large, strong, and sharp, longer than head, rather lightly striate, median carina hardly sinuate, very gently curved, left mandible with a very large basal tooth, its inner edge raised and somewhat emarginate, a second small tooth a little nearer apex, right mandible with a raised, rounded tooth close to base, concave or slightly bifid at its apex, another sharp tooth at a third from apex, bearing a well-developed carina which runs to the base parallel with the median one ; eyes rather prominent, enclosed behind by the genæ, which are shorter than eyes, do not project as far laterally, and contract rather sharply to neck ; antennæ reaching base of prothorax, joints 5 to 10 nearly twice as long as wide ; mentum concave, minutely rugose, with a wide side-border, the inner margin of which is raised into a carina, which disappears before reaching apex. *Prothorax* barely wider than head, a half wider than long, moderately contracted behind and widest near front angles, base not produced at middle, though with a slight sinuation on each side, front angles projecting forward on each side as a small tooth, sides bisetose, gently rounded, hind angles sharply dentate ; median line fine, front transverse impression fairly deep at sides, shallower at middle, basal foveæ just perceptible, granulate, the granulation extending along basal channel, but not visible in lateral ones. *Elytra* slightly dilated behind, hardly wider than prothorax, not quite twice as long as wide, sides of base nearly straight, sloping gently backwards to shoulders, which have each a small sharp tooth ; striæ fine, a little deeper at sides, impunctate ; intervals nearly flat, slightly convex behind shoulders, without granulation along margins (7 sometimes with traces), 3 with four pores ; surface moderately shiny, nearly uniform, microscopically rugose-punctate, microsculpture distinct near apex, but in front visible only in the striæ. *Sternum* : episterna with some little granulation, metepisterna twice as long as wide. *Legs* : protibiæ with 5 to 7 denticulations above upper tooth ; mesotibiæ with two sharp spurs, the upper shorter than the lower one.

Length, 26–32 mm.

ASSAM. BENGAL : Calcutta ; Dacca (*H. E. Stapleton*) ; Khargpur (*R. Hodgart*). BIHAR : Pusa (*T. B. Fletcher*, *G. P. Pillai*, and *E. Hassan*) ; Patna. UNITED PROVINCES : Lucknow (*Mrs. A. Shadwell*). MADRAS : Palni Hills (*Newton*). CEYLON : Anuradhapura (*W. Horn*). BURMA : Tharrawaddy (*G. Q. Corbett*) ; Toungoo, Palon, and Rangoon (*L. Fea*).

Type in the Prague Museum, that of *capito* in Mr. René Oberthür's collection.

117 **Scarites barbarus**, *Dej.*

Scarites barbarus, Dejean *, Spec. Gen. i. 1825, p. 388 ; Chaudoir, Mon. p. 96 ; Bates, Ann. Mus. Civ. Gen. xxxii. 1892, p. 272 ; Bedel, Cat. rais. Col. N. Africa, 1895, p. 38 (note 2) ; Andrewes, Trans. Ent. Soc. Lond. 1923, p. 55.

Very closely allied to *S. selene*, but usually rather smaller. The chief difference noticeable is in the surface of the head, which is covered with very fine, closely placed, confused striæ, mingled with a few fine punctures, a small area on each side near front angles and the back of the neck nearly, though not quite smooth ; the mandibles are similar in form, but more finely striate, also the basal tooth on the right mandible is nearer the front one (about half-way between it and base) and more evidently bifid, the front tooth similarly carinate ; the oblique sulcus on each side behind eye is only moderately deep ; the carinæ on the sides of the mentum are similar. The form of the prothorax and elytra is exactly as in *selene*, but the elytral striæ are generally a little shallower and the surface is more evidently shagreened.

Length, 23–30 mm.

BENGAL : Dinapur ; Calcutta (*F H. Gravely*). BIHAR ; Pusa (*G. P. Pillai*, *Hassan*, and *Mukerjee*). ORISSA : Balasore (*Gengler*). BURMA : Tharrawaddy (*G. Q. Corbett*) ; Rangoon (*E. M. Janson*, *E. A. d'Abreu*, and *L. Fea*) ; Moulmein (*L. Fea*).

Type in Mr. René Oberthür's collection.

The specimen described by Dejean was said to have been brought from " Tripoli in Barbary," and the species owes its name to this inadvertence.

118. **Scarites corbetti**, sp. nov.

Head with lateral truncature straight, the strongly rounded preocular angle not projecting laterally, frontal impressions shallow, surface covered with fine, closely placed, wavy, longitudinal striæ, which only melt away on back of neck, minutely and inconspicuously punctate, a small area on each side close to front angles nearly smooth ; mandibles as long as head, obliquely striate, median carina slightly sinuate at about middle, left mandible with basal tooth rather deeply emarginate, upper one small and close to it, right mandible with basal tooth raised and bifid, upper one fairly sharp, nearer to basal tooth than to apex ; eyes moderately prominent, genæ inconspicuous ; antennæ moniliform, not reaching hind angles of prothorax, joints 5 to 10 gradually decreasing in length, as wide as long towards apex ; mentum granulate, narrowly bordered at sides. *Prothorax* a fifth wider than head

and a fourth wider than long, base not produced at middle, front angles inconspicuous, sides bisetose, forming with sides of base a regular curve, interrupted only by the small tooth at hind angle on each side; median line moderately deep, front transverse impression shallow at middle, deep at sides, finely crenulate, basal foveæ obsolete, sides of base, basal channel, and a small area close to front angles granulate. *Elytra* slightly dilated behind, about a sixth wider than prothorax, not quite twice as long as wide, sides of base curving gently backwards to shoulders, which are slightly dentate; striæ impunctate, moderately deep, rather deeper at sides; intervals moderately convex, outer ones with traces of granulation along margins, 3 with four pores; surface shiny, faintly shagreened near apex, with traces of microsculpture in the striæ only. *Sternum*: metasterna and sides of sterna granulate, metepisterna twice as long as wide. *Legs*: protibiæ with 4 or 5 denticulations above upper tooth; mesotibiæ with two spurs.

Length, 21–23 mm.

BURMA: Tharrawaddy (*G. Q. Corbett*).

Type in my collection.

119. Scarites inconspicuus, *Chaud.*

Scarites inconspicuus, Chaudoir*, Bull Mosc. 1855, i, p. 82; id., Mon. p. 97; Bates, Scientific Results of Second Yarkand Mission, 1891, Col. p. 3; Andrewes in Mission Babault Ind. Carab. 1924, p. 10.

Head with the lateral truncature straight, the preocular angle not projecting laterally, frontal impression not very deep, moderately striate, together with clypeus and sides behind, neck slightly constricted at sides and faintly punctate, the punctures sometimes numerous and stretching right across; mandibles as long as head, moderately striate, median carina evidently, though not sharply carinate at middle, the carini-form upper edge of scrobe bent a little inwards at the same place, basal tooth in both mandibles more or less trifid; eyes rather flat, genæ inconspicuous, much shorter than eyes; antennæ moniliform, joints 5 to 10 wider than long; mentum faintly granulate and narrowly bordered at sides. *Prothorax* a fifth wider than head and as much wider than long, base not produced, its sides straight, front angles slightly advanced and rather sharp, sides bisetose, nearly straight, but rounded close to front and hind angles, latter dentate; median line moderately deep, front transverse impression deep, hardly less so at middle, indistinctly crenulate, basal foveæ obsolete, sides of base and basal channel somewhat granulate. *Elytra* very slightly dilated behind, about as wide as prothorax and

twice as long as wide, sides of base curving gently backwards to shoulders, which have each a small tooth; striæ deep, impunctate, 4 to 6 a little deeper near base; intervals convex, without granulation, 3 with four pores, which are often inconspicuous; surface shiny, nearly uniform, with a fine microsculpture, not quite obliterated even close to base, apex also microscopically punctate. *Sternum*: episterna more or less granulate, metepisterna fully twice as long as wide. *Legs*: protibiæ with 2 or 3 denticulations above upper tooth; mesotibiæ with two sharp spurs, the upper shorter than the lower one.

Length, 18–21 mm.

NEPAL. ASSAM: Sibsagar (*S. E. Peal*); Margherita (*T. B. Fletcher*); Srimangal. SIKKIM (*Mandelli*). BENGAL: Calcutta. BIHAR; Chapra (*Mackenzie*); Muzafferpur; Kierpur (*C. Paiva*); Tinpahar. UNITED PROVINCES: Ranikhet and Tanakpur (*H. G. Champion*); Naini Tal; Dehra Dun. PUNJAB: Jhelum Valley. N.W FRONTIER PROVINCE: Kohat (*T. B. Fletcher*). INDORE: Mhow. CENTRAL PROVINCES: Nagpur, Hingna, and Pauni (*E. A. d'Abreu*); Motinala, Mandla, Majhgaon, and Rajadhar (*G. Babault*). MADRAS: Surada; Yercaud.

Type in Mr. René Oberthür's collection.

The striæ of the elytra are normally impunctate, but traces of punctures are sometimes visible, as also of granules along the sides of the intervals, in both cases near base only.

120. **Scarites derogatus**, sp. nov. [Fig. 39 (15).]

Head with lateral truncature not emarginate, preocular angle projecting very slightly, frontal impressions shallow, surface moderately striate, the neck and usually a small area near front angles smooth; mandibles sharp, finely striate, as long as head, median carina strongly sinuate at a third from base, left mandible with basal tooth deeply emarginate, right mandible with basal tooth raised and more or less trifid, the front tooth a little nearer to it than to apex, eyes rather flat, genæ evident, though much shorter than eyes, and not usually projecting as far laterally; antennæ reaching hind angles of prothorax, joints 5 to 10 quite half as long again as wide; mentum vaguely granulate, with narrowly bordered sides. *Prothorax* about a fourth wider than head and a third wider than long, base not produced, but with an obtuse angle at each end of the median part, its sides nearly straight, front angles projecting slightly forwards, sides bisetose, gently rounded, more strongly near front angles, a small tooth at each hind angle; median line rather fine, front transverse impression moderately deep throughout, with only traces of crenulation, basal foveæ just indicated, slightly granulate, the

granulation not extending either to basal channel or lateral ones, *Elytra* faintly dilated behind, slightly though evidently wider than prothorax, rather less than twice as long as wide, sides of base curving very gently backwards to shoulders, each of which bears a small tooth; striæ impunctate, clearly impressed and moderately deep at sides; intervals moderately convex, with some fine though rather faint granulation along margins, sometimes obsolete on disk, 3 with four or five pores; surface smooth, though dull behind, covered by a microsculpture, which is much more evident behind than in front. *Sternum*: episterna and sides of sterna lightly granulate, metepisterna twice as long as wide. *Legs*: protibiæ with 3 to 5 denticulations above upper tooth; mesotibiæ with two nearly equal spurs.

Length, 25–31 mm.

ASSAM: Tezpur (Desenne); Brahmaputra River above Jorhat (*T. B. Fletcher*). BENGAL: Kaliganj. BIHAR; Pusa; Chapra (*Mackenzie*). DELHI (*C. R. Cooke*—type). UNITED PROVINCES: Naini Tal. MADRAS: Bangalore; Pondicherry. BURMA: Bhamo (*L. Fea*). PENANG (Brit. Mus.).

Type in my collection.

121. **Scarites retusus**, sp. nov.

As large as average specimens of *derogatus*, and agreeing with that species in the majority of characters. The striæ on the head are few and relatively far apart; the genæ are more evident, projecting laterally as far as eyes, and contracting rather sharply behind; the mandibles are less densely striate, but the median carina is similar, the basal tooth in the left one fully half the length of the mandible, with its front margin somewhat obliquely truncate, while in the right one the emargination between the teeth is deeper and the front tooth is a little nearer to apex than to basal tooth. The prothorax is a little more contracted behind, evidently widest near front angles, which do not project at all, and which, instead of being a little in advance of the front margin adjoining them, are situated well behind it; the sides are nearly straight, and only slightly, instead of strongly rounded close to the front angles; the basal foveæ are distinctly granulate, the granulation extending to some extent both along basal and lateral channels, and to the area within the front angles. The elytra are exactly as wide as prothorax and twice as long as wide; the striæ are a little less impressed, the intervals more evidently, though very finely granulate along margins, 3 with five pores.

Length, 29 mm.

ASSAM: Dilkusha (*Inglis*).

Type in the British Museum.

122. **Scarites granulatus**, sp. nov.

Like the last one this species presents characters agreeing in the main with those of *derogatus*, but differing as follows. The head has the lateral truncature on each side slightly emarginate, and is finely and densely striate (as in *barbarus*), with only a small smoother area on each side near front angle. The prothorax is similar in its general shape, though less rounded close to front angles; in other respects it resembles that of *retusus*, with its inconspicuous front angles behind the level of the adjoining front margin, and with exactly similar granulation. The elytra have the basal area and margins of intervals conspicuously, but not coarsely granulate, the rows of granules on the latter uniform throughout, the apical third rather strongly shagreened, interval 3 with five pores.

Length, 28 mm.

BIHAR: Pusa (*T. B. Fletcher*—type). BENGAL: Goalundo to Gauhati, Brahmaputra River (*T. B. Fletcher*).

Type in the British Museum.

There are two examples, which, though agreeing well in nearly all their characters, differ in two particulars. In the type there is a distinct emargination visible from above between eye and gena, which is not apparent in the second specimen, and, although in the latter the front margin of the prothorax is cut back at sides, the angle itself projects a little more forward, so as to be very nearly level with the adjoining front margin.

123. **Scarites prædator**, *Chaud.*

Scarites prædator, Chaudoir*, Mon. p. 97; Bates, Ann. Civ. Gen. xxxii, 1892, p. 273 (part); Andrewes in Mission Babault Ind. Carab. 1924, p. 10 (part).

Head with lateral truncature straight, the preocular angle projecting laterally only very slightly, frontal impressions moderately deep, surface covered with rather fine, wavy, longitudinal striæ, but generally smooth near front angles, on vertex, and on neck; mandibles barely as long as head, moderately striate, median carina strongly sinuate at a third from base, left mandible with basal tooth very large, emarginate, right mandible with the basal tooth raised and slightly bifid; eyes moderately prominent, genæ inconspicuous, shorter than eyes, sloping gently to neck; antennæ reaching hind angles of prothorax, joints 5 to 10 nearly as wide as long; mentum faintly granulate, narrowly bordered at sides. *Prothorax* a fifth wider than head, a third wider than long, very little contracted behind, though widest near front angles, base not or only slightly produced at middle, its sides straight,

front angles projecting forward on each side as a small tooth, sides bisetose, almost straight, but rounded close to the angles, hind angles dentate ; median line and front transverse impression moderately deep, latter deeper at sides and finely crenulate, basal foveæ just visible, granulate. *Elytra* very slightly dilated behind, a little wider than prothorax, not quite twice as long as wide, sides of base curving gently backwards to shoulders, which bear each a small tooth ; striæ impunctate, rather shallow on disk, a little deeper at sides in front ; intervals slightly convex, a little more convex at sides, each with a row of minute granules along margins (occasionally wanting on inner ones), 3 with five (sometimes only 4) pores ; surface moderately shiny, microscopically rugose-punctate, with a microsculpture, which is distinct on apex, but in front visible only in the striæ. *Sternum* : episterna moderately granulate, metepisterna twice as long as wide. *Legs* : protibiæ with 3 or 4 denticulations above upper tooth ; mesotibiæ with two sharp spurs, upper usually shorter than lower one.

Length, 20–23 mm.

ASSAM : Tezpur (*Desenne*) ; Kaliganj. SIKKIM. BENGAL : Dacca (*H. E. Stapleton*) ; Sahibganj ; Kumarkhali. BIHAR : Pusa (*H. M. Lefroy* and *T. B. Fletcher*). ORISSA : Chandipur (*F H. Gravely*). KASHMIR : Sonemerg (*T. R. D. Bell*) ; Baltal (*G. Babault*). PUNJAB : Jhelum, 5000 ft. (*T. R. D. Bell*) ; Changa-Manga ; Spiti (*G. Babault*) ; Rawalpindi (*G. Hodgart*). BOMBAY : Kanara (*T. R. D. Bell*). MADRAS : Kodaikanal (*Castets*) ; Nilambur (*C. F. C. Beeson*). BURMA : Tharrawaddy (*G. Q. Corbett*) ; Palon, Toungoo, Thigyam (all *L. Fea*) ; Insein (*T. B. Fletcher*) ; Rangoon (*L. Fea* and *E. A. d'Abreu*) ; Moulmein (*L. Fea* and *J. W Helfer*).

Type in Mr. René Oberthür's collection.

Chaudoir gives the length of this species as 21–26·5 mm., but none of the numerous examples I have seen has exceeded 23 mm., and I think he may possibly have confused another species with this one.

In this species the base of the prothorax is sometimes slightly produced at middle, and this is distinctly the case in the Nilambur example.

124. **Scarites fletcheri**, sp. nov. [Fig. 38 (10).]

Head with lateral truncature straight, preocular angle not projecting laterally, frontal impressions slight, surface rather closely and conspicuously longitudinally striate, the striæ disappearing on neck, though a few cross it, a slight smooth space on each side near front angles, a few fine punctures at sides behind ; mandibles as long as head, faintly striate, median carina sinuate just behind middle, left mandible

with basal tooth so deeply emarginate as to form two teeth, the front cusp carinate, a very small tooth nearer apex, right mandible with the basal tooth raised, trifid; eyes moderately prominent, genæ inconspicuous; antennæ barely reaching hind angles of prothorax, joints 5 to 10 slightly transverse; mentum finely granulate, sides narrowly bordered. *Prothorax* a little wider than head and as long as wide, base not produced, its sides nearly straight, but faintly sinuate on each side near the median part, front angles very inconspicuous, sides straight and parallel, only slightly rounded close to angles, hind angles each with a small tooth; median line and front transverse impression rather faintly impressed, latter deeper close to angles and interrupted at middle, basal foveæ a little more marked than usual, finely granulate, front margin conspicuously longitudinally striate. *Elytra* with parallel sides, barely wider than prothorax, twice as long as wide, sides of base sloping gently backwards to shoulders, which have each a small tooth; striæ impunctate, moderately deep and hardly any deeper at sides; intervals moderately convex, with traces of fine granulation along margins, 3 with four pores, surface shiny in front, shagreened at apex, microsculpture visible only in the striæ. *Sternum*: episterna and sides of sterna finely granulate, metepisterna twice as long as wide. *Legs*: protibiæ with 5 denticulations above upper tooth; mesotibiæ with two spurs.

Length, 22 mm.

ASSAM: Brahmaputra River, above Jorhat, at light, 11 May, 1920 (*T. B. Fletcher*).

Type in the British Museum.

125. **Scarites batesi**, sp. nov. [Fig. 38 (3).]

Scarites denticulatus, Bates (not Chaud.), Ann. Mus. Civ. Gen. xxxii, 1892, p. 273.

Head with lateral truncature straight, its angles rounded, the hind more obtuse than the front one, and not projecting laterally, frontal impressions shallow, surface with some fine, shallow, longitudinal striæ, sides in front, vertex, and neck smooth; mandibles sharp and slender, moderately striate, not quite as long as head, left mandible dilated outwards at base, the median carina gently curved, basal tooth deeply emarginate, its front cusp carinate and larger than the hind one, no small second tooth, right mandible with median carina strongly sinuate, basal tooth raised, trifid, front tooth rather small; eyes moderately prominent, genæ about half as long, not projecting quite so far, and contracted rather sharply to neck; antennæ moniliform, evidently dilated

towards apex, joints 5 to 10 approximately as wide as long; mentum subgranulate, the sides narrowly bordered. *Prothorax* barely wider than head and practically as long as wide, base not produced, but with the sides forming a continuous curve, interrupted only by the slight emargination in the base and the small teeth at hind angles, sides bisetose, very slightly contracted behind, front angles projecting forward on each side as a minute tooth; median line rather fine, front transverse impression very deep at sides, rather less deep at middle, basal foveæ just visible, granulate. *Elytra* hardly dilated behind, but contracted a little at base, just wider than prothorax and twice as long as wide, base very slightly emarginate, its sides sloping back rather sharply to shoulders, which are slightly dentate; striæ impunctate, moderately impressed on disk, deeper at sides; intervals rather flat, more convex at sides, with microscopic rows of granules bordering the striæ, 3 with four conspicuous pores; surface shiny, shagreened near apex, with a fine microsculpture visible only in the striæ. *Sternum*: episterna granulate, metepisterna twice as long as wide. *Legs*: protibiæ with 3 denticulations above the upper tooth; mesotibiæ with two small, sharp spurs.

Length, 17 mm.

BURMA: Teinzo (*L. Fea*).

Type in the Genoa Civic Museum.

The specimen is unique, and Bates identified it with some hesitation as *S. denticulatus*, Chaud. It is smaller than the example of that species in my collection, the head much more finely striate, the genæ more evident and more sharply contracted to neck, the prothorax narrower, the base of the elytra much more and more finely granulate, the apex shagreened.

126. **Scarites cormoides**, sp. nov. [Fig. 38 (5).]

Head large, with the front angles rounded and only indistinctly truncate, preocular angle not projecting laterally, frontal impressions only just visible, sides of clypeal suture rather deeply impressed, surface finely, densely, and somewhat irregularly longitudinally striate; mandibles nearly as long as head, with strong sharp teeth directed somewhat upwards and irregularly striate, median carina gently curved, left mandible with a large, bicuspid basal tooth, the front cusp long and sharp, front tooth wanting, right mandible with the front tooth a little longer than the hind one, the carina on it not quite joining median carina; eyes very flat, hardly visible from above, genæ long, just visible, and sloping very gradually to neck; antennæ moniliform, a little dilated towards apex,

at least joints 8 to 10 slightly transverse ; mentum subgranulate, the tooth carinate, the sides finely and slightly bordered. *Prothorax* very faintly contracted behind, barely wider than head and slightly longer than wide, base not produced at middle, front angles inconspicuous, sides nearly straight, though actually faintly emarginate, bisetose, hind angles moderately dentate ; median line very fine, front transverse impression shallow throughout, basal foveæ obsolete, granulate. *Elytra* hardly dilated behind, as wide as prothorax and two and a quarter times as long as wide, base widely emarginate, its sides short, curving back sharply to shoulders, which are only faintly and obtusely dentate ; striæ fine but clear, impunctate, uniform throughout ; intervals rather flat, with minute rows of granules bordering the striæ, 3 with five very large punctures, surface moderately shiny, without any reticulate microsculpture. *Sternum* : sides of metasternum and metepisterna finely and vaguely punctate, latter twice as long as wide. *Legs* : protibiæ without denticulations above the upper tooth ; mesotibiæ with two very short, blunt spurs.

Length, 19 mm.

BIHAR : Chapra (*Mackenzie*).

Type in the British Museum.

127. **Scarites mandibularis**, sp. nov. [Fig. 39 (16).]

Head large, lateral truncature emarginate, preocular angle not projecting laterally, surface covered with moderate, rather wavy, longitudinal striæ, which gradually disappear on neck, a small area near front angles smooth ; mandibles stout, sharp, fully as long as head, rather lightly striate, median carina well developed, raised at base, bent outwards at middle, where the carina bounding the scrobe is bent a little inwards, so that only a narrow space is left between the two carinæ, left mandible subconstricted at middle, with a relatively small bifid tooth at base, another well-developed tooth not far from apex, and a third rather smaller one a little below and behind the apical one, right mandible with a single large bifid tooth at about middle, without any carina on it ; eyes moderately prominent, genæ small and inconspicuous, sloping gradually to neck ; antennæ stout, not reaching hind angles of prothorax, joints 5 to 10 very nearly as wide as long ; mentum substriate, sides rather widely bordered, the lobular sides of tooth much dilated. *Prothorax* a little wider than head, about a third wider than long, base not produced, evidently emarginate at middle, front angles projecting slightly forward, sides bisetose, forming with sides of base a continuous curve on each side, interrupted only by the small tooth at hind angle ; median line and front transverse impression rather fine, the

latter deeper near the angles, basal foveæ slight, granulate, the granulation extending vaguely along the basal channel. *Elytra* with sides practically parallel, as wide as prothorax, not quite twice as long as wide, sides of base curving gently back to shoulders, which are dentate ; striæ moderately impressed, a little deeper at sides, impunctate, 4 and 5 bent a little outwards at base ; intervals moderately convex, with only traces of granulation along margins, 3 with 5 or 6 pores ; surface smooth, but a little shagreened and with a faint microsculpture towards apex. *Sternum* : episterna and sides of sterna more or less granulate, metepisterna twice as long as wide. *Legs* : protibiæ with 4 or 5 denticulations above upper tooth ; mesotibiæ with two stout spurs.

Length, 27–35 mm.

BENGAL : Calcutta (*M. Kassimuddin*—Ind. Mus.). ASSAM : Tezpur (*Desenne*) ; Brahmaputra River above Jorhat (*T. B. Fletcher*—Pusa Coll.). BURMA : Tharrawaddy (*G. Q. Corbett*). " India " (*Hearsey*—Oxford Mus.).

Type (Tharrawaddy) in my collection.

128. **Scarites dubiosus**, sp. nov. [Fig. 38 (11).]

The description of *S. mandibularis* given above applies in most respects to this species, but there is one difference, viz., the form of the mandibles, of such importance that I have felt obliged to separate the two species. The left mandible is not constricted, but has a moderately large, emarginate, basal tooth, with a second very small one nearer apex ; the right mandible has two fairly large teeth, separated by a deep indentation, the basal one somewhat rounded and more or less trifid. The form of the teeth is very much as in *S. derogatus*, but whereas in that species the central carina is strongly sinuate, here it is only gently curved. The mentum is only narrowly bordered at sides, and the sides of the tooth are much less dilated than in *mandibularis* ; the third elytral interval bears 4 to 6 pores, usually 5.

Length, 26–30 mm.

ASSAM : Tezpur (*Desenne*—Pusa Coll.) ; Sibsagar (*S. E. Peal*—Ind. Mus.). BENGAL : Calcutta. DELHI (*C. R. Cooke*). UNITED PROVINCES : Dehra Dun. BURMA : Pegu.

Type (Pegu) in the British Museum.

129. **Scarites scævus**, sp. nov. [Fig. 38 (1).]

Head with lateral truncature straight, preocular angle much rounded and not projecting laterally, frontal impressions shallow, surface rather coarsely striate, vertex, neck, and a small area near front angles nearly smooth ; mandibles not

quite as long as head, median carina moderately raised at base, strongly sinuate, a few coarse, oblique striæ on basal half, left mandible subconstricted at middle, with a wide basal tooth, on the front of which is a rounded, projecting knob, a smaller tooth towards apex, right mandible with a well developed, vertically bifid tooth at middle, with an indistinct carina, which at once joins the median one ; eyes moderately prominent, genæ shorter than eyes, sloping gently backwards to neck ; antennæ stout, not reaching hind angles of prothorax, joints 5 to 10 about as wide as long ; mentum finely granulate on basal half, sides rather narrowly bordered. *Prothorax* just wider than head, a fifth wider than long, base not produced, front angles minutely dentate, sides bisetose, almost straight, curving in a little to front angles, hind angles dentate ; median line fine, front transverse impression obsolete at middle, except at junction with median line, where there is a depression, shallow even near front angles, basal foveæ just visible, granulate, the granulation extending vaguely to basal channel. *Elytra* with sides very faintly dilated behind, as wide as prothorax and very nearly twice as long as wide, sides of base curving gently backwards to shoulders, which have each a small tooth ; striæ impunctate, moderately impressed, though deeper at sides ; intervals moderately convex, more convex at sides, with only traces of granulation along margins, 3 with five pores ; surface smooth, shagreened near apex, microsculpture only visible in the striæ and close to apex. *Sternum* : episterna and sides of sterna granulate, metepisterna fully twice as long as wide. *Legs* : protibiæ with 6 denticulations above upper tooth ; mesotibiæ with two spurs, the upper smaller than the lower one.

Length, 22 mm.

BIHAR : Pusa (*T. B. Fletcher*).

Type in the British Museum.

130. **Scarites liopterus**, *Chaud.* [Fig. 38 (2).]

Scarites liopterus, Chaudoir *, Mon. p. 87.

Head with the lateral truncature slightly emarginate, the preocular angle much rounded and only just projecting at side, frontal impressions rather shallow, a slight linear impression in each ending in front in a rounded pore not far from the clypeal pore, the whole surface, except neck and a small area on each side near front angles, covered with fine, rather wavy, longitudinal striæ ; mandibles nearly as long as head, also covered with very fine striation, the median carina rather strongly sinuate at about basal third, left mandible with the basal tooth wide, its front cusp rounded, hind one small and

trifid, another small tooth nearer apex, right mandible with basal tooth raised and more or less trifid, front tooth rather sharp ; eyes and genæ moderately prominent, latter projecting nearly as far as eyes, but shorter and disappearing gradually behind ; antennæ fairly long, filiform, joints 5 to 10 longer than wide ; mentum granulate-striate, sides slightly bordered at base. *Prothorax* a fourth wider than head and as much wider than long, base not produced, but with a sinuation on each side of median part, front angles inconspicuous, sides bisetose, gently rounded, hind angles each with a well-developed tooth ; median line fine, front transverse impression much

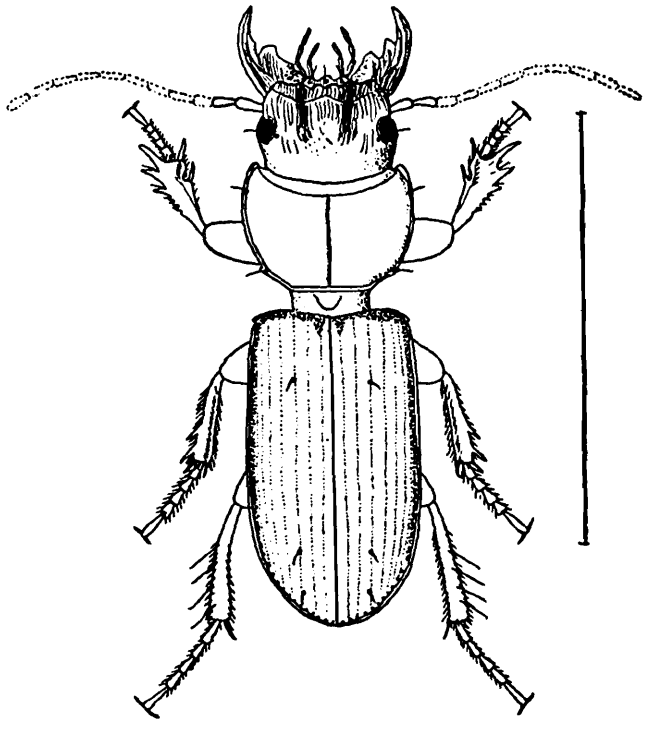


Fig. 40.—*Scarites liopterus*, Chaud.

deeper at sides than in middle, basal foveæ just visible and granulate. *Elytra* faintly dilated behind, very little wider than prothorax and rather less than twice as long as wide, sides of base nearly straight, sloping backwards to shoulders, which have each a small tooth ; striæ hardly impressed, even at sides, very finely and vaguely punctate, disappearing before apex ; intervals flat, without granulation, the even slightly wider than the odd ones, a very faintly impressed, wavy, longitudinal line sometimes visible down the middle, 3 with three pores, one at a fourth from base, the other two near apex ; surface shagreened, though nearly smooth close to base, without evident microsculpture. *Sternum* : episterna

and sides of sterna more or less granulate, metepisterna twice as long as wide. *Legs*: protibiæ with 5 denticulations above upper tooth; mesotibiæ with two spurs.

Length, 33–40 mm.

NORTH INDIA (*Chaudoir*).

Type in Mr. René Oberthür's collection.

The only example seen, other than the type, is in the British Museum; it came from the Fry collection and is labelled "India Orient." The above description has been drawn up on this specimen, but it has been compared with the type and found to agree fairly closely. It is much larger, however, and in less good condition; the antennæ, except the two basal joints, and the last two abdominal segments are missing, and the right elytron has an additional pore just behind middle. In the type the front transverse impression on the prothorax is deepest at middle, and there are only 3 or 4 denticulations on the protibiæ.

131. **Scarites boucardi**, *Chaud.* [Fig. 38 (8 and 9).]

Scarites boucardi, Chaudoir*, Mon. p. 98; Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 469.

Head large, lateral truncature nearly straight, its angles rather sharply rounded, preocular angle projecting a little laterally, frontal impressions only moderately deep, sides of front and clypeus and an area surrounding eyes coarsely striate, middle of front and clypeus, with the neck, smooth, though there is a transverse row of short longitudinal striæ across the middle of front, a deep oblique depression behind eye; mandibles very large, considerably longer than head in well-developed specimens, moderately striate, median carina gently sinuate just behind middle, left mandible with a fairly wide, somewhat jagged tooth extending half-way to apex and a second minute tooth at a fourth from apex, right mandible with basal tooth in the form of a long, irregular lamina, reaching from base to a fourth from apex, and without any carina (in small examples the basal tooth in both mandibles is emarginate in front); eyes flat, genæ forming a fairly sharp knob behind, and extending laterally far beyond them; antennæ stout, reaching hind angles of prothorax, joints 5 to 7 distinctly, 8 to 10 only a little longer than wide; mentum subgranulate, the sides faintly bordered at base, the lobes turned, so that the surface appears hollowed out on each side; paragenæ with an inconspicuous tooth, the inner margin nearly straight. *Prothorax* rather wider than head (measured across genæ) and more than a half wider than long, base slightly produced,

sides bisetose, rather sharply rounded close to front angles, forming with sides of base a continuous curve to produced part, where there is an evident sinuation, front angles minutely dentate, hind angles each with a small, but sharp tooth; median line and front transverse impression rather shallow, latter deeper at sides and joined by the fairly deep longitudinal striæ, which extend all along front margin, basal foveæ just visible, vaguely transversely striate and with a few inconspicuous granules. *Elytra* with parallel sides, a little contracted close to base, not sensibly wider than prothorax, not quite twice as long as wide, base very slightly and minutely granulate, hardly emarginate, its sides sloping very gently back to shoulders, which have each a small obtuse tooth; striæ just visible and minutely punctate, not impressed, outer ones sometimes obsolete; intervals quite flat, 3 with from one to four pores, the front one, when present, placed at basal third, the apical pore wanting, marginal channel rather wide, finely granulate; surface shiny, but covered with minute irregular striæ, slightly shagreened near apex, where some microsculpture can also be traced. *Sternum*: sides of pro- and mesosterna, with their episterna, granulate; sides of metasternum finely punctate, the episterna nearly smooth, two and a half times as long as wide. *Legs*: protibiæ with 4 or 5 denticulations above the upper tooth; mesotibiæ with two stout spurs; metatibiæ with a fringe of ten or a dozen long setæ.

Length, 45–57 mm.

ASSAM: Dejoo, North Lakhimpur, at base of hills (*H. Stevens*); Manipur (*Doherty*—Brit. Mus.). BURMA: Tenasserim (Brit. Mus.); Moulmein and Tavoy (Ind. Mus.).

Type in Mr. René Oberthür's collection.

This species, the largest known in the genus, will easily be recognised by its size and very smooth elytra. Chaudoir did not know whence his specimen came, but I have seen and compared with it an example from Assam, so that there is no doubt about the identification. It is on this example, the largest I have seen and with very well-developed mandibles, that the above description has been prepared; in the type the prothorax is relatively wider and the base is not produced.

In small examples, in addition to the modified form of the mandibles, there is usually only one pore present on each elytron at about a fifth from apex, but there is no constancy in the number even in large specimens, so that I have not attempted to differentiate any varieties. The larger specimens which I have seen came from Assam, the smaller ones from Burma.

132. **Scarites orthomus**, *Chaud.* [Fig. 39 (23).]

Scarites orthomus, Chaudoir*, Bull. Mosc. 1855, i, p. 55; id. Mon. p. 88.

Head wide, lateral truncature not emarginate, preocular angle not projecting laterally, frontal impressions rather shallow, the whole surface covered with coarse, rather wavy, longitudinal striæ, which disappear near front angles and on neck, which is very wide; mandibles rather longer than head, strongly curved and coarsely striate, median carina unusually short, moderately sinuate, as is also, to some extent,

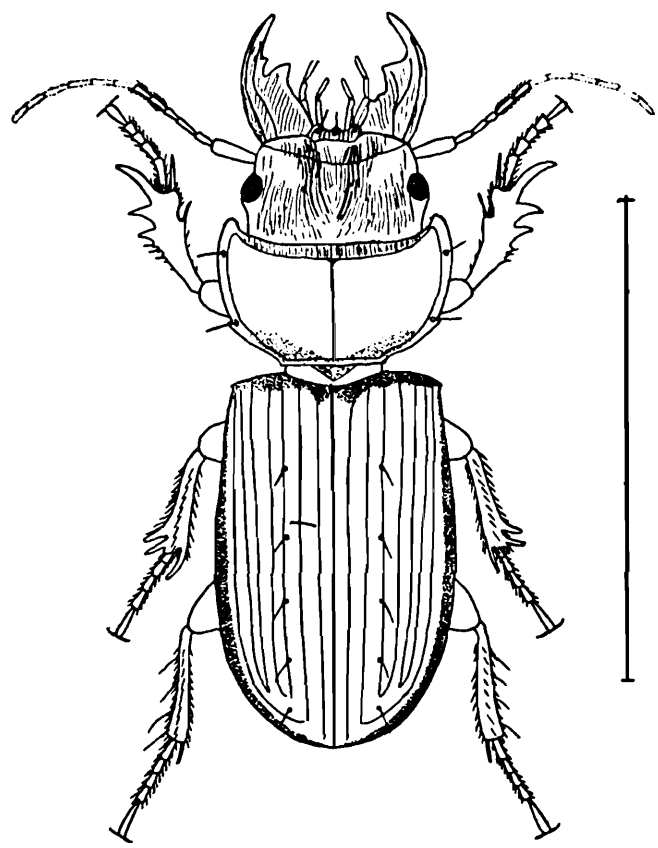


Fig. 41.—*Scarites orthomus*, Chaud.

the outer carina bounding the scrobe, left mandible with basal tooth emarginate, the hind cusp trifid and at a much lower level than the front one, another tooth in front, not far from the basal one, right mandible with two teeth, the basal one trifid; eyes rather flat and hardly projecting beyond the genæ, which are small and inconspicuous, or beyond the neck; antennæ filiform, extending well beyond hind angles of prothorax, joint 1 unusually long and equal to the next 4 taken together, 5 to 10 fully twice as long as wide; mentum asperate-striate, vaguely bordered at sides; paragenæ without internal emargination and only a rudimentary tooth. *Prothorax* wide, cyathiform, a third wider than head and a half wider than long, base with the median part moderately produced

and less than half as wide as apex, which is widely and deeply emarginate, front angles widely rounded and somewhat distant from neck, sides bisetose, slightly crenulate in front, explanate near front angle, forming with sides of base a continuous curve to the produced part behind, interrupted only by the sharp tooth at hind angles ; median line fine, front transverse impression rather shallow, a little deeper at sides than in middle, basal foveæ just visible, both transversely striate and granulate, a faint line of granules extending along both the basal and lateral channels, front margin rather closely longitudinally striate. *Elytra* wide, moderately dilated behind, as wide as prothorax and two-thirds longer than wide, base rather slightly emarginate at middle, sides straight, sloping very gently to shoulders, which bear each a small but sharp tooth ; striæ moderately deep, impunctate, only disappearing quite close to apex, 4 bent a little outwards at base ; intervals moderately convex, outer ones with a row of granules along each margin, 3 with four or five pores ; surface with some fine irregular striæ, a little shagreened, but shiny on disk, dull at sides and apex, with some vague microsculpture, a few granules at sides and near apex. *Sternum* : episterna and sides of sterna more or less granulate, metepisterna twice as long as wide. *Legs* : protibiæ with 4 or 5 denticulations above the upper tooth ; mesotibiæ with two stout spurs ; metatibiæ with an outer fringe of 8 or 10 long setæ.

Length, 34–44 mm.

ASSAM (*Dr. Schlich*—Ind. Mus.). BENGAL (Brit. Mus.). BHUTAN (*Capt. Pemberton*—Brit. Mus.). BIHAR : Pusa (Pusa Coll.).

Type in Mr. René Oberthür's collection. This was said to come from the Himalayas.

The large size and unusual width of this species, along with the rounded, explanate front angles of the prothorax, will render it easily recognizable. At present very few specimens are known.

133. Scarites terricola, *Bon.*

Scarites terricola, Bonelli *, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 471 ; Dejean, Spec. Gen. i, 1825, p. 398; Dejean et Boisduval, Icon. et Hist. Nat. i, 1830, t. 21. f. 5 ; Bedel, Cat. rais. Col. N. Afr. 1895, p. 42 ; Tchitcherin, Rev. Russ. Ent. 1904, p. 264 ; Andrewes, Ann. Mus. Civ. Gen. xlix, 1922, p. 391.

Scarites arenarius, Bonelli *, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 472 ; Dejean, Spec. Gen. i, 1825, p. 396 ; Dejean et Boisduval, Icon. et Hist. Nat. i, 1830, t. 21. f. 4 ; Brullé in Audouin et Brullé, Hist. Nat. Ins. v, 1835, p. 57 ; Chaudoir, Mon. p. 100 ; Bates, Scientific Results of Second Yarkand Mission, 1891, Col. p. 4 ; Reitter, Best. Tab. p. 7 ; Andrewes, Ann. Mus. Civ. Gen. xlix, 1922, p. 392.

Scarites volgensis, Fischer, Ent. Russ. ii, 1824, p. 31, t. 26. f. 3.
Scarites lævigatus, Fischer (not F.), Ent. Russ. iii, 1828, p. 122.
Scarites persicus, Chaudoir *. Bull. Mosc. 1842, ii, p. 813.
Scarites compressus, Coquerel, Ann. Soc. Ent. Fr. 1858, p. 758; de la Brûlerie, Ann. Soc. Ent. Fr. 1875, p. 127 (note 13).
Scarites pacificus, Bates *, Trans. Ent. Soc. Lond. 1873, p. 238; Putzeys, Compt. rend. Soc. Ent. Belg. 1875, p. 49; Heyden, Deutsch. Ent. Zeitschr. 1879, p. 329; Chaudoir, Mon. p. 101; Lesne, Miss. Pavie Hist. Nat. 1904, p. 63; Dupuis, Ann. Soc. Ent. Belg. 1913, p. 81.

Head with the lateral truncature not, or only lightly emarginate, preocular angle not projecting laterally, frontal impressions moderately deep, surface very variable, but generally more or less covered by fine striæ and finely punctate behind; mandibles about as long as head, finely striate, the median carina gently curved, left mandible with basal tooth deeply emarginate, the hind cusp bifid, another small tooth towards apex, right mandible with the basal tooth raised and two or three small cusps beneath it, the carina on it not joining central one or reaching base; eyes moderately prominent, genæ short, not very conspicuous and sloping gradually to neck; antennæ not reaching hind angles of prothorax, joints 5 to 10 as wide as long. *Prothorax* about a fifth wider than head and as much wider than long, base not produced, its sides straight, front angles inconspicuous, though not much rounded, sides bisetose, nearly straight, but curving inwards to front angles, a small tooth at each hind angle; median line rather fine, front transverse impression deep and not shallower at middle, basal foveæ rather more evident than usual, but only indistinctly granulate. *Elytra* slightly dilated behind, hardly wider than prothorax and twice as long as wide, sides of base curving gently back to shoulders, which are obtusely and minutely dentate; striæ fairly deep and usually finely punctate, 5 and 6 bent outwards and a little deeper than the others near base; intervals moderately convex, without granulation along margins, 3 with two pores, at about apical third and close to apex; surface smooth, uniform, covered by a microsculpture, which is more clearly visible in the striæ than on the intervals, and extends to the base of the prothorax. *Sternum*: episterna and sides of sterna more or less granulate, metepisterna quite twice as long as wide. *Legs*: protibiæ with 1 or 2 denticulations above upper tooth; mesotibiæ with a single spur.

Length, 15–20 mm.

BALUCHISTAN: Seistan (*McMahon*); Nushki district (*E. Vredenburg*); Baluchistan-Afghanistan Boundary Commission. All in the Indian Museum.

Types of *terricola* and *arenarius* in the Turin Museum; those of *volgensis* and *lævigatus* not traced; that of *persicus*

in Mr. René Oberthür's collection; that of *compressus* in the Paris Museum; that of *pacificus* in the British Museum.

This extremely variable species occurs throughout the palæarctic region from France to Japan, including on the south Northern Africa, Asia Minor, and Persia. Chinese and Japanese specimens generally have the head smoother, with fewer striæ, and often impunctate behind, the striæ of the elytra either impunctate, or only indistinctly punctate. This is the form described by Bates as *pacificus*.

The specimen from Barkuda Island in Lake Chilka, which I formerly determined as *terricola*, is actually an aberrant form of *indus* (see under that species).

134. **Scarites subcylindricus**, *Chaud.*

Scarites subcylindricus, Chaudoir*, Bull. Mosc. 1843, ii, p. 730; id., Bull. Mosc. 1855, i, p. 85; id., Mon. p. 101; Andrewes, Ent. Mitt. 1927, p. 143.

Scarites longipennis, Chaudoir, Bull. Mosc. 1855, i, p. 84.

Scarites arenarius var. *subcylindricus*, de la Brûlerie, Ann. Soc. Ent. Fr. 1875, p. 127.

Scarites semicylindricus, Reitter, Best. Tab. eur. Col. xxxix, Scaritini, 1899, p. 7. (This name seems to be due to an inadvertence.)

This species is very closely related to *terricola*, but is a little smaller and narrower, with more parallel sides. The head hardly differs in form, but is more evidently punctate behind; the prothorax is very little wider than long, the hind angles more obtuse, and the tooth smaller; the elytra have rather more parallel sides, similarly punctate-striate, but with three, four, or (according to Chaudoir) sometimes five pores on interval 3.

Length, 13–17 mm.

BALUCHISTAN: Baluchistan-Afghanistan Boundary Commission (Ind. Mus.). EGYPT. SYRIA. ARABIA. IRAK.

Types of both *subcylindricus* and *longipennis* in Mr. René Oberthür's collection.

Reitter mentions two specimens from Andalusia in his collection; I have not seen these, but suspect that they will prove to be a form of *terricola*. I have in my collection an example nominally from Koraput (Madras), which belongs to this species, but must, I think, be wrongly labelled.

135. **Scarites indus**, *Oliv.*

Scarites indus, Olivier, Ent. iii, 36, 1795, p. 9, t 1. f. 2; Dejean, Spec. Gen. i, 1825, p. 395; Chaudoir, Bull. Mosc. 1855, i, p. 84; id., Mon. p. 102; Redtenbacher in Reise Novara, Zool. ii, 1867, Col. p. 8; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72; id., Entom. 1891, Suppl. p. 8; id., Compt. rend. Soc. Ent. Belg. 1891, p. 325; Heyne-Taschenberg, Die Exotischen Käfer, 1894,

t. 3. f. 33, and 1895, p. 20; Fletcher, Agr. Res. Ins. Pusa, Bull. 89, 1919, p. 33, f. 25 (biology); Andrewes, Rec. Ind. Mus. xxii, 1921, p. 340; id., Ann. Mus. Civ. Gen. xlix, 1922, p. 391; id., Trans. Ent. Soc. Lond. 1924, p. 462; id. in Mission Babault Ind. Carab. 1924, p. 10.

Scarites mancus, Bonelli*, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 473; Dejean, Spes. Gen. i, 1825, p. 394; Chaudoir, Bull. Mosc. 1855, i, p. 83; id., Mon. p. 102; Andrewes, Ann. Mus. Civ. Gen. xlix, 1922, p. 392.

Scarites terricola, Andrewes (not Bon.), Rec. Ind. Mus. xxii, 1921, p. 339.

Another close ally of *terricola*, differing principally in its shorter and wider form, and in the presence of an additional pore on the third interval of the elytra at about basal fourth, occasionally with a fourth pore just behind middle. *Head*

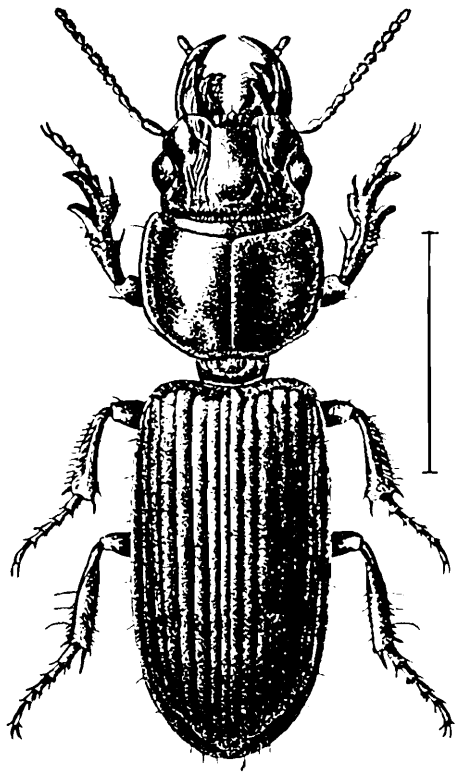


Fig. 42.—*Scarites indus*, Oliv. (After Fletcher.)

with the preocular angle projecting a little laterally and therefore more conspicuous, surface on average similarly striate, but less punctate behind, often impunctate. *Prothorax* a little wider, apex less emarginate, the front transverse impression shallower and rather further from margin. *Elytra* with more rounded sides, evidently less than twice as long as wide, the striæ shallower, and either smooth (*mancus*), or at most lightly punctate (*indus*). This last character differentiates the species at once from the typical European form of *terricola*, in which the striæ are very clearly punctate, though not from the East Asian form, to which it is more nearly akin.

Length, 16–22 mm.

INDIA. CEYLON.

Type not identified with certainty, though possibly it is one of three very old specimens in the Paris Museum ; that of *mancus* in the Turin Museum.

This is one of the commonest insects throughout British India and Ceylon, the habitat extending northwards to Kashmir, Nepal, Sikkim, and Assam ; I have seen no examples from any locality outside these limits. Independently of places mentioned by other authors where examples have been taken, I have something like a hundred localities recorded in my own notes, which it seems unnecessary to print here. The specimen from Barkuda Island in Lake Chilka, formerly referred by me to *terricola*, actually belongs to this species, but it is an aberration—the only one I have seen—in which the front pore on interval 3 is wanting. The specimen taken by Mr. Maindron at Pondicherry, and referred by Mr. Lesne (Miss. Pavie Hist. Nat., 1904, p. 63) to *pacificus*, Bates, is probably in the same category.

Facing page 33 of Mr. Fletcher's ' Second Hundred Notes on Indian Insects ' are figures of the imago of this species and also of the pupa (lateral and ventral views). Mr. Fletcher, writes : " No detailed description of the larva was made, but it was very similar in appearance to the larva of *Calosoma indica*, but the anal cerci were provided with small joints and with brown hairs arising from these joints, as well as from the tips of the cerci." An example, now in the Pusa collection, was taken at Bankura in Bengal " eating white ants in the nest."

136. **Scarites subnitens**, *Chaud.*

Scarites subnitens, Chaudoir *, Bull. Mosc. 1855, i, p. 87 ; id., Mon. p. 103.

Head with lateral truncature slightly emarginate, preocular angle not projecting laterally, frontal impressions moderately deep, finely striate on their outer side, the striæ generally carried forward on the clypeus, some more evident striæ near eyes and a few vague ones across neck ; mandibles as long as head, smooth except for a little striation on the basal tooth of left one, median carina gently curved, basal tooth in both mandibles irregularly jagged, the carina on front tooth not joining central one, or reaching base ; eyes with genæ rather prominent, latter shorter than and not projecting as far laterally as eyes, but contracted sharply to neck ; antennæ moniliform, barely reaching hind angles of prothorax, joints 5 to 10 as wide as long ; mentum uneven but nearly smooth, its sides narrowly bordered. *Prothorax* slightly wider than head and also a little wider than long, base not produced at middle, its sides straight, front angles projecting a little forwards,

sides bisetose, nearly straight, a little rounded close to front and hind angles, latter dentate; median line and front transverse impression not very deep, latter a little deeper near the angles and minutely crenulate, basal foveæ just visible and faintly granulate. *Elytra* with parallel sides, only faintly contracted near base, as wide as prothorax and fully twice as long as wide, sides of base only sloping backwards close to shoulders, which are sharply dentate; striæ fine and shallow, minutely and often indistinctly punctate, 5 and 6 bent a little outwards and also a little deeper just behind shoulder; intervals only slightly convex, without granulation, 3 with three pores; surface smooth and shiny, with a microsculpture which in front is visible only in the striæ. *Sternum*: sterna practically smooth, metepisterna more than twice as long as wide. *Legs*: protibiæ with two very small denticulations above upper tooth; mesotibiæ with a single spur.

Length, 13–14 mm.

BENGAL. BIHAR: Pusa. UNITED PROVINCES: Garhwal, Jumnagwar and Dhikala; Bijnor, Bhogpur; Naini Tal, Kaladhungi (*R. Hodgart*); Haldwani, Bodiar (*H. G. Champion*); Siwalik Hills, Asan, Jumna River (*C. F C. Beeson*); Dehra Dun, Kulhal; Chakrata, Kathian. CENTRAL PROVINCES: Lalitpur. BURMA: Tharrawaddy (*G. Q. Corbett*).

Type in Mr. René Oberthür's collection.

137 **Scarites punctum**, *Wied.* [Fig. 38 (7).]

Scarites punctum, Wiedemann *, Zool. Mag. ii, 1, 1823, p. 38; Chaudoir, Bull. Mosc. 1855, i, p. 109; id., Mon. p. 127; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 162; id., Trans. Ent. Soc. Lond. 1921, p. 168.

Scarites opacus, Chaudoir *, Bull. Mosc. 1855, i, p. 88; id., Mon. p. 103; Bates, Entom. 1891, Suppl. p. 8; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 167

Head with lateral truncature straight, preocular angle not projecting laterally, frontal impressions moderately deep, the whole surface finely striate, very irregularly behind, basal half also finely punctate, a slight depression along the course of the clypeal suture; mandibles slender, as long as head, finely striate, median carina faintly sinuate at basal third, basal tooth in both mandibles more or less bifid, hind cusp of the right one raised, much larger than front cusp, the carina very short; eyes rather flat, genæ inconspicuous; antennæ moniliform, barely reaching hind angles of prothorax, evidently dilated towards extremity, joints 5 to 10 about as long as wide; mentum faintly striate, the sides finely bordered. *Prothorax* a fifth wider than head but only a trifle wider than long, base not produced at middle, its sides straight, front

angles fairly sharp and slightly advanced, sides bisetose, nearly straight, parallel, curving inwards a little in front and behind, hind angles each with a small tooth ; median line fine, front transverse impression subcrenulate, moderately deep, hardly deeper at sides, basal foveæ obsolete, their site hardly perceptibly granulate, surface covered with very faint wavy striæ, some evident longitudinal striation along front margin. *Elytra* with sides nearly parallel, but very gently contracted in front, barely wider than prothorax and twice as long as wide, sides of base sloping gently back to shoulders, which are minutely but sharply dentate ; striæ very fine, hardly impressed and formed chiefly by minute punctures, 7 obsolete ; intervals flat, 3 with three very conspicuous pores ; surface

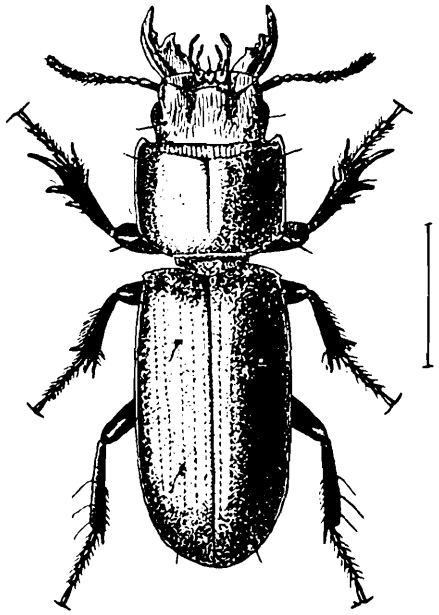


Fig. 43.—*Scarites punctum*, Wied.

dull, with a very clear microsculpture, which covers elytra and prothorax and extends to, though it is less visible on head. *Sternum* : episterna and sides of sterna vaguely rugose-granulate, metepisterna more than twice as long as wide. *Legs* : protibiæ with a single denticulation above upper tooth ; mesotibiæ with only one spur.

Length, 11·5–14 mm.

NEPAL (Brit. Mus.). ASSAM (*Jenkins*—Oxford Univ. Mus.) ; Patkai Mountains. BENGAL : Malda. BIHAR : Pusa (*G. D. Austin*) ; Chapra (*Mackenzie*). UNITED PROVINCES : Hardwar and Roorkee (*J. Wood Mason*—Ind. Mus.) ; Naini Tal, Boxar (*R. Hodgart*) ; Almora, Ranikhet, and Tanakpur (*H. G. Champion*) ; Kali Valley and Thal (*R. N. Parker*) ; Mothronwala (*M. Cameron*) ; Dehra Dun. PUNJAB : Akalgarh ; Kulu.

Type in the Copenhagen University Museum; that of *opacus* in Mr. René Oberthür's collection.

This and *subnitens* are the two smallest Indian species in the genus, but are not likely to be confused, if only on account of the character of their upper surface, dull in *punctum* and shiny in *subnitens*.

138. **Scarites guineensis**, *Dej.* [Fig. 38 (4).]

Scarites guineensis, Dejean, Spec. Gen. v, 1831. p. 484; Chaudoir, Bull. Mosc. 1855, i, p. 59; id., Mon. p. 107.
Scarites asphaltinus, Klug in Symbol. Phys. Decas iii, 1832, t. xxiv. f. 1.
Scarites nitidus, Chaudoir, Bull. Mosc. 1843, ii, p. 722.
Scarites boysi, Chaudoir*, Bull. Mosc. 1855, i, p. 57; id., Mon. p. 107; Andrewes, Ann. Mag. Nat. Hist. (10) ii, 1928, p. 586.
Scarites rocheti, Chaudoir, Bull. Mosc. 1855, i, p. 58.

Head with the lateral truncature moderately emarginate, preocular angle conspicuous and projecting laterally, frontal impressions moderately deep, sides of front and clypeus, together with an area round eyes, coarsely but not very deeply striate; mandibles shorter than head, striate, the median carina strongly sinuate at about basal third, left mandible with a wide basal tooth, faintly emarginate, the front cusp very blunt, the tooth nearer apex only just indicated, right mandible with the basal tooth more or less trifid; eyes small and flat, genæ shorter than eyes, but usually projecting a little further laterally and contracting fairly sharply to neck; antennæ not reaching hind angles of prothorax, joints 5 to 10 half as long again as wide; mentum rugose-striate, its sides narrowly bordered. *Prothorax* a fourth wider than head, two-thirds wider than long, base produced at middle, its sides very nearly straight, front angles not projecting, sides gently rounded, rather strongly near front angles, a tooth and seta at hind angles; median line fine, front transverse impression faint at middle, deep at sides, basal foveæ just visible, slightly granulate. *Elytra* ovate, rounded at apex, evidently dilated behind and widest rather behind middle, as wide as prothorax and three-fifths longer than wide, sides of base curving backwards to shoulders, which are dentate; striæ impunctate, rather shallow on disk, deep at sides, disappearing close to apex; intervals moderately convex on disk and distinctly so at sides, without granulation, 3 impunctate, though sometimes with a single indistinct pore near apex. No microsculpture. *Sternum*: proepisterna slightly granulate, metepisterna half as long again as wide. *Venter* with the apical segment bipunctate on each side. *Legs*: protibiæ with 4 or 5 denticulations above upper tooth; mesotibiæ with two spurs;

metatibiæ with a fringe of about half a dozen long setæ along outer margin.

Length, 29–34 mm.

ASSAM: Sibsagar (Ind. Mus.). DELHI (*C. R. Cooke*). BOMBAY: Karachi (Brit. Mus.); Poona (Oxford Univ. Mus.). "N.W. India" (Brit. Mus.). ARABIA. SUDAN. ABYSSINIA. SENEGAL.

Type, together with the types of Chaudoir's three species, in Mr. René Oberthür's collection; that of *asphaltinus* is no doubt in the Berlin Zoological Museum. It is due to the quite recent identification of the Indian with the African species that I have seen only one of the five types.

In his Monograph Chaudoir differentiates *boysi* and *guineensis* separately from *striatus*, Dej., another African species, but says nothing of their relations *inter se*, while the distinguishing characters given are somewhat similar for the two species. *S. striatus* is larger and sufficiently distinct from the other two, which appear to me to be identical, though in the few examples of *boysi* which I have seen the tooth on each side at the hind angles of the prothorax seems rather more developed. Chaudoir tells us that *guineensis* is met with in Arabia, which is confirmed by an example so labelled in the British Museum, and, as quite a number of species are common to the sandy waste extending from North-East Africa to Sind, there is nothing surprising in its occurrence at Karachi or even at Delhi, but Assam is a far cry and confirmation is needed here, as also in the case of Poona.

139. **Scarites cycloderus**, *Chaud.* Fig. 39 (17).]

Scarites cycloderus, Chaudoir *, Mon. p. 112.

Head with the lateral truncature emarginate, the preocular angle projecting a little laterally, frontal impressions short and only moderately deep, their outer sides and the sides of the clypeus coarsely striate; mandibles quite as long as head, coarsely striate, the median carina strongly sinuate at about basal third, left mandible with basal tooth large but not emarginate, the tooth generally present nearer apex obsolete, right mandible with basal tooth raised, separated from the second tooth, which is smaller, blunt, and without carina, by a deep emargination; eyes small, largely enclosed by the genæ, which are as long as eyes, project considerably further laterally, contract sharply to neck, and are separated on each side from the eye by a shallow groove, another groove running along the inner margin of both eye and gena; antennæ fairly stout, not quite reaching hind angles of prothorax, joints 5 to 10 as wide as long; mentum finely granulate, its sides

narrowly bordered. *Prothorax* a little wider than head and not quite a half wider than long, base hardly produced at middle, though its sides, which are nearly straight, are slightly sinuate on each side close to the median part, front angles minutely dentate, sides bisetose, gently rounded, hind angles with a scarcely perceptible tooth ; median line very fine, front transverse impression obsolete at middle, deep at sides, basal foveæ just visible, granulate, front margin longitudinally striate. *Elytra* subovate, evidently dilated behind, barely wider than prothorax, quite two-thirds longer than wide, sides of base curving rather sharply backwards to shoulders, which have each a well-marked tooth ; inner striæ shallow, finely and vaguely punctate, outer ones forming fairly wide grooves, which at bottom are shagreened ; intervals moderately convex on disk and behind, 6 to 8 narrowed and convex, almost carinate in front, 7 reaching shoulder, 8 not quite doing so, and both overhanging the lateral border, so that from above the visible margin has a crenulate appearance, 3 without pores, surface smooth in front, densely and finely rugose on apical third. No evident microsculpture. *Sternum* : proepisterna subgranulate, sterna otherwise smooth ; metepisterna about two-thirds longer than wide. *Legs* : protibiæ with 4 or 5 blunt denticulations above upper tooth ; mesotibiæ with two spurs.

Length, 30–38 mm.

SIKKIM : Pedong (*Desgodins*).

Type in Mr. René Oberthür's collection. This was said to come from the " Indes Orientales."

I have seen only two examples, viz., the type and a specimen from Pedong presented to me by Mr. Oberthür. The former is not in good condition, while in the latter not only is the abdomen missing, but there are only two legs left. Nevertheless, as my specimen agrees well with the description and with my notes on the type, I have drawn up the above description mainly on the characters which it presents, for Chaudoir does little more than compare the Indian species with an African one. In the type the front transverse impression of the prothorax is apparently much deeper in the middle and the tooth at hind angles more evident than in the example described.

140. **Scarites nitens**, sp. nov. [Fig. 39 (14).]

Head with lateral truncature deeply emarginate, preocular angle right and projecting laterally, frontal impressions fairly deep, with clypeus and a small area on each side near eye moderately striate ; mandibles hardly as long as head, the striation chiefly on basal teeth, the median carina blunt,

rather strongly sinuate at a third from base, disappearing at about middle, left mandible with basal tooth wide, emarginate, somewhat dilated in front, the tooth nearer apex minute, right mandible with basal tooth raised, more or less trifid, separated from front tooth by a wide emargination; eyes flat, genæ projecting just beyond them and sloping rather gradually to neck; antennæ slender, reaching hind angles of prothorax, joints 5 to 10 quite half as long again as wide; mentum rather vaguely granulate-striate, its sides narrowly bordered. *Prothorax* a fourth wider than head and a half wider than long, strongly contracted behind, base produced

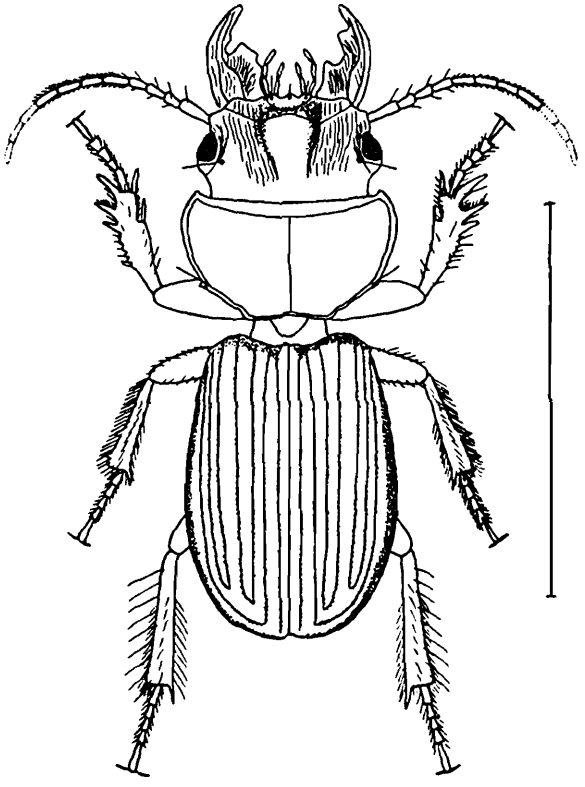


Fig. 44.—*Scarites nitens*, Andr.

at middle, its sides straight, front angles a little rounded, not produced, sides strongly rounded close to front angles, and at once sharply contracted to base, lateral channel wider in front than behind, a seta and fairly large tooth at hind angles; median line fine, front transverse impression rather faint at middle, deep and wide at sides, basal foveæ obsolete, surface with some vague longitudinal striæ along front margin, one or two transverse striæ in front and at sides of base. *Elytra* ovate, rounded at apex, rather strongly dilated behind and widest rather behind middle, slightly wider than prothorax, and nearly two-thirds longer than wide, sides of base sloping backwards, shoulders dentate; striæ very finely crenulate,

moderately deep on disk, deeper at sides; intervals without granulation along margins, slightly convex on disk, distinctly so at sides, especially behind shoulders, where 7 and 8 have one or two coarse granules on their inner margins, 3 with a single pore close to apex, surface smooth and shiny, without microsculpture. *Sternum*: sterna smooth and shiny; metepisterna about two-thirds longer than wide. *Venter* with segments bipunctate, apical one bipunctate on each side. *Legs*: protibiæ with 7 or 8 denticulations above upper tooth; mesotibiæ with two spurs; metatibiæ with a row of some 20 long setæ fringing outer margin.

Length, 38–46 mm.

BALUCHISTAN: Baluchistan-Afghanistan Boundary Commission (Ind. Mus.).

Type in the Indian Museum, Calcutta; cotypes in my collection.

The species is closely allied to both *S. turkestanicus*, Heyd. (Deutsch. Ent. Zeitschr., 1884, p. 219), confined apparently to Turkestan, and *S. striatus*, Dej. (Spec. Gen. i, 1825, p. 371) of the North African littoral. It differs from the former in the character of the elytra, which are more widely dilated behind, with relatively deep striation, a very shiny surface, and an apical pore on interval 3 (though this is occasionally present in *turkestanicus*). From *striatus*, in which the striation of the elytra is almost exactly similar, it differs in its larger size, bigger head, rather longer elytra, and the fringe of numerous long hairs on the metatibiæ. It differs from both in the form of the prothorax, which is sharply contracted from a point on each side very near front angles.

141. **Scarites crassus**, sp. nov. [Fig. 39 (18).]

Head with the front angles more rounded than truncate, the preocular angle not projecting laterally, frontal impressions very shallow, clypeal suture fine, the area surrounding it somewhat depressed, surface densely and very finely striate-punctate, the punctures less noticeable in front and the striæ disappearing on neck, a small punctiform impression behind inner margin of eye; mandibles hardly as long as head, rather deeply and almost longitudinally striate, median carina gently curved, left mandible with basal tooth emarginate, front tooth minute, right mandible with the basal tooth raised and blunt, the carina usually joining the median carina to apex of front tooth originating here at base; eyes small and rather flat, enclosed behind by genæ, which are as long as eyes, project a little further, and contract fairly sharply to neck; antennæ submoniliform, barely reaching hind angles of prothorax, joints 5 to 10 very little longer than wide;

mentum finely granulate, with a fairly wide border on each side, the inner margin of which is almost carinate. *Prothorax* a fifth wider than head and as much wider than long, only slightly contracted behind, widest near front angles, base not produced, front angles hardly projecting, but not rounded, sides bisetose, a little rounded near the angles only, hind angles moderately dentate; median line fine, front transverse impression moderately deep, finely crenulate, basal foveæ just visible, granulate, the granulation extending along basal and lateral channels, surface finely rugose-punctate near base and within the front angles. *Elytra* evidently dilated behind, hardly wider than prothorax, not quite twice as long as wide, sides of base curving gently back to shoulders, which are sharply dentate; striæ finely but distinctly impressed, fairly deep at sides, impunctate; intervals moderately convex, more so at sides, finely though not very conspicuously granulate along margins, 3 with four pores; surface nearly smooth in front, minutely rugose-punctate on apical third, without any evident microsculpture. *Sternum*: episterna and sides of sterna granulate, metepisterna two-thirds longer than wide. *Venter* densely and very finely rugose-punctate, segments bipunctate, apical one bipunctate on each side, front margin of last three segments crenulate. *Legs*: protibiæ with 6 denticulations above upper tooth; mesotibiæ with two spurs, the upper one very small; metatibiæ with a fringe of only 5 or 6 long hairs.

Length, 26 mm.

BOMBAY: Belgaum (*H. E. Andrewes*), a solitary example taken about June.

Type in my collection.

The species stands rather alone, but shows some affinity with the last group (*guineensis*, etc.), for the metepisterna are evidently less than twice as long as wide, and the elytra are more dilated behind than in the species of the earlier groups.

142. **Scarites planus**, *Bon.*

Scarites planus, Bonelli, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 470; Dejean, Spec. Gen. i, 1825, p. 395; Dejean et Boisduval, Icon. et Hist. Nat. i, 1830, t. 21. f. 3; Ménétriés, Cat. rais. Cauc. 1832, p. 103; Andrewes, Ann. Mus. Civ. Gen. xlix, 1922, p. 391.

Scarites nitidus, Dejean *, Spec. Gen. v, 1831, p. 484; Chaudoir, Mon. p. 55.

Scarites punctatostriatus, Redtenbacher in Russegg. Reise, 1843, p. 979.

Tæniolobus planus, Chaudoir, Bull. Mosc. 1855, i, p. 46.

Scarites bisquadripunctatus, Klug * in Peter's Reise Mossamb. Zool. v, 1862, p. 158; Chaudoir, Mon. p. 55; Reitter, Best. Tab. p. 8; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 101.

Distichus planus, Chaudoir, Mon. p. 53; Reitter, Best. Tab. p. 8; Tchitcherin. Rev. Russ. Ent. 1904, p. 265; Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470; id., Rec. Ind. Mus. xviii, 1919, p. 99; id., Trans. Ent. Soc. Lond. 1921, p. 146.

Head with the front angles neither emarginate nor projecting laterally, clypeus emarginate at middle, with a small tooth on each side of labrum, the emargination with two very small blunt teeth at middle, frontal impressions wide, fairly deep, and moderately striate, the striæ extending to clypeus and to the sides behind, neck rather coarsely punctate; mandibles striate, median carina gently curved, basal tooth jagged in both, front tooth in left mandible very slight, right mandible with the carina on front tooth not joining median carina; eyes rather flat, enclosed behind by genæ, which are visible but not very conspicuous; antennæ moniliform, nearly reaching hind angles of prothorax, joints 5 to 10 longer than wide; mentum striate, with longitudinal carinæ on tooth and at sides. *Prothorax* about a fifth wider than head and a fourth wider than long, base slightly produced at middle, front angles not projecting, but not much rounded, sides bisetose, nearly straight, forming with sides of base a regular curve, interrupted only by the slight tooth at hind angles; median line only moderately deep, front transverse impression rather deeper, crenulate, basal foveæ obsolete, sides of base finely punctate-granulate, surface generally with some cross-striation. *Elytra* somewhat flat, slightly dilated behind, as wide as prothorax and a little less than twice as long as wide, sides of base curving gently to shoulders, which bear each a small but very sharp tooth; striæ rather closely punctate, wide but not deep, except behind shoulder; intervals rather flat, 6 and 7 convex and a little narrowed just behind shoulder, 3 with four (more rarely three or five) pores; surface uniformly smooth and shiny, with scarcely visible microsculpture. *Sternum*: episterna and sides of sterna finely punctate, metepisterna more than twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with two or three denticulations above upper tooth; mesotibiæ with a single spur.

Length, 12·5–17 mm.

Baluchistan: Seistan, Lab-i-Baring, "under drift at edge of Hamun" (Ind. Mus.). Persia. Irak. Arabia. Syria. Mediterranean and Caspian basins. Egypt. Sudan. Abyssinia. East Africa.

Type lost; that of *nitidus* in Mr. René Oberthür's collection; that of *punctatostriatus* in the Vienna Museum; that of *bisquadripunctatus* in the Berlin Zoological Museum.

Chaudoir in his Monograph mentions a specimen taken by Capt. Boys in India; I examined this and formed the opinion that it was an example of *puncticollis*. I have seen no specimen of *planus* from India.

143. **Scarites mahratta**, sp. nov.

Head with the front angles rounded and not projecting laterally, clypeus emarginate and with a fairly sharp tooth on each side of labrum, two small sharp teeth in the emargination, frontal impressions moderately deep, outwardly striate, the striation fairly deep, widening out behind, reaching neck, and covering the surface between the eyes, middle of front and a convex area on each side near front angles smooth, except for an almost microscopic puncturation, neck moderately constricted, the constriction finely and densely punctate; mandibles much shorter than head, very slightly striate, median carina gently curved, basal tooth in both rather jagged, front tooth in left mandible obsolete, right mandible with the carina on front tooth somewhat sinuate, not joining median carina; eyes rather flat, genæ evident, not quite as long as eye, but projecting nearly as far, sloping rather gradually to neck; antennæ hardly reaching hind angles of prothorax, dilated towards apex, at least joints 8 to 10 transverse; mentum obliquely striate, with longitudinal carinæ on tooth and at sides. *Prothorax* a little wider than head and about a fifth wider than long, base slightly produced or at least with an evident sinuation on each side of median part, apex only a little emarginate, front angles inconspicuous, sides bisetose, forming with sides of base a continuous curve, interrupted only by the slight tooth on each side at hind angle; median line moderately deep, front transverse impression deep, both subcrenulate, basal foveæ wanting, sides of base granulate-punctate, a few punctures extending forward on to disk. *Elytra* rather flat, very slightly dilated behind, as wide as prothorax and twice as long as wide, sides of base curving back to shoulders, which are rather sharply dentate; striæ deep, very clearly punctate, practically reaching apex, where they are almost as deep as in front; intervals moderately convex, 3 with three pores; surface shiny, with a faint microsculpture, which is indistinct even near apex. *Sternum*: episterna and sides of sterna finely and very closely punctate, metepisterna more than twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with two denticulations above upper tooth; mesotibiæ with a single spur.

Length, 10–12 mm.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*); Berar; Mandla (*N. C. Chatterjee*). BOMBAY: Belgaum (*H. E. Andrewes*—type); Kanara (*T. R. D. Bell*); Poona (*G. E. Bryant*).

Type in my collection.

There is in many respects a strong similarity between this species and *puncticollis*, from which, however, it will easily

be distinguished by the deep, punctate striæ and the practical absence of microsculpture.

In examples taken by Mr. F W Champion at Sardah (Bengal), and in others from Mahe (Malabar) and Southern Ceylon the striæ are less deeply impressed than in the typical form.

144. **Scarites picicornis**, *Dej.*

Scarites picicornis, Dejean *, Spec. Gen. v, 1831, p. 493.
Scarites troglodytes, Erichson * in Klug, Doubl. Verz. Senegall. Ins. Berlin, 1842, p. 4; id., Arch. Naturg. ix, 1843, p. 214; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 102.
Scarites minor, Nietner *, Journ. As. Soc. Beng. xxv, 1856, p. 389; id., Ann. Mag. Nat. Hist. (2) xix, 1857, p. 244; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 107.
Distichus picicornis, Chaudoir, Mon. p. 56.
Distichus minor, Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72.
Tæniolobus picicornis, Péringuey, Trans. S. Afr. Phil. Soc. vii, 1896, p. 398.

Head with the front angles truncate, the preocular angle not projecting laterally, clypeus emarginate at middle, with a short blunt tooth on each side of labrum, and with two small teeth in the emargination, frontal impressions elongate, fairly deep, linear, with a few striæ and punctures on each side between them and eye, the punctures sometimes extending vaguely across neck, which is faintly constricted; mandibles nearly as long as head, not striate, median carina gently curved, basal tooth a little jagged in both, front tooth in left mandible obsolete, the carina on front tooth of right mandible not joining the median carina; eyes moderately convex, genæ inconspicuous; antennæ not quite reaching hind angles of prothorax, dilated towards apex, with at least joints 8 to 10 transverse; mentum subrugose, with fine longitudinal carinæ on tooth and at sides. *Prothorax* about a fifth wider than head and as much wider than long, base not produced at middle, though the sides are a little sinuate close to the median part, front angles moderately sharp, sides nearly straight, bisetose, a minute tooth at each hind angle; median line rather fine, front transverse impression fairly deep, subcrenulate, basal foveæ wanting, sides of base with some very slight granulation. *Elytra* moderately convex, with nearly parallel sides, as wide as prothorax and about twice as long as wide, sides of base curving very slightly backwards, shoulders minutely dentate; striæ moderately impressed, finely and not very distinctly punctate; intervals moderately convex, 3 with four pores; surface shiny, with a microsculpture, which is distinct towards apex, but visible in front chiefly in the striæ. *Sternum*: proepisterna slightly granulate, metepisterna and sides of metasternum punctate, metepisterna more than twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate.

Legs: protibiæ with one denticulation above the upper tooth, mesotibiæ with a single spur, which is rather long and sharp.

Length, 9–10·5 mm.

BENGAL: Saidpur (*E. A. d'Abreu*); Dacca (*H. E. Stapleton*); Kumargaon (*M. Bose*). BIHAR: Purnea, Kierpur (*C. Paiva*). UNITED PROVINCES: Kheri Forest Division (*H. G. Champion*). CEYLON: Colombo (*G. Lewis*); Mamaduwa; Weligama. EAST AFRICA. SUDAN. ABYSSINIA. WEST AFRICA.

Type in Mr. René Oberthür's collection, where there is also a typical example of *minor*; type of *troglodytes* in the Berlin Zoological Museum.

A rather large, dull example, taken by Mr. George Lewis in Ceylon has very few punctures and striæ on the head, but it agrees in other respects with the typical form.

145. **Scarites laticeps**, sp. nov.

Distichus parvus, Andrewes (not Wied.) in Mission Babault Ind. Carab. 1924, p. 9.

Nearly allied to *picicornis*, but longer, and differing otherwise in the following particulars. *Head* more massive, the preocular angle projecting a little laterally, the left mandible with a distinct front tooth, right mandible with basal tooth trifid, eyes flatter and much more enclosed by the genæ, which are nearly as long as eye and project as far. *Prothorax* very little wider than head, but quite a fourth wider than long, median part of base a little produced and distinctly emarginate at middle, the front angles more rounded, the hind ones more evidently dentate. *Elytra* a little less convex and with slightly deeper striæ, the shoulders more distinctly dentate.

Length, 12–14 mm.

CENTRAL PROVINCES: Motinala, Majhgaon, and Mandla (*G. Babault*). MADRAS: Tenmalai (*N Annandale*).

Type in my collection.

146. **Scarites parvus**, *Wied.*

Scarites parvus, Wiedemann*, Zool. Mag. ii, 1, 1823, p. 37; Chaudoir, Mon. p. 103.

Distichus lucidulus, Chaudoir*, Mon. p. 57; Bates, Ann. Mus. Civ. Gen., xxxii. 1892, p. 271; Lesne, Miss. Pavie Hist. Nat. 1904, p. 63.

Scaritodes lucidulus, Vuillet, Insecta, ii, 1912, p. 17.

Distichus parvus, Andrewes, Trans. Ent. Soc. Lond. 1921, pp. 167 and 175.

Head with the front angles neither emarginate nor projecting laterally, clypeus emarginate at middle and with a short

blunt tooth on each side of labrum, two minute teeth in the middle of the emargination, frontal impressions moderately deep, externally striate, as are the sides behind and the sides of clypeus, middle of front and an area on each side near front angles convex and shiny, neck very faintly constricted, finely punctate, but with few or no punctures at middle (both striæ and punctures much fewer than in *puncticollis*); mandibles shorter than head, faintly striate, median carina gently curved, basal tooth jagged in both, left mandible with a very small front tooth, right mandible with the carina on front tooth very slight; eyes moderately prominent, genæ short but evident, contracting rather sharply to neck; antennæ barely reaching hind angles of prothorax, dilated towards apex, with at least joints 8 to 10 transverse; mentum very finely granulate-striate, with well-marked longitudinal carinæ on tooth and at sides. *Prothorax* a fifth wider than head and as much wider than long, base not produced at middle, front angles rather sharp, sides nearly straight, normally trisetose, one seta at hind angle and two near apex, but sometimes with four or five setæ, hind angles minutely dentate; median line fine, front transverse impression moderately deep, finely crenulate, basal foveæ wanting, basal area slightly and narrowly granulate-punctate. *Elytra* moderately convex, slightly dilated behind and a little pointed at apex, as wide as prothorax and twice as long as wide, sides of base curving very slightly backwards, a minute sharp tooth at each shoulder; striæ moderately deep, finely and indistinctly punctate; intervals moderately convex, 3 with four or five pores; surface shiny, with a faint but evident microsculpture, visible in front only in the striæ. *Sternum*: episterna and sides of sterna finely, closely, and confluently punctate, metepisterna more than twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with two denticulations above upper tooth, mesotibiæ with a single fine, sharp spur.

Length, 10·5–13 mm.

BENGAL: Dacca (*H. E. Stapleton*); Sunderbans (*F W Champion*); Sahibganj (*J Wood Mason*). ORISSA: Chandipur (*C. Dover*). BURMA: Rangoon (*G. Q. Corbett* and *L. Fea*); Tharrawaddy (*G. Q. Corbett*); Palon (*L. Fea*). SIAM. CAMBODIA.

Type in the Copenhagen University Museum; that of *lucidulus* in Mr. René Oberthür's collection.

147. **Scarites striaticeps**, *Chaud.*

Distichus striaticeps, Chaudoir *, Mon. p. 52.

Head with the front angles neither emarginate, nor projecting

laterally, clypeus emarginate at middle and with a short blunt tooth on each side of labrum, a depressed area on each side surrounding sides of clypeal suture, frontal impressions shallow, surface—including clypeus but excluding a small area on each side close to front angles—covered fairly closely with longitudinal striæ, neck slightly constricted, the constriction closely punctate, with the area behind it smooth; mandibles shorter than head, strongly striate, median carina curved, basal tooth jagged in both, front tooth in left mandible very slight, right mandible with the carina on front tooth apparently joining the median carina, though hardly distinguishable from the general striation; eyes moderately prominent, genæ shorter than eyes and not projecting so far laterally, contracting rather sharply to neck; mentum densely striate-granulate, a longitudinal carina along each side margin, the tooth slightly carinate. *Prothorax* a fifth wider than head and as much wider than long, base not produced, though its sides are slightly sinuate close to the median part, apex nearly straight, front angles inconspicuous and somewhat rounded, sides bisetose, very gently curved, hind angles dentate; median line fine, front transverse impression deep, crenulate, basal foveæ wanting, the whole basal area punctate-granulate, surface generally sparsely punctate. *Elytra* subdepressed, with parallel sides, as wide as prothorax and twice as long as wide, sides of base curving back to shoulders, which are slightly though sharply dentate; striæ finely punctate, moderately impressed, a little shallower towards apex; intervals slightly convex, 3 with four pores; surface uniformly smooth, a little dull, without evident microsculpture. *Sternum*: prosternum and episterna granulate, metasternum and episterna rugose-punctate, latter very narrow and more than twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with two denticulations above the upper tooth; mesotibiæ with a single spur.

Length, 12·5–14·5 mm.

BENGAL: Sahibganj (Ind. Mus.); Brahmaputra River, Goalundo—Gauhati (*T. B. Fletcher*—Pusa coll.). BURMA: Rangoon (*G. Q. Corbett*). Two examples in the British Museum are labelled "India" only.

Type in Mr. René Oberthür's collection.

This is an insect easily recognizable by the close longitudinal striation which almost entirely covers the surface of the head, a character not found elsewhere among the species of the group having sulcate ventral segments.

148. **Scarites rectifrons**, *Bates*.

Distichus rectifrons, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 272.

Head with strongly rounded front angles, projecting a little laterally, the surface adjoining them on each side very convex, buccal fissure not produced beyond base of mentum, clypeus without setæ, only slightly emarginate at middle, the emargination straight, edentate, with only a vague rounded tooth on each side of labrum, frontal impressions rather shallow, linear. with two fine carinæ bordering each, four or five similar carinæ on each side behind, vertex and middle of front usually with one or two vague irregular rugæ, neck hardly constricted, finely and not very closely punctate ; mandibles very nearly as long as head, smooth or with one or two small oblique carinæ on basal tooth, median carina almost straight, front tooth in left mandible fairly well developed, the carina on front tooth of right one very short ; eyes flat, largely enclosed behind by the genæ, which are as long as eyes, project quite as far laterally, and contract rather sharply to neck ; antennæ reaching hind angles of prothorax, dilated towards apex, at least joints 8 to 10 transverse ; mentum rather faintly rugose-striate, with very fine longitudinal carinæ on tooth and at sides. *Prothorax* a little wider than head and also a little wider than long, base slightly produced, apex deeply and widely emarginate, front angles produced and sharp, sides very gently rounded, bisetose, border subcrenulate, a sharp, well-developed tooth at each hind angle ; median line fine, front transverse impression fairly deep, basal foveæ wanting, sides of base with a little granulation, surface with some fine irregular puncturation on basal half. *Elytra* only moderately convex, slightly dilated behind, as wide as prothorax and very nearly twice as long as wide, sides of base curving very slightly backwards, the tooth at shoulder unusually large and sharp (less developed in type) ; striæ moderately deep, smooth or at most very finely and indistinctly punctate ; intervals moderately convex, 6 and 7 narrow and subcostate behind shoulder, 7 often subcostate throughout, 3 with four or five clearly marked pores ; surface shiny, with microsculpture visible only in the striæ, even near apex. *Sternum* : episterna and sides of sterna finely punctate, metepisterna fully twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs* : protibiæ with two denticulations above the upper tooth ; mesotibiæ with a single spur.

Length, 10·5–12·5 mm.

SIKKIM : Darjiling, Soom (*F H. Gravely*—Ind. Mus.) ; Kurseong (*E. A. d'Abreu*). BURMA : Bhamo and Katha (*L. Fea*). LAOS. TONKIN. YUNNAN.

Type in the Genoa Civic Museum.

The colour is normally black, but the specimens described by Bates are brown, a circumstance which is no doubt attributable to their immaturity.

149. **Scarites puncticollis,** *Chaud.*

Tæniolobus puncticollis, Chaudoir *, Bull. Mosc., 1855, i, p. 47.
Distichus puncticollis, Chaudoir, Mon. p. 55; Bates, Compt. rend. Soc. Ent. Belg. 1891, p. 325; Andrewes, Trans. Ent. Soc. Lond. 1921, pp. 146 and 168; id. in Mission Babault Ind. Carab. 1924, p. 9.

Head with front angles not emarginate or projecting laterally, clypeus emarginate at middle and with a short blunt tooth on each side of labrum, two minute teeth in the middle of the emargination, frontal impressions moderately deep, externally finely and densely striate, as are the sides behind, middle of front convex and shiny, neck very faintly constricted, closely punctate; mandibles shorter than head, faintly striate, median carina gently curved, basal tooth jagged in both, front tooth in left mandible obsolete, right one with the carina on front tooth not joining median carina; eyes rather flat, genæ inconspicuous; antennæ reaching hind angles of prothorax, dilated towards apex, joints 5 to 10 about as wide as long; mentum obliquely striate, with well-marked longitudinal carinæ on tooth and at sides. *Prothorax* a fifth wider than head and as much wider than long, base not produced, though a little sinuate on each side of median part, front angles evident though rounded, sides bisetose (though exceptionally the front seta is duplicated), almost straight, hind angles each with a small but sharp tooth; median line moderately deep, front transverse impression deep, crenulate, basal foveæ wanting, sides of base rather widely granulate-punctate, the punctures usually extending forward along sides to front angles. *Elytra* subdepressed, faintly dilated behind, as wide as prothorax and twice as long as wide, sides of base curving gently backward to shoulders, which are slightly though sharply dentate; striæ rather lightly impressed, finely punctate, very shallow near apex, where the punctures tend to disappear, 3 and 4 frequently joining at the penultimate pore and again separating; intervals nearly flat, 3 with three pores (the pore sometimes present in other species at about middle nearly always wanting); surface somewhat dull, covered by a conspicuous and uniform microsculpture, which extends to, though it is less evident on prothorax. *Sternum*: episterna and sides of sterna finely punctate, metepisterna quite twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with 1 or 2 denticulations above upper tooth; mesotibiæ with a single spur.

Length, 10·5–12 mm.

NEPAL: Janakpur; Chutri Gouri. BENGAL: Calcutta; Birbhum; Tinpahar; Berhampur; Narayanganj. BIHAR: Pusa: Chapra (*Mackenzie*). UNITED PROVINCES: Fyzabad (*R. W G. Hingston*). INDORE: Mhow. BOMBAY: Gogo (in Kathiawar). MADRAS: Surada; Kodaikanal; Pondicherry; Trichinopoly (*C. Leigh*); Walayar (*A. K. W Downing*). MYSORE: Madapur. CEYLON: Hambantota (*T. B. Fletcher*); Murunkan (*G. M. Henry*); Kalawewa.

Type in Mr. René Oberthür's collection.

The species is extremely common at Pusa, where large numbers of specimens have been taken by the collectors of the Agricultural Research Institute. In these the area within the front angles of the prothorax is always more or less punctate, but in other specimens—especially in those from Southern India—this puncturation has generally disappeared.

150. **Scarites uncinatus**, *Andr.*

Distichus uncinatus, Andrewes, Spol. Zeyl. xii, 1923, p. 225.

Head with the front angles subtruncate, the preocular angle not projecting laterally, clypeus emarginate at middle, with a short blunt tooth on each side of labrum, and two minute teeth in the emargination, frontal impressions fairly deep, linear, diverging behind, a few striæ at sides, extending to clypeus in front and neck behind, latter slightly constricted, the constriction lightly punctate; mandibles shorter than head, slightly striate, median carina gently curved, left mandible with two fairly sharp cusps on basal tooth, front tooth obsolete, right mandible with the basal tooth raised, the carina on front tooth not joining the median carina; eyes large and moderately prominent, genæ inconspicuous; antennæ reaching hind angles of prothorax, strongly dilated near apex, at least joints 8 to 10 transverse; mentum rugose-striate, with fine longitudinal carinæ on tooth and at sides. *Prothorax* about a fifth wider than head and as much wider than long, base hardly produced, but with a distinct sinuation on each side of the median part, apex widely but not deeply emarginate, front angles somewhat rounded, sides nearly straight, bisetose, a small sharp tooth at each hind angle; median line distinctly impressed, front transverse impression fairly deep, both subcrenulate, basal foveæ wanting, sides of base faintly granulate. *Elytra* rather flat, slightly dilated behind, as wide as prothorax and twice as long as wide, sides of base nearly straight, sloping gently back to shoulders, which have each a distinct, very sharp tooth; striæ fine and shallow, finely punctate (as in *S. punctum*); intervals nearly flat, 3 with three pores, at a fourth, three fourths, and close to apex (the penultimate one

being actually just outside stria 3, and therefore on interval 4) ; surface dull, with a very distinct microsculpture covering the whole of the elytra, that on prothorax composed of smaller meshes and chiefly visible on basal half. *Sternum* : episterna and sides of sterna finely rugose-punctate, metepisterna more than twice as long as wide. *Venter* with segments 4 to 6 transversely sulcate. *Legs* : protibiæ with one or two denticulations above upper tooth ; mesotibiæ with a single spur.

Length, 12–13 mm.

CEYLON : Hambegamuwa.

Type in the British Museum ; a cotype in the Colombo Museum, and another one in my collection.

The microsculpture in this species is unusually distinct, and in that respect it closely resembles *punctum* and *puncticollis*.

151. **Scarites modestus**, *Chaud.*

Distichus modestus, Chaudoir *, Mon. p. 57.

" This species is near *picicornis*, and still nearer to *lucidulus* [=*parvus*, Wied.] ; it is wider but not longer than the former, with the metepisterna visibly shorter, and without wings under the elytra, which is the only exception in the genus [*i.e.* at that time and in the subgenus *Distichus* of the Monograph]. The *head* resembles that of *lucidulus* and is similarly striate, but the bottom of the frontal impressions is less deeply furrowed ; the vertex is similarly punctate ; the eyes are less convex and less enclosed by the genæ behind ; the labrum is apparently not trilobed ; the teeth on the mandibles are as large, but the emargination separating those on the right mandible is deeper ; the outer joints of the antennæ up to 10 are wider than long. The *prothorax* has the same form as that of *lucidulus*, but the front angles are more rounded, and, as in *picicornis*, there are only two small setiferous pores in the lateral channel. The *elytra* are relatively much shorter than in *picicornis*, the sides are not parallel, but somewhat rounded towards the middle ; the striæ are quite smooth, and there are three or four pores on the third ; the upper surface, without being semicylindrical, is nevertheless moderately convex. The colour is brownish black, the surface not very shiny, the legs of a redder brown than the antennæ and palpi. The habitat is the East Indies, without any more precise designation."

Length, 9·5 mm. ; width 2·6 mm.

EAST INDIES.

Type in Mr. René Oberthür's collection.

The type is unique, and, although I saw it some years ago, I have not got it before me now, and give therefore a free translation of the author's description. It is not at all certain

where this specimen was found, but Chaudoir received much material collected in Northern India by Capt. Boys and Dr. Bacon, so that I have thought it desirable to include it here.

According to my notes, the principal points in which *modestus* differs from *beesoni* are the following: its much smaller size, the presence of fewer striæ on the head, only a slight tooth on the shoulders of the elytra, and three pores instead of four on interval 3. Chaudoir mentions "three or four pores" on interval 3, but there is only one specimen, so presumably there are three on one elytron and four on the other.

The presence of more than two setæ on each side of the metasternum behind the mesocoxæ, as mentioned in the "Key", is in this species conjectural.

152. **Scarites beesoni**, sp. nov.

Head wide, front angles truncate, the preocular angle projecting very slightly laterally, clypeus emarginate, with a short blunt tooth on each side of labrum, frontal impressions rather shallow, the surface closely longitudinally striate, the vertex and a small area adjoining each front angle smooth, neck unconstricted, punctate at sides, one or two minute punctures across middle; mandibles nearly as long as head, moderately striate, median carina gently curved, basal teeth in both somewhat jagged, left mandible with a distinct front tooth, right mandible with the carina of the front tooth reaching base and running parallel with the median carina, eyes rather flat, genæ as long as eyes and projecting as far laterally, contracting quickly to neck; antennæ not reaching hind angles of prothorax, dilated towards apex, joints 5 to 10 transverse; mentum granulate, with longitudinal carinæ on tooth and at sides. *Prothorax* just wider than head and about a fifth wider than long, base not produced, its sides gently curved, apex only slightly emarginate, front angles rather sharp, though not produced, sides bisetose, almost parallel, a minute tooth at each hind angle; median line fine, front transverse impression moderately deep, crenulate, basal foveæ wanting, sides of base very finely granulate, the granulation extending narrowly across middle. *Elytra* convex, elongate-ovate, widest a little behind middle, barely as wide as prothorax, twice as long as wide, sides of base nearly straight, sloping back to shoulders, which are sharply dentate; striæ impunctate, moderately deep, deeper at sides; intervals rather flat on disk, convex at sides, 6 and 7 narrower and subcostate behind shoulder, 3 with four pores; surface shiny, with a microsculpture which is distinct at apex but visible in front only in the striæ, and also rather faintly on base of prothorax.

Sternum: episterna and sides of sterna finely granulate-punctate, metepisterna about half as long again as wide, metasternum with four visible setæ on each side behind the mesocoxæ. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with two denticulations above upper tooth; mesotibiæ with a single spur. Body apterous.

Length, 14 mm.

BENGAL: Rajabhatkhawa, Buxa division, 1 ex. "ex. sal" (*C. F. C. Beeson*).

Type in the British Museum.

153. **Scarites birmanicus**, *Bates*.

Tæniolobus birmanicus, Bates*, Ann. Mus. Civ. Gen. xxxii, 1892, p. 270.

Head with front angles truncate, the preocular angle projecting a little laterally, clypeus slightly emarginate and with a short blunt tooth on each side of labrum, frontal impressions shallow, surface covered with rather coarse longitudinal striation, leaving vertex and a small area near each front angle smooth, neck unconstricted, a few punctures on each side behind (which in type stretch across the neck); mandibles shorter than head, moderately striate, median carina gently curved, basal tooth in both somewhat jagged, left mandible with a very small front tooth, right one with the carina on front tooth not joining the median one; eyes moderately prominent, but enclosed behind by the genæ, which are conspicuous, longer than eyes, project a little further, and contract sharply to neck; antennæ barely reaching hind angles of prothorax, dilated towards apex, joints 5 to 10 evidently transverse; mentum granulate, with longitudinal carinæ on tooth and at sides. *Prothorax* a little wider than head and about a fourth wider than long, widest a little in front of middle, in outline rather more than a semicircle, with the middle of base very faintly truncate, apex moderately emarginate, front angles rather sharp, though not produced, sides bisetose, hind angles minutely dentate; median line very faint, front transverse impression moderately deep, subcrenulate, basal foveæ wanting, basal area rather narrowly and very finely granulate. *Elytra* convex, elongate-ovate, widest at about middle, rather pointed at apex, a little wider than prothorax, less than twice as long as wide, base somewhat deeply emarginate, its sides curving back to shoulders, which are sharply dentate; striæ deep, impunctate, all except 1 disappearing a little before apex; intervals convex, 3 with five pores; surface moderately shiny, with a microsculpture which is distinct on apical half, indistinct on basal half and on

prothorax. *Sternum*: episterna and sides of sterna finely punctate-granulate, metepisterna only a half longer than wide, metasternum with at least three setæ on each side behind the mesocoxæ. *Venter* with segments 4 to 6 transversely sulcate. *Legs*: protibiæ with three denticulations above upper tooth; mesotibiæ with a single spur. Body apterous.

Length, 15–16 mm.

ASSAM: Manipur (*Doherty*). BURMA: Teinzo (*L. Fea*—type).

Type in the Genoa Civic Museum.

In addition to the type, I have seen only two examples from Manipur, now in the British Museum. In these the prothorax is rather more transverse, and has not quite the same even semicircular outline, but in other respects they agree well with the typical specimen. In this species there are at least three setiferous pores on each side of the metasternum behind the mesocoxæ.

Subgroup II. *OXYLOBIDES.*

The solitary genus for which this new subgroup is formed was placed by Chaudoir among his "Scaritides," but it differs in so many ways from the other genera which he included that it has seemed to me desirable to remove it from among them. The short buccal fissure, the unusual form which the left mandible sometimes assumes in the ♂, the bisetose second joint of the labial palpi, the deep and rather narrow frontal foveæ, and the very convex body all distinguish the genus from *Scarites* and its allies. The species are found only in India and Ceylon, and in Southern India they are fairly numerous.

Genus **OXYLOBUS.**

Oxylobus, Chaudoir, Bull. Mosc. 1855, i, p. 5; id., Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 129; Andrewes in Mission Babault Ind. Carab. 1924, p. 8.

TYPE, *Scarites porcatus*, F (India.)

Form elongate, convex, body apterous, glabrous, usually with a very shiny surface. *Head* little narrower than prothorax, wide and rather flat, the front angles obliquely truncate; two longitudinal frontal impressions, more or less deep and narrow, often linear; neck slightly constricted, the constriction often obsolete at middle, but fairly deep at sides, where there are usually some rugæ and punctures; eyes not usually prominent, largely enclosed in the genæ, which form a flattened plate beneath them, with one supraorbital seta; labrum trilobate, the median lobe usually longer than the

lateral ones, bisetose or, more generally, quadrisetose, in which case the position of the middle pair of setæ is variable ; clypeus strongly transverse, its suture lightly impressed and often obsolete, truncate or slightly emarginate in front, frequently with a small tooth on each side of labrum ; mandibles stout, with three or four strong teeth, upper surface generally striate, left mandible (♂) sometimes greatly enlarged and contorted, so that the left side of the head may become quite asymmetrical ; ligula normally completely hidden, pubescent, apex thick and concave, joining tooth of mentum, a lateral tooth on each side, paraglossæ narrow, adnate ; mentum small and somewhat narrow, moderately emarginate, the central tooth sharp and about as long as lateral lobes ; buccal fissure not extending backwards beyond base of mentum, submentum produced at each side into an elongate process, forming the paragena, lying between the antennal groove and the mentum ; maxillæ curved, dilated and obtuse at apex, densely ciliate within and to some extent also near apex along outer margin, outer lobe jointed, as long as, or very little longer than inner lobe ; palpi short and stout, maxillaries with joint 2 strongly inflated, labials with joints 2 and 3 about equal, 2 bisetose ; antennæ short, stout, moniliform, pubescent from joint 5, joint 1 subclavate, lying, when recurved, in a short, wide groove between genæ and paragenæ, nearly as long as 2+3+4, but hardly scapiform. *Prothorax* convex, more or less quadrate, base strongly arcuate, sometimes semicircular, with the hind angles entirely obliterated ; sides and base bordered, apex bordered close to angles only, from 1 to 6 front lateral setæ, the outline sometimes broken by the pore or pores from which they spring, a single pore and seta marking the site of hind angle ; basal foveæ generally obsolete, median line and front transverse impression seldom deep, often faint, a deep pore sometimes formed within the front angle at the point where the lateral channel, after rounding the angle, joins the transverse impression. *Elytra* hardly wider than prothorax, connate, oval, and very convex, the shoulders largely rounded away, epipleura nearly always punctate, basal area sometimes dilated and always more or less tuberculate, no scutellary striole, striæ variable in number, form, and mode of puncturation, but frequently foveolate near apex, marginal channel often containing two fine striæ, the outer one formed by a row of small subtuberculate, umbilicate, setigerous pores, the inner one formed chiefly by small punctures, confined sometimes to the apical half, interval 3 with or without one or two pores. *Sternum* : prosternum smooth, or with one or two punctures at sides ; metasternal process sometimes bordered, metepisterna very small. *Venter* : the segments sometimes more or less smooth, but nearly always

with a transverse row of coarse punctures, last segment coarsely and irregularly punctate, a single seta on each side of margin in both sexes. *Legs* stout and adapted for digging, profemora dilated, protibiæ wide, 3-digitate (including apical digitation) on outer margin, mesotibiæ with a single external tooth near apex, metacoxæ not contiguous, claws smooth.

Range India and Ceylon. A single species (one example only), alleged to come from Tonkin and described by Tchitcherin, is almost certainly wrongly labelled.

Nothing is known regarding the life-history, and, as to habitat, my own specimens were always taken under stones or dung. The colour is always black, the surface generally very shiny, though occasionally dull. The oval, convex elytra render the genus easily recognizable, but it is also remarkable for its very unusual obtuse maxillæ, which can be observed without difficulty. The foveæ, so frequently present in the striæ, nearly always get filled up with mud, so that the elytra of specimens, when taken, are generally, at all events near apex, of the colour of clay.

Key to the Species.

1 (16) Elytra 9-striate.
2 (15) Elytra with stria 5 not duplicated anywhere along its course.
3 (12) Elytra with nine intervals between suture and marginal channel; shoulders not dentate.
4 (11) Elytral striæ on basal half either finely punctate or impunctate; intervals on disk approximately equal in width.
5 (8) Elytral striæ on basal half finely but distinctly punctate.
6 (7) Elytra with interval 6 on basal half moderately convex and hardly narrower than 1 to 3; lateral channel of prothorax with three to six setæ on each side in front . . . . . *mahratta*, sp. nov., [p. 297.
7 (6) Elytra with interval 6 on basal half narrower and more convex than 1 to 3; lateral channel of prothorax with two setæ on each side in front *meridionalis*, Bates, [p. 298.
8 (5) Elytral striæ on basal half impunctate or at most vaguely crenulate.
9 (10) Elytral intervals carinate at apex; sides of prothorax parallel *dekkanus*, sp. nov., [p. 299.
10 (9) Elytral intervals not carinate at apex; sides of prothorax strongly contracted in front . . . . . *follis*, sp. nov., p. 299.
11 (4) Elytral striæ with coarse rounded punctures; intervals on disk conspicuously unequal [p. 300. *inæqualis*, sp. nov.,

12 (3) Elytra with eight intervals between suture and marginal channel.

13 (14) Elytra with intervals on disk about equal, shoulders dentate. Length 19·5 mm. . .. . — *dentatus*, sp. nov., [p. 301.

14 (13) Elytra with intervals on disk unequal, shoulders not dentate. Length 17·5 mm. .... — *alternans*, sp. nov., [p. 302.

15 (2) Elytra with stria 5 duplicated, at least on apical half. .. .. — *dispar*, sp. nov., p. 303.

16 (1) Elytra with less than nine striæ (but see *dispar*).

17 (20) Elytra with eight intervals between suture and marginal channel.

18 (19) Elytral striæ wide and very clearly punctate — [Chaud., p. 304. *punctatosulcatus*,

19 (18) Elytral striæ narrow, with fine punctures, often evanescent on disk. — *punctatosulcatus*, Chaud., var. *fugiens*, var. nov., p. 305.

20 (17) Elytra with less than eight intervals between suture and marginal channel.

21 (58) Elytra with seven intervals between suture and marginal channel (two striæ usually lying close together in marginal channel, the inner one sometimes obsolete).

22 (39) Prothorax with a foveole within front angles.

23 (34) Elytra with intervals on disk more or less costate or carinate, even on basal half.

24 (31) Elytra with intervals carinate throughout, 2 and 4 (except when the carinæ on these are obsolete) much finer than the others.

25 (30) Head practically impunctate; foveole within front angles large and rounded.

26 (29) Elytra with all the carinæ present.

27 (28) Venter with transverse rows of coarse punctures across the segments. Average length 19 mm. .. — *porcatus*, F., p. 305.

28 (27) Venter almost impunctate. Average length 15 mm. .. . ... — [Tchitch., p. 306. *porcatus*, F., var. *minor*,

29 (26) Elytra with the carina on interval 4 quite, and that on interval 2 nearly, obliterated. — *porcatus*, F., var. *obliteratus*, var. nov., p. 307.

30 (25) Head with numerous punctures behind; foveole within the front angles oblong, small but deep. . — *pygmæus*, sp. nov., [p. 307.

31 (24) Elytra with intervals not carinate, at least on disk.

32 (33) Elytra with intervals costate on basal half; interval 3 with a pore behind; median tooth of labrum without setigerous pore or pores — *lirifer*, sp. nov., p. 307.

33 (32) Elytra with intervals 1 and 2 not costate on basal half; interval 3 without pore behind; median tooth of labrum with a pore and seta — *alveolatus*, Chaud., [p. 308.

34 (23) Elytra with intervals on disk flat, or at most moderately convex.

35 (38) Head not covered by longitudinal rugæ; elytra with intervals only moderately convex at apex.

36 (37) Elytra with striæ on disk lightly impressed; interval 3 bipunctate at apex. Average length 22 mm. . . — *bipunctatus*, sp. nov., [p. 309.

37 (36) Elytra with striæ on disk deep; interval 3 impunctate. Average length 12 mm. . .. . — *foveiger*, Chaud., [p. 310.

38 (35) Head covered by longitudinal rugæ; elytra with intervals costate at apex. — *rugiceps*, sp. nov., [p. 310.

39 (22) Prothorax without a foveole within front angles.

40 (57) Head not densely and coarsely punctate.

41 (50) Prothorax widest at or before middle; inner pair of setæ on labrum placed together in a single or double pore on middle of central tooth.

42 (47) Prothorax with front transverse impression within the angles as wide and deep as frontal impressions; elytra with interval 3 unipunctate or impunctate.

43 (46) Head with short, straight frontal impressions, not reaching neck constriction; ♂ with left sides of clypeus and mentum asymmetrical; interval 3 with or without pore.

44 (45) Venter smooth along median line; ♂ with left mandible bent strongly upwards. Average length 15 mm. — [p. 311. *asperulus*, Chaud.,

45 (44) Venter coarsely punctate across each segment; ♂ with left mandible not bent strongly upwards. Average length 20 mm. — *asperulus*, Chaud., var. *amyntas*, Andr., p. 313.

46 (43) Head with sinuate frontal impressions, reaching neck constriction; ♂ with clypeus and mentum symmetrical; interval 3 with one pore .. — *quadricollis*, Chaud., [p. 314.

47 (42) Prothorax with front transverse impression within the angles not as wide or deep as frontal impressions; elytra with interval 3 bipunctate.

48 (49) Prothorax with front transverse impression much deeper within the angle. Length 14 mm .. — *montanus*, sp. nov., [p. 315.

49 (48) Prothorax with front transverse impression equally deep throughout. Length 12 mm.. — *nanus*, sp. nov., p. 315.

50 (41)	Prothorax widest at basal third; inner pair of setæ on labrum placed far apart.	
51 (54)	Prothorax only slightly contracted in front, the outline broken by the front lateral setigerous pore or pores. Average length 17 mm.	
(53)	Elytra with striæ on disk finely punctate.	*lateralis*, Dej., p. 316.
53 (52)	Elytra with striæ on disk impunctate.	*lateralis*, Dej., var *designans*, Walk., p. 318.
54 (51)	Prothorax rather strongly contracted in front, the outline at sides unbroken. Average length 23 mm.	
55 (56)	Elytra with striæ impunctate or very finely punctate at sides; intervals before apex not costate.	*lateralis*, Dej., var. *ingens*, var. nov., p. 318.
56 (55)	Elytra with striæ moderately punctate at sides; intervals before apex costate.	*ovalipennis*, Andr., [p. 319.
57 (40)	Head densely and coarsely punctate	*rugatus*, Bänn., p. 319.
58 (21)	Elytra with six intervals between suture and marginal channel; left mandible (♂) with two projecting teeth on outer margin at base.	*armatus*, sp.nov., p. 320.

154. **Oxylobus mahratta**, sp. nov. [Plate VII, fig. 1.]

Head moderately convex, smooth, with a few slight striæ near eye and one or two fine punctures behind them, neck constriction just visible at sides; eyes (with genæ) somewhat oblique, genæ projecting behind; labrum strongly trilobed, the four setæ equidistant, clypeus faintly striate, a little emarginate but hardly dentate at sides, clypeal suture extremely fine and only just visible; frontal impressions narrow, parallel, not very deep, just reaching front eye-level; mandibles finely striate, paragenæ very obtusely toothed on inner margin. *Prothorax* nearly a third wider than head, a little wider than long, moderately contracted in front, widest at middle, sides gently rounded, with a series of three to six setiferous pores on front half, placed in the marginal channel; median line fine but distinct, basal foveæ barely visible, marginal channel deep at front angles, which it rounds sharply, but without forming a distinct pore, transverse impression fine, but visible across disk. *Elytra* a little wider than prothorax, and a little more than half as long again as wide, epipleura with only one or two scattered punctures; 9-striate, striæ deep at sides, moderately deep on disk, rather finely punctate, the punctures becoming deeper and foveolate near apex, 1 to 4 free at base, 5 and 6 approximate and sometimes joining; intervals convex at sides, moderately so on disk, costate but

hardly carinate at apex, 1 and 3 wider than the rest behind 6 a little narrower and much narrower close to base, 8 carinate on inner margin, except close to apex, which it reaches, 9 a very fine carina throughout, 3 with a large pore (sometimes indistinguishable) not far from apex. *Sternum*: prosternal process smooth and even, metasternal process faintly bordered, with or without one or two punctures on each side. *Venter*: the segments with a transverse row of coarse punctures, few in number, and irregularly placed on last one.

Length, 17·5–22 mm.; width, 5–6·7 mm.

BOMBAY: Sampgaon and Sanikop in the Belgaum district (*R. P. Barrow* and *H. E. Andrewes*).

Type in my collection.

155. **Oxylobus meridionalis**, *Bates*. [Plate VII, fig. 2.]

Oxylobus punctatosulcatus, Chaud., var. *meridionalis*, Bates*, Compt. rend. Soc. Ent. Belg. 1891, p. 325 (note).

Head rather flat, surface a little uneven, one or two punctures in front at sides and near the eyes behind, neck constriction deep at sides, obsolete on disk; eyes (with genæ) rounded and moderately prominent; labrum with median lobe rounded, the setæ equidistant, clypeus truncate, its surface raised in the middle, striate at sides, the striation extending on to front; clypeal suture distinct, frontal impressions short and narrow, fairly deep, diverging a little behind, barely reaching mid-eye level. *Prothorax* less than a half wider than head, very little wider than long, somewhat contracted in front, sides nearly straight at middle, rounded in front, as are the angles, border very narrow, with two setiferous pores on each side in front, placed near the margin, but hardly indenting the border; median line fine but distinct, basal foveæ very slight, lateral channel deep in front, rounding the angle without forming any pore or even making an angle at junction with the faint transverse impression. *Elytra* a little wider than prothorax and about two-thirds longer than wide, epipleura punctate along outer margin; 9-striate, striæ deep, though a little less so on disk, and finely punctate, the punctures larger but not foveolate even at apex, 1 to 4 free at base, 5 joining 6; intervals convex, costate at sides and behind, outer ones subcarinate at apex, 6 a little, and 8 much, narrower than the rest, 8 carinate throughout, joining 7 before reaching apex, 9 a fine crenulate raised line, 3 with or without pore behind. *Sternum*: metasternal process without sulcus at sides. *Venter* coarsely punctate, the punctures more or less in rows across the segments, last segment with more punctures, more irregularly disposed.

Length, 21–22 mm. ; width, 6·4 mm.

SOUTH INDIA.

Type in Mr. René Oberthür's collection. There are also two examples in the British Museum.

No exact locality is known.

156. **Oxylobus dekkanus**, sp. nov. [Plate VII, fig. 3.]

Head slightly convex, surface smooth, but a little uneven, one or two vague striæ and a few punctures at sides behind, neck constriction distinct at sides only ; eyes moderately prominent, the genæ forming almost an angle behind ; labrum strongly trilobed, median lobe rounded and convex, setæ equidistant, clypeus truncate, striate at sides ; clypeal suture just visible between frontal impressions, which are narrow, not very deep, widen a little behind, and do not extend beyond mid-eye level. *Prothorax* a fourth wider than head and slightly wider than long, sides nearly parallel, rounded, and contracted close to front angles, three lateral setæ on each side in front, placed in the marginal channel ; median line fine, but distinct, basal foveæ small and faint, rounded or oblique, lateral channel rounding front angle sharply and deep at that point, transverse impression rather fine. *Elytra* barely wider than prothorax, two-thirds longer than wide, epipleura rather closely punctate, at least on outer side and near base ; 9-striate, the striæ deep at sides, a little less so on disk, smooth or very feebly crenulate on basal three-fourths, foveolate on apical fourth, 1 to 4 free at base, 5 joining 6 ; intervals moderately convex on disk, strongly so at sides, carinate close to apex, becoming gradually a little narrower towards sides, 1 to 3 wider behind, 8 narrow and costate, reaching shoulder, but joining 7 or disappearing at some distance from apex, 9 formed by a very fine raised line, 3 with a large pore (sometimes wanting) at a fourth from apex. *Sternum* : prosternal process with some vague striation, metasternal process very indistinctly bordered, impunctate. *Venter* smooth, with not more than two or three punctures on each side of median line, apical segment with two or three small patches of punctures irregularly disposed.

Length, 22–25 mm. ; width, 6·3–7·5 mm.

MYSORE : Bangalore (British Mus., Madras Mus., and Oxford Univ. Mus.).

Type in my collection.

157. **Oxylobus follis**, sp. nov. [Plate VII, fig. 4.]

Head nearly smooth, some short striæ and a few punctures near eye behind, neck constriction evident at sides ; eyes small, fairly prominent, and (with genæ) rounded : labrum

with the setæ equidistant, clypeus slightly emarginate at middle, some vague striation before frontal impressions; clypeal suture distinct in middle, obsolete at sides, frontal impressions moderately deep, parallel, linear, nearly reaching hind-eye level. *Prothorax* quite a half wider than head, a little wider than long, strongly contracted in front, where the angles are evident, though rounded, sides almost straight, but rounded behind front angles, narrowly bordered, with three (sometimes two) setæ in the lateral channel in front; median line fine, basal foveæ very small, though more distinct than usual, lateral channel rounding the front angles rather widely, without trace of a pore, transverse impression shallow but distinct. *Elytra* a fourth wider than prothorax, and about half as long again as wide, epipleura punctate along outer margin; 9-striate, the striæ moderately deep and finely punctate or crenulate, the punctures large at apex, though hardly foveolate, 1 to 4 free at base, 5 joining 6, 7 joining 8, all (except 7) reaching or nearly reaching apex; intervals varying in the amount of convexity, narrower and more convex at apex, 3 generally a little wider, 6 and 8 a little narrower than the rest, 8 subcostate but not carinate, 9 a fine raised line throughout, 3 with a pore near apex. *Sternum*: pro- and metasternal processes quite smooth. *Venter* punctate at sides of base, elsewhere very irregularly.

Length, 19–23 mm.; width, 6–7·5 mm.

MADRAS: Kodaikanal (*Castets*); Horseley Konda (*E. Barnes*) and Sirumalais (Madras Mus.). TRAVANCORE: Pirmaid (*Mrs. R. Imray*—British Mus. and Oxford Univ. Mus.); Wallardi (*Favre*—coll. Bänninger).

Type in my collection.

The specimens from the above-mentioned localities all agree in the number of the striæ and the strong contraction of the prothorax in front. The puncturation and depth of the striæ, as also the width and convexity of the intervals, are subject to much variation. The Pirmaid examples are widest and flattest, with shallower striæ, the intervals of equal width. The Sirumalais examples are the smallest and most convex, the striæ deep and very finely crenulated. The characters of the Kodaikanal specimen (type) lie between those of the other two.

158. **Oxylobus inæqualis**, sp. nov. [Plate VII, fig. 5.]

Head moderately convex, surface striate-punctate on each side behind, eyes (with genæ) rounded; labrum trilobed, with the four setæ equidistant, clypeus rather faintly longitudinally striate, sides of median part only slightly advanced; clypeal suture fine but distinct, frontal impressions narrow, fairly deep, diverging a little behind, and reaching mid-eye level.

Prothorax rather wider than head and a little wider than long slightly contracted in front, sides gently rounded, two or three setiferous pores in front in the lateral channel ; median line fine, deeper close to base, basal foveæ distinct but shallow, lateral channel rounding front angle sharply, and deep at that point, but without forming any distinct pore, transverse impression fine but evident. *Elytra* a little wider than prothorax, two-thirds longer than wide, epipleura finely and not closely punctate ; 9-striate, the striæ deep and deeply punctate, but hardly foveolate, except close to apex, 1 to 4 free at base, 5 joining 6, 9 finely tuberculate-punctate ; intervals costate, carinate at apex, odd much wider than even ones, 8 carinate at base and reaching apex, 9 a very fine carina throughout, 3 with a large pore not far from apex. *Sternum* : prosternal process depressed, metasternal process slightly bordered by a few punctures. *Venter* coarsely punctate, last segment irregularly, the other segments each with a transverse row of punctures.

Length, 21 mm. ; width, 6·5 mm.

BOMBAY : Kanara (*T. R. D. Bell*).

Type in my collection.

159. **Oxylobus dentatus**, sp. nov.

Head smooth, with only a trace of striation and no punctures near eyes, neck constriction very slight, at sides only ; eyes moderately prominent, rounded, genæ hardly visible from above ; labrum with median lobe pointed, the two inner pores small, placed close together on the lobe, clypeus emarginate, smooth ; clypeal suture barely visible, frontal impressions short, linear, parallel, rather wide apart. *Prothorax* half as wide again as head, a fourth wider than long, very slightly contracted in front, front angles rounded, sides nearly straight but rounded behind, a single seta in the lateral channel in front ; median line fine but distinct, basal foveæ visible, lateral channel rounding front angle sharply, and moderately deep, though forming no pore, transverse impression quite distinct. *Elytra* as wide as prothorax, rather less than twice as long as wide, epipleura very finely punctate, chiefly along outer margin, border dentate at shoulder, the tooth standing out very clearly beneath the base of interval 7, base bordered by a row of small tubercles ; 9-striate, striæ moderately deep and punctate on disk, much deeper and wider both at sides and apex, where the punctures become transverse foveæ, 1 turning outwards at base and almost joining 2, 3 and 4 free, 5 joining 6, 8 and 9 lying together in marginal channel ; intervals rather flat on disk, strongly convex at sides, outer ones subcarinate on inner margins, 1 to 3 strongly costate near apex, 4 to 6 carinate, and all much narrowed, 7 carinate throughout, projecting laterally

and overhanging the sides at base, 8 formed by a fine carina, not reaching base, and joining 7 behind, 3 without pore. *Sternum*: metasternal process with a short punctate sulcus on each side, not reaching extremity.

Length, 19·5 mm.; width, 6 mm.

MADRAS.

Type in the Oxford University Museum (Hope Department).

The type is unique and also imperfect, having lost the abdomen, but, as the species presents some unusual characters, including a tooth on the shoulders of the elytra, which is unique in the genus, it seems best to describe it.

160. **Oxylobus alternans**, sp. nov. [Plate VII, fig. 6.]

Head wide, flat, and nearly smooth, one or two coarse rugæ and punctures behind between fovea and eye, neck constriction shallow but visible throughout, eyes rather flat, the genæ evident behind; labrum with its median lobe considerably in advance of the lateral lobes, and bearing a single pore, clypeus with a well-developed tooth on each side of labrum; clypeal suture distinct throughout, frontal impressions deep, diverging a little behind, just reaching neck constriction. *Prothorax* a little wider than head and about a fifth wider than long, widest at middle, apex distinctly emarginate, sides very gently rounded, with two setæ on each side in front; median line moderately deep, basal foveæ inconspicuous, lateral channel fairly deep, rounding front angle sharply, but not forming any fovea within it, the transverse impression rather shallow. *Elytra* barely wider than prothorax, nearly twice as long as wide, with the basal margin widened at shoulder and strongly tuberculate, a row of tubercles extending to middle, epipleura moderately punctate; 9-striate, the striæ deep, with rounded punctures, which become foveolate near apex, 1 to 4 free at base, 5 joining 6, 8 and 9 lying together in marginal channel, the punctures in 8 not reaching base; intervals moderately flat on middle of disk, becoming costate at sides and apex, 6 and 7 carinate along inner margin, 8 very narrow and carinate throughout, 6 and 8 not reaching base, 5, 6, and 8 not reaching apex, 4 terminating at apical fourth, the odd wider than the even intervals, 3 with two pores, at four-fifths and close to apex. *Sternum*: prosternum with a few pores at sides, its process slightly sulcate. *Venter* with a row of coarse punctures across the segments.

Length, 17·5 mm.; width, 4·6 mm.

"SOUTH INDIA" (*Major Beddom*—type). TRAVANCORE: Wallardi (*Favre*—coll. Bänninger).

Type in the Indian Museum. In the Wallardi example interval 6 is a fine carina, and does not nearly reach the shoulder.

161. Oxylobus dispar, sp. nov.

Head wide and rather flat, smooth, but with one or two rugæ and punctures near eye behind, neck-constriction distinct but shallow, eyes fairly large and rather flat; labrum with median lobe wide, rounded, in advance of lateral lobes, the two inner pores placed close together, clypeus with a slight tooth on each side of labrum; clypeal suture very faint, but visible in middle, frontal impressions narrow, diverging strongly in front on to clypeus, only slightly behind, not reaching neck constriction; mandibles externally angulate at base, not striate, left one (♂) bent somewhat upwards and inwards, the lower margin of scrobe produced outwards to form a rounded ridge, visible from above. *Prothorax* very little wider than head, a third wider than long, widest close to apex, front angles rounded, sides nearly parallel, with two (sometimes three) setæ in front, on the border, but not indenting the outline; median line short but moderately deep, basal foveæ present but inconspicuous, basal channel foveolate, lateral channel deep, rounding front angle and forming a deep impression within it (but not a rounded pore), transverse impression nearly obliterated. *Elytra* barely wider than prothorax, practically twice as long as wide, with the basal margin widened out at shoulder, with a slight sinuation behind, base finely and rather closely tuberculate, epipleura strongly punctate; 8-striate (but see below), the striæ with large rounded punctures which become transverse foveæ near apex, 1, 2, and 5 free at base, 3 joining 4, 7 and 8 lying together in marginal channel, the punctures in 7 fairly large and rounded, 5 irregularly duplicated, either throughout or at least on basal half, with traces of a fine carinate intervening interval; intervals convex, costate at sides, 7 carinate, and all more or less carinate close to apex, 3 a little wider than the rest, with a pore at apical fourth. *Sternum*: prosternum with some coarse punctures at sides, its process and metasternal process smooth. *Venter* with a row of coarse punctures across each segment.

Length, 17–17·5 mm.; width, 5–5·25 mm.

BOMBAY: Kanara (*T. R. D. Bell*); Belgaum, Talewadi (*S. H. Prater*—Bombay Nat. Hist. Soc.); Castle Rock (*S. W Kemp*—Ind. Mus.). TRAVANCORE (*G. S. Imray*—British Mus.).

Type in my collection.

One example from Kanara shows hardly any trace of duplication in stria 5.

162. **Oxylobus punctatosulcatus**, *Chaud.*

Oxylobus punctatosulcatus, Chaudoir*, Bull. Mosc. 1855, i, p. 6; id., Mon. des Scaritides (i.), Ann. Soc. Ent. Belg. 1879, p. 131; Bates, Compt. rend. Soc. Ent. Belg. 1891, p. 325.

Head with the surface a little uneven and microscopically punctulate, a few striæ at sides behind, but no normal punctures, neck constriction slight and visible only at sides, eyes small and (with genæ) rounded; labrum trilobate, the middle pair of setæ generally nearer to each other than to the outer ones, clypeus slightly emarginate and vaguely striate; clypeal suture fine, but generally visible throughout, frontal impressions narrow, reaching mid-eye level, sometimes bifurcating behind, a slight oblique stria on each side within them. *Prothorax* nearly half as wide again as head, but not very much wider than long, gently contracted in front, the front angles evident though rounded, sides faintly curved, with two (sometimes three) setæ in front, placed in the lateral channel; median line fine but clear, basal foveæ just visible, lateral channel rounding front angle rather sharply, fairly deep, but not forming any pore, transverse impression fine but distinct. *Elytra* barely wider than prothorax, very nearly twice as long as wide, epipleura punctate along outer margin in front; 8-striate, striæ deep, especially close to base, and rather strongly punctate, foveolate near apex, all free at base; intervals moderately convex, outer ones subcarinate on inner margin, much narrowed, but hardly carinate near apex, 4 a little narrower than the adjoining intervals, especially at extremities, 3 a little widest throughout, 7 costate, reaching apex, about half as wide as 6, 8 formed by a fine carina, 3 with a large pore (Chaudoir mentions two pores in type) at about a fifth from apex. *Sternum*: all sterna and episterna practically smooth. *Venter* with a row of large punctures across each segment, last one coarsely and irregularly punctate.

Length, 20–24 mm.; width, 5·75–6·3 mm.

NEPAL (type). CHOTA NAGPUR: Tetara (*R. P Cardon*); Ranchi (*W H. Irvine*—Ind. Mus.); Chakardharpur (*F H. Gravely*—Ind. Mus.). CENTRAL PROVINCES: Motinala (*N C Chatterjee*). MADRAS.

Chaudoir's specimens were said to come from Nepal, and examples in my own collection are labelled "Madras." I think both these indications doubtful. A specimen in the Hope collection at Oxford is labelled "Darpouillie," a locality which I identify with Dapoli in the Ratnagiri district, Bombay.

162 *a*. **Cxylobus punctatosulcatus**, *Chaud.*, var. **fugiens**, var. nov.

In this variety, which on average seems a little larger than the type-form, the elytral striæ are narrower and the punctures very small, so that the inner striæ are sometimes only vaguely crenulate. The intervals are consequently much flatter, and the outer ones present a much slighter carina. Two other characters are usually present, viz. a few punctures on the back of the head at sides, and smoother sides to the venter, but neither character is constant. The type-form seems to occur in North-East and the variety in South-East India. The South Indian form is very variable in the degree of puncturation of the striæ.

Length, 21–25 mm.

CENTRAL PROVINCES : Berar. MADRAS : Pondicherry (Brit. Mus.) ; Horseley Konda (*E. Barnes*—Madras Mus.). MYSORE : Bangalore.

Type in my collection.

163. **Oxylobus porcatus**, *F.* [Plate VIII, fig. 1.]

Scarites porcatus, Fabricius*, Suppl. Ent. Syst. 1798, p. 43; Hope, Col. Mon. ii, 1838, p. 95; Motchulsky, Etudes Ent. 1855, p. 40.

Oxylobus costatus, Chaudoir*, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 134; Bates, Compt. rend. Soc. Ent. Belg. 1891, p. 325; Andrewes, Rec. Ind. Mus. xxii, 1921, p. 339.

Oxylobus porcatus, Heyne-Taschenberg, Die Exotischen Käfer, 1894, t. 3. f. 32, and 1895, p. 20; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 157; id. in Mission Babault Ind. Carab. 1924, p. 8.

Head wide, rather flat, smooth, neck constriction obsolete in middle, fairly deep at sides, eyes rounded and moderately prominent ; labrum with the median lobe in advance of the outer ones, the two inner setæ placed together in a single pore, clypeus smooth, truncate in front, with a faint tooth on each side of labrum ; clypeal suture just visible, frontal impressions shallow, linear, not reaching neck constriction. *Prothorax* a third wider than head and a fourth wider than long, contracted in front, close to the obtuse front angles, apex widely emarginate, sides parallel, a seta (sometimes two) on each side in front ; median line and transverse impression very faint, basal channel very deep, its border thickened at middle, foveæ small and rounded, lateral channel rounding front angle and forming a deep pore within it. *Elytra* dull, slightly wider than prothorax, not quite twice as long as wide, epipleura with a few fine punctures ; 8-striate, the striæ not impressed, but formed by large rounded punctures, becoming foveolate towards apex, 1 and 2, 3 and 4, and 6 and 7 usually joining at base ; intervals carinate, the odd ones a little thicker than the even ones and meeting at base, 2 and 4 finer and sometimes reduced to fine raised lines, not usually

reaching base, 7 not nearly reaching base, 4 and 7 not nearly reaching apex, 3 with a pore not far from apex. *Sternum*: prosternal process with two impressions, one behind the other, metasternal process with an impression on each side. *Venter* with transverse rows of few but very large punctures across the segments, and a deep irregular depression between the metacoxæ.

Length, 14–20 mm.; width, 4·25–6·25 mm.

BENGAL: Sahibganj, Rajmahal, and Giridih (Ind. Mus.). CHOTA NAGPUR: Konbir and Tetara (*Cardon*), Chakardharpur (*F H. Gravely*—Ind. Mus.). ORISSA: Barkul (*F H. Gravely*—Ind. Mus.). PUNJAB: Baddia (*G. Babault*). CENT. PROVINCES: Chitrakot (Pusa coll.); Jubbulpore, Motinala, and Majhgaon (*G. Babault*). BOMBAY: Belgaum (*H. E. Andrewes*); Kanara (*T R. D. Bell, P. F Gomes*—Bombay Nat. Hist. Soc. coll.). MADRAS: Ganjam, Lake Chilka, Barkuda I. (*N Annandale*—Ind. Mus.); Coimbatore (Coimbatore coll.); Vizagapatam (Brit. Mus. and Ind. Mus.); Chittoor distr., Horseley Konda (*E. Barnes*—Madras Mus.); Madura, Shembaganur; Malabar; Shevaroy Hills (Pusa coll.); Palni Hills (*F Andries*—Ind. Mus.); Nilgiri Hills, Kallar and Pillur (*H. L. Andrewes*), Ootacamund (Ind. Mus.). CEYLON: Anuradhapura (*N Annandale*—Ind. Mus.).

Type in the Copenhagen University Museum, that of *O. costatus* in Mr. R. Oberthür's collection.

163 *a*. **Oxylobus porcatus**, *F.*, var. **minor**, *Tchitch.*

Oxylobus costatus, Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 71; Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 469.
Oxylobus minor, Tchitcherin *, Hor. Soc. Ent. Ross. xxviii, 1894, p. 227.

The characters used by the author to differentiate his species from *O. costatus*, Chaud. (*O. porcatus*, F., not having been at that time identified) are very slight. He relied chiefly on the small size and the reduction in the number of punctures on the venter. I have not seen the type, but, after examining a number of specimens, I find these characters hold good, though I cannot regard them as indicating more than a small race of the species. The variety is uniformly smaller, and does not exceed 16 mm. in length, whereas the type-form averages about 20 mm. Tchitcherin's locality was "Indes Orientales," but all the specimens I have seen came from Ceylon.

Length, 15–16 mm.

CEYLON: Colombo (*G. Lewis*); Belihul-Oya; Weligama, Bentota, and Anuradhapura (*W Horn*); Vavuniya (*G. M. Henry*).

Type in the Museum of the Petrograd Academy of Sciences.

163 *b*. **Oxylobus porcatus**, *F.*, var. **obliteratus**, var. nov. [Plate VIII, fig. 2.]

As already mentioned, there is a tendency for intervals 2 and 4 to become reduced, and occasionally 4 disappears altogether, 2 remaining as a fragment only on the apical fourth of the elytra. These examples have such a different appearance that it seems desirable to give them a name, though in other respects they resemble the type-form.

MADRAS: Madura, Shembaganur.

Type in my collection.

164. Oxylobus pygmæus, sp. nov.

One of the smallest species in the genus. Closely related to *O. porcatus*, F., var. *minor*, but differing in its narrower form, smaller size, and in one or two other characters. The head is rather narrower, the clypeal suture much deeper, the sides behind somewhat densely punctate, a few punctures extending on to the vertex. On the prothorax, within the front angles, there is only a small elongate pore instead of a deep rounded one. The elytra are quite twice as long as wide, and intervals 2 and 4 are a little wider and more developed. The ventral surface bears nearly as many punctures as in *O. porcatus*.

Length, 13 mm.; width, 3·6 mm.

SOUTH MYSORE (*H. L. Andrewes*), 1 ex. "South India" (*W. Elliot*—Brit. Mus.), 2 ex.

Type in my collection.

165. Oxylobus lirifer, sp. nov.

Head wide and rather flat, front uneven, rather coarsely rugose-punctate at sides behind, vertex with a V-shaped impression and a fine line running obliquely backwards from the top of the V on each side to the frontal impressions, neck constriction fairly deep, eyes rather flat; labrum bisetose, the median lobe blunt and a little advanced, clypeus uneven, bidentate, its median part with a few longitudinal striæ; clypeal suture fairly deep in middle, fine at sides, frontal impressions linear, fairly deep, short and nearly parallel. *Prothorax* as long as wide, and about a fourth wider than head, nearly semicircular behind, apex widely emarginate, front angles rounded, sides nearly parallel, two setæ on each side in front; median line very fine, deeper close to base, basal channel deep, foveæ wanting, lateral channel rounding front angle, within which is a deep rounded pore, transverse impression distinct. *Elytra* barely as wide as prothorax and less than twice as long as wide, epipleura rather coarsely punctate; 8-striate, striæ very deep, dorsal ones with closely placed large rounded punctures, 1 to 5 free at base, 7 and 8 lying together

in the marginal channel; intervals forming rounded costæ, 1 a little and 3 a good deal wider than the rest, 6 carinate along inner margin, 7 very narrow and carinate throughout, not reaching extremities, 3 with a large pore not far from apex. *Sternum*: prosternal process lightly impressed, metasternal process smooth. *Venter* with numerous coarse punctures across each segment, the apical segment closely punctate. (In the Madras specimen there are two or three punctures only on each side of the segments, the central line being smooth.)

Length, 12 mm.; width, 3·6 mm.

BOMBAY: Ghozeh in the Belgaum district (*H. E. Andrewes*), 1 ex. MADRAS: Ramandrovy (Hamburg Mus.), 1 ex.

Type in my collection.

166. **Oxylobus alveolatus**, *Chaud.* [Plate VIII, fig. 3.]

Oxylobus alveolatus, Chaudoir *, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 134.

Head wide and flat, sides and back finely but not very closely punctate, neck constriction rather shallow, eyes (with genæ) moderately prominent; labrum with the three lobes fairly sharp, median lobe a little in advance, with a single pore bearing one seta (possibly two), clypeus smooth, median part emarginate, its sides a little advanced; clypeal suture more or less obsolete, frontal impressions linear, long, and fine, diverging a little at extremities. *Prothorax* a third wider than head, but only a little wider than long, apex widely emarginate, front angles rounded but evident, sides nearly parallel, rather sharply contracted close to front angles, two setæ on each side in front; median line very fine, even close to base, foveæ just visible, transverse impression faint, as is its continuation right up to the angle, within which is a deep rounded fovea. *Elytra* quite as wide as prothorax and twice as long as wide, basal area only slightly tuberculate, border widening out at shoulder into a blunt angle, epipleura with a few fine punctures; 8-striate, the striæ gradually deepening from within outwards, with closely placed, very large rounded punctures, which become somewhat transverse behind, 1, 2, and 5 free at base, 3 joining 4, 6 short, not reaching apical third, 7 and 8 lying together in the marginal channel; intervals forming rounded costæ in front and subcarinate behind, though 1 is flattened on basal half, 1 and 3 a little wider than the rest, 6 and 7 carinate, 4 and 7 not reaching base, 7 joining 6 rather behind middle, 4 not nearly reaching apex, 3 without pore behind. *Sternum*: a rounded pore on prosternum in front of the process, metasternum deeply depressed on each side. *Venter* with numerous coarse punctures across all the segments.

Length, 14·5–15·5 mm.; width, 4·2–4·5 mm.

ORISSA : Balasore (*Gengler*). MADRAS : Vizagapatam (Brit. Mus., Ind. Mus., and Genoa Mus.).

Type in Mr. René Oberthür's collection, without any precise indication of origin.

167 **Oxylobus bipunctatus**, sp nov.

Head rather flat, smooth between the impressions and at sides in front, punctate and with a few rugæ at sides behind, neck constriction distinct at sides, obsolete in middle, eyes (with genæ) fairly large, but not prominent ; labrum longitudinally striate, quadrisetose, the inner pair of setæ a little nearer to each other than to the outer ones, median tooth emarginate, so that the front margin has four short blunt teeth, clypeus striate at sides, transversely depressed at middle, emarginate in front, with a slight tooth on each side of labrum ; clypeal suture fine, frontal impressions short but fairly deep, not reaching neck constriction, sometimes with a few slight striæ at sides. *Prothorax* about a third wider than head and as much wider than long, widest at a third from base and gradually contracted in front, sides very narrowly bordered, with two setæ on each side in front, the pores sometimes indenting the border ; median line very fine, basal foveæ just visible, lateral channel fairly deep where it rounds the front angle, within which is a small rounded pore, transverse impression very clear, though shallow. *Elytra* just wider than prothorax and not quite twice as long as wide, epipleura punctate ; 8-striate, striæ chiefly formed by moderately large rounded punctures, hardly impressed on disk, and shallow even at sides and apex, free at base, 7 and 8 lying close together in marginal channel, 6 nearly reaching base, but ending long before apex ; intervals flat, 6 a little raised, 7 narrower than the rest and slightly carinate along inner margin, 3 rather wider than the others behind, with two pores at about two-thirds and five-sixths. *Sternum* : prosternum at sides and episterna with a few coarse punctures, metasternal process bordered by punctures. *Venter* with an irregular row of coarse punctures across each segment.

Length, 21–23 mm. ; width, 5·8–6·2 mm.

BOMBAY : Ratnagiri district, Dapoli. "Bombay."

Type (labelled " E. Ind.") in the British Museum ; cotypes in the Hope Department of the Oxford University Museum.

The specimen from Bombay, which is at Oxford, has only one puncture on interval 3. In the example from Dapoli, also at Oxford, the small rounded pore within the front angles of the prothorax is, on the left side, minute in size and placed behind the impression, while on the right side it is obsolete ; the row of punctures in stria 7 has quite disappeared. The specimen otherwise resembles the type, and has the two pores on interval 3, so that it appears to be an aberration only.

168. **Oxylobus foveiger**, *Chaud.* [Plate VIII, fig. 4.]

Oxylobus foveiger, Chaudoir *, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 133.

Head rather flat, smooth in front, a depression on each side of disk between the foveæ, neck constriction moderately impressed, with a number of coarse punctures (fewer at middle) along its course, together with one or two rugæ, eyes small and moderately prominent ; labrum bisetose, median lobe rounded and a little advanced, clypeus emarginate in front and transversely depressed, hind margin raised into a slight transverse ridge, which curves round on each side and ends in a tooth on each side of labrum ; clypeal suture and frontal depressions narrow and fairly deep, latter converging in front, extending between suture and neck constriction. *Prothorax* a fourth wider than head and as long as wide, sides parallel, a single seta on each side in front ; median line fairly deep, foveæ obsolete, lateral channel deep where it rounds the angle, within which is a deep rounded pore, transverse impression shallow. *Elytra* as wide as prothorax and twice as long as wide, epipleura with a few small punctures ; 7-striate, though with traces of another stria in marginal channel towards apex, striæ deep, with small or moderate rounded punctures, larger near apex, 1 to 5 free at base, though 3 sometimes joins 4 (as in type) ; intervals moderately convex, more convex near apex, nearly equal in width, 5 and 6 carinate on inner margin, 7 very narrow and carinate throughout, not quite reaching base and joining 6 behind, 3 without pore behind. *Sternum* : prosternum with one or two punctures on each side, pro- and metasternal processes smooth and without impressions. *Venter* with a single large pore on each segment at sides and an arcuate row on last segment.

Length, 11–13 mm. ; width, 3·2–3·6 mm.

MADRAS : Nilgiri Hills (*H. L. Andrewes*). MYSORE : Chikkaballapura (*T V Campbell*) and Bangalore (Brit. Mus., Oxford University Mus., and Ind. Mus.).

Type in Mr. René Oberthür's collection, without any precise indication of origin.

169. **Oxylobus rugiceps**, sp. nov. [Plate VIII, fig. 5.]

Head irregularly longitudinally rugose, but with vague areas on vertex and at sides of front, which, though smoother, are minutely punctate, coarsely punctate at sides behind and more sparsely across vertex, neck constriction distinct but not deep, eyes (with genæ) small and flat ; labrum bisetose, uneven, and considerably advanced, clypeus very uneven, widely emarginate in front, transversely impressed ; clypeal suture clearly

marked, frontal impressions linear and fairly deep, but somewhat obscured by the rugæ. *Prothorax* a third wider than head, barely wider than long, front angles rounded, sides straight and parallel, one seta on each side in front; basal foveæ obsolete, median line fine, though deep near base, lateral channel fairly deep where it rounds the front angle, a small but deep pore within it, transverse impression fine, crenulate at sides. *Elytra* as wide as prothorax, not quite twice as long as wide, epipleura punctate; 8-striate, the striæ on disk deep and deeply punctate, almost foveolate towards apex, all free at base, where 6 joins 7-8, which lie close together in the marginal channel, 6 not nearly reaching apex, 3 to 5 joining before apex; intervals rather flat on disk, but almost carinate at apex, 4 and 5 somewhat, 6 distinctly carinate on inner side, 7 narrow, strongly carinate, shortened at each end, 3 rather wider than the rest, without pore behind. *Sternum*: prosternal process with a rounded depression, metasternum smooth. *Venter* coarsely and irregularly punctate.

Length, 13–14·5 mm.; width, 3·9–4·2 mm.

BOMBAY: Belgaum (*H. E. Andrewes* and *N. B. Kinnear*); Kanara (*T. R. D. Bell*).

Type in my collection; two cotypes in the British Museum, and one in the collection of the Bombay Natural History Society.

I have a note that the species was common at Belgaum from June to September, 1886, taken sometimes under stones and sometimes under dung, one example being taken in January. Mr. Kinnear took a single specimen on 5. ix. 1910.

170. **Oxylobus asperulus**, *Chaud.* [Plate VIII, fig. 6.]

Oxylobus asperulus, Chaudoir*, Bull. Mosc. 1857, ii, p. 58; id., Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 133; Andrewes, Trans. Ent. Soc. Lond. 1922, p. 245; id., Spol. Zeyl. xiii, 1924, p. 129.

Oxylobus quadricollis, Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 71.

Head smooth or sometimes minutely punctulate, some short deep striæ near back of eye (sometimes isolating a tubercle) and a few punctures, neck constriction very slight, eyes small and (with genæ) rather flat; labrum with median lobe hardly advanced, bearing a single pore, clypeus bidentate, median part emarginate, surface longitudinally striate; clypeal suture fine but distinct, frontal impressions short, deep, diverging behind, and reaching mid-eye level. *Prothorax* barely a fourth wider than head and about as much wider than long (♀), sides parallel or even a little dilated towards apex, slightly rounded in front, border fine, with a single seta (more rarely two) on each side in front; median line moderately deep,

basal foveæ small, faint, and rounded, lateral channel turning the angle very sharply, but not forming any pore within it, transverse impression rather faint. *Elytra* about as wide as prothorax and twice as long as wide, epipleura with a few punctures; 8-striate, but with striæ 7 and 8 lying together in the marginal channel, the striæ fairly deep and strongly punctate, sometimes foveolate at apex, a little deeper at sides and apex, 1 and 2 free at base, 3 generally joining 4, all except 6 reaching or nearly reaching apex; intervals convex, narrowing and subcostate close to apex, outer ones subcarinate on inner margin, 6 costate, 7 a fine carina, which joins 6 at some distance from apex, 3 with a pore at apical fifth (not always present). *Sternum* smooth. *Venter* punctate at sides, more or less smooth in middle, the punctures in rather irregular transverse rows, apical segment (♂ ♀) often with a rounded depression at middle.

♂. Head nearly as wide as prothorax, strongly asymmetrical, generally with more punctures at sides behind, the frontal impressions shorter, left side in front dilated, prolonged, and bent upwards into a rounded tooth, left lobe of mentum short, thick, and bent a little downwards; right mandible in a horizontal plane, carinate, with a large tooth on inner margin; left mandible strongly dilated at base, prolonged at apex and bent first upwards and then inwards, grooved on upper surface and sometimes bifid at apex, inner margin with a single tooth at middle, a short bifid tooth just below it, and another short bifid tooth near base. The mandibles at base are outwardly angulate or even dentate.

Length, 13·5–19 mm.; width, 4–4·6 mm.

MADRAS: Nilgiri Hills, Pillur, 2000 feet (*H. L. Andrewes*), Hulikal, 6000 feet (*A. K. W Downing*), Karteri Road (*Y R. Rao*); South Malabar, Dhoni Forest (*E. Barnes*); Palni Hills, Kodaikanal (*F H. Gravely, T V Campbell, Castets,* and *Newton*), Kukkal and Neutral Saddle, 5000 feet (*S. W Kemp*); Madura, Shembaganur; Chittoor district, Horseley Konda (*E. Barnes*); Shevaroy Hills, Yercaud (*T V Campbell* and *T. B. Fletcher*); Trichinopoly. MYSORE: Nandidrug (*T. V Campbell*). CEYLON: Colombo (*G. Lewis*), Diyatalawa (*T. B. Fletcher*), Henaratgoda and Peradeniya (*Uzel*), Nedunkeni and Boralesgamuwa (*G. M. Henry*).

Type in the Stettin Museum.

Specimens from the Palni Hills are wider and those from the Nilgiri Hills are both wider and a little longer than those from Ceylon. In some of these the median pore on the labrum is evidently bisetose, and the left side of the head in the ♂ forms a shorter and more rounded prominence, the left mandible also being bent back more suddenly; the striæ are sometimes shallower, and occasionally they widen out at apex, the

punctures becoming foveolate and the intervals carinate. This appears to be the most variable, as it is one of the commonest species in the genus.

The only species with which *asperulus* could be confounded is *quadricollis*, for in the former the inner stria in the marginal channel of the elytra is not always distinct, but the characters of the head render them readily distinguishable. In *quadricollis* the frontal impressions bend outwards and then again inwards to the neck constriction, while the sides behind are very distinctly punctate; only the left mandible in the ♂ is somewhat abnormal. In *asperulus* the frontal impressions diverge behind and cease at mid-eye level, the sides behind having generally only one or two very coarse punctures; in the ♂ the left mandible is strongly dilated and bent sharply upwards and inwards, the left side of the head being asymmetrical.

170 *a*. **Oxylobus asperulus**, *Chaud.*, var. **amyntas**, *Andr.*

Oxylobus amyntas, Andrewes* in Mission Babault Ind. Carab. 1924, 70, t. 1, ff. 2, 2 *a*, 2 *b*.

The specimens described under this name, though considerably larger than those of the type-form of *asperulus*, hardly constitute more than a variety or local race of that species. The head is rougher, more uneven and more striate both at sides and in front, the frontal impressions relatively narrower, the eyes (with genæ) longer, flatter, and more angulate in front. The prothorax hardly differs, but there are sometimes one or two punctures in the basal foveæ. The elytra have more rounded sides, the striæ are equally deep, and rather more strongly punctate, but not foveolate at apex, 3 and 4 not joining at base, the intervals on disk rather flatter and relatively wider, the epipleura closely punctate. On the venter the segments have an uninterrupted transverse row of punctures.

♂ with left side of head less produced in front, less reflexed, and more rounded, the left mandible bent less upwards and pointed at apex.

Length, 19–20·5 mm.; width, 5·3–5·75 mm.

CENTRAL PROVINCES: Majhgaon, Motinala, and Mukhi (all *G. Babault*).

Type in my collection.

The localities in which these specimens were taken are much further north than any recorded for *asperulus*, but Indian examples of that species are rather larger than those occurring in Ceylon, and the specimens in question are larger than those from the Palni and Nilgiri Hills.

171. **Oxylobus quadricollis**, *Chaud.* [Plate VIII, fig. 7.]

Oxylobus quadricollis, Chaudoir*, Bull. Mosc. 1855, i, p. 7; id., Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 130.

Head wide, surface smooth, with a series of short, deep, transverse striæ, mingled with punctures, extending along the sides of neck constriction, which is very faint, though just visible, at middle, eyes (with genæ) rounded, not prominent; labrum quadrisetose, the two inner pores small and very close together, median part of clypeus slightly emarginate, its sides forming a tooth on each side of labrum, its surface smooth; clypeal suture faint at sides, distinct across middle, frontal impressions fairly deep, first diverging a little and then contracting to the neck constriction, which they just reach. *Prothorax* barely wider than head, and not much wider than long, sides nearly parallel, front angles not much rounded, a single seta (sometimes two) on each side in front, placed on the inner edge of the border, though hardly breaking the outline; median line fine but distinct, basal foveæ obsolete, lateral channel fairly deep where it rounds the angle, within which there is no pore, transverse impression deep at sides and distinctly impressed across middle. *Elytra* as wide as prothorax, not quite twice as long as wide, base of epipleura rather coarsely punctate; 7-striate, but with traces of another stria sometimes visible in marginal channel towards apex, the striæ deep at sides only, strongly punctate, the punctures not increasing in size at apex, all free at base (though 3 and 4 approach, and exceptionally join), 3, 4, and 5 generally joining before apex and 6 disappearing further back; intervals 1 to 3 rather flat and continuing so to apex, 4 to 6 becoming gradually more convex, 5 and 6 subcarinate on inner margin, 7 a fine raised line, 3 with a pore at apical fifth. *Sternum*: prosternal process at sides and metasternal process vaguely bordered. *Venter* with rather small, scattered punctures, smooth along median line, base more or less longitudinally striate.

♂ with the head and prothorax wider than in ♀, head symmetrical, but with left mandible curved and bent a little upwards and inwards (though not nearly so much as in *asperulus*), dilated and outwardly subdentate at base, hollowed out externally, upper surface grooved, inner edge deeply emarginate, basal half with four short teeth, a very large tooth on right mandible fitting into the emargination in the left one.

Length, 16–20 mm.; width, 4·5–5·5 mm.

MADRAS: Nilgiri Hills, Ouchterlony Valley (*H. L. Andrewes*), Coonoor (*T. B. Fletcher* and *A. K. W Downing*), Gudalur (*E. E. Green*); Malabar.

Type in Mr. René Oberthür's collection.

Chaudoir distinguished this species from its congeners by the form of the paragenæ, to which—no doubt owing to the small number of specimens at his disposal—he attributed an altogether exaggerated importance. For the characters separating *quadricollis* and *asperulus*, see under the latter species.

172. **Oxylobus montanus**, sp. nov. [Plate IX, fig. 1.]

Head wide and flat, quite smooth in front, one or more rugæ behind between fovea and eye, together with a few coarse punctures, which do not extend on to vertex, neck constriction rather shallow, eyes rather flat and conspicuously enclosed in the genæ; labrum with median lobe rounded and a little advanced, bearing a single pore, clypeus with a well-developed tooth projecting on each side of labrum; clypeal suture faint, frontal impressions narrow, deep, converging in front, very shiny at bottom. *Prothorax* only a little wider than head, a fourth wider than long, sides parallel or even faintly dilated right up to the slightly rounded front angles, a single seta on each side in front; median line deep, basal foveæ present but inconspicuous, lateral channel deep, rounding front angle very sharply and forming within it a deep but not rounded fovea, which the rather shallow transverse impression leaves at a little above its lowest point. *Elytra* with basal margin widened out at shoulder and contracted behind it, where there is a slight sinuation, a row of tubercles across base, epipleura moderately punctate; 8-striate, the striæ with moderate rounded punctures, not larger at apex, 1, 2, and 5 free at base, 3 joining 4, 7 and 8 lying together in marginal channel; intervals convex, much more so at sides and apex, 3 a little wider than the others, 5 slightly and 6 distinctly inwardly carinate, 7 narrow and strongly carinate, not reaching base, and joining 6 behind, 3 with two pores, one at apical third and another close to apex. *Sternum*: prosternum coarsely punctate at sides, depressed between procoxæ; metasternum depressed at base. *Venter* with a row of coarse punctures across each segment.

Length, 12·5–14·5 mm.; width, 3·6–4 mm.

Madras: Anaimalai Hills, 4000 feet (*T. B. Fletcher*), 3 ex.

Type in the British Museum.

The surface in this species is rather duller than is usual in the genus.

173. **Oxylobus nanus**, sp. nov.

Head wide and flat, smooth, but with four or five coarse, partly confluent punctures behind between fovea and eye,

neck-constriction evident at sides only, eyes small and flat; labrum with median lobe wide, subtruncate, a little advanced, with a single large central pore, clypeus somewhat uneven, with a distinct tooth on each side of labrum; clypeal suture distinct in middle, vague at sides, frontal impressions short, narrow, fairly deep, parallel, continued to front of clypeus, but not reaching neck constriction behind. *Prothorax* a little wider than head and about a third wider than long, widest at about middle, apex rather strongly emarginate, front angles moderately rounded, sides nearly parallel, with a single seta on each side in front on the border, just indenting the outline; median line very fine, basal foveæ obsolete, lateral channel not very deep, but deepening round front angle, transverse impression deep and uniform from angle to angle, hardly sensibly deeper and without trace of pore within the angle. *Elytra* as wide as prothorax, twice as long as wide, base tuberculate at sides, epipleura finely punctate; 8-striate, the striæ only lightly impressed on disk, deeper at sides and apex, with moderate rounded punctures, a little smaller and shallower behind, 1, 2, and 5 free at base, 3 joining 4, 7 and 8 lying together in marginal channel; intervals almost flat on disk, subcostate behind, 6 carinate along inner margin, 7 narrow and carinate throughout, 3 with two setiferous pores near apex. *Sternum*: prosternum with two or three coarse punctures on each side, prosternal process very gently declivous behind, a crescent-shaped impression on the declivity; metasternal process vaguely bordered. *Venter* wanting.

Length, 12 mm.; width, 3·1 mm.

MADRAS: Nilgiri Hills.

Type in the British Museum. The specimen is unique, and has the appearance of being worn, while the venter is missing. Nevertheless it presents a number of unusual features, and, as it seems easily recognizable, I have thought it desirable to give a description.

174. **Oxylobus lateralis**, *Dej.* [Plate IX, fig. 2.]

Scarites lateralis, Dejean*, Spec. Gen. i, 1825, p. 400.
Oxylobus lateralis, Chaudoir, Bull. Mosc. 1855, i, p. 8; id., Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 131.
Oxylobus sculptilis, Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 133.

Head smooth, sometimes with some fine irregular striation, a few striæ and punctures at sides behind adjoining neck constriction, which is moderately deep, eyes small, genæ hardly visible; labrum with the median lobe hardly advanced, the four setæ equidistant, clypeus just emarginate, distinctly striate; clypeal suture fine but visible, frontal impressions short, linear, parallel, rather deep in front, reaching neck

constriction. *Prothorax* half as wide again as head, barely wider than long, very gently contracted in front, sides nearly straight, but rounded behind front angles, a single seta (sometimes two) on each side in front, placed on the border, in which it habitually makes a distinct notch ; basal foveæ small and rounded, though only faintly impressed, lateral channel rounding front angle without forming any pore, transverse impression very faint. *Elytra* hardly wider than prothorax, not quite twice as long as wide, a few minute tubercles across base, epipleura with no or very few punctures ; 7-striate, though with the punctures of another stria often visible towards apex in the lateral channel, and occasionally a trace of a raised interval between the two rows, striæ narrow and very clearly cut, finely punctate or crenulate on disk, distinctly punctate at sides, while near apex the punctures become almost foveolate, all free at base, 2 and 3 often terminating a little behind base, 6 not reaching either base or apex ; intervals rather flat on disk, moderately convex at sides, costate at apex, 3 to 5 subcarinate on inner margin, 1 to 3 wider behind, all much narrowed near apex and (except 4) practically reaching it, 7 joining 6 at some little distance from apex, 3 without pore. *Sternum* : metasternal process with a sulcus on each side, not reaching extremity. *Venter* with a row of half a dozen large punctures across middle of segments, apical segment with few punctures, irregularly disposed.

Length, 13·5–19 mm.

BOMBAY : Poona. MADRAS : Palni Hills, Kodaikanal (*G. E. Bryant* and *Castets*) and base of hills (*S. W Kemp*) ; Nilgiri Hills, Kallar, 1000 feet (*H. L. Andrewes*), and Ootacamund ; Nagalapuram Hill, Chingleput (*E. Barnes*) ; Coimbatore ; Alagar Hills (Madura) ; Konankuppam (Arcot) ; Manaparai ; Varagambady (Salem) ; Trichinopoly (*C. Leigh*) ; Pondicherry ; Madura. MYSORE : Bangalore. CEYLON : Niroddumunai (*G. M. Henry*) and Kala Oya River.

Type in Mr. René Oberthür's collection.

Chaudoir had evidently not seen the type of *O. sculptilis*, Westwood, and could therefore have had no means of identifying it. The characters which he gives for separating that species from *lateralis* are very slight. The measurements of length given in the Monograph for the former species are 17–19 mm., and for the latter 13·5–16 mm. I have seen numerous specimens, practically all of them varying from 16 to 19 mm. The species seems to be more variable than usual, especially in the elytral striation, which differs much, both in depth and degree of puncturation. At the base the striæ are sometimes shortened, sometimes stria 1 turns outwards behind the row of tubercles, rarely 2 and 3 join at base ; the ground plan, however, remains constant, as does the notch

(exceptionally duplicated) in the border of the prothorax. Sometimes the intervals, instead of being flat, are moderately convex on disk and very convex at sides, and occasionally the two inner setæ on the labrum are placed much nearer to each other than to the lateral ones.

174 *a*. **Oxylobus lateralis**, *Dej.*, var. **designans**, *Walk.*

Scarites designans, Walker*, Ann. Mag. Nat. Hist. (3) ii, 1858, p. 203.

Oxylobus designans, Chaudoir, Mon. des Scaritides (i), Ann. Soc. Ent Belg. 1879, p. 133; Bates, Ann. Mag. Nat. Hist. (5), xvii, 1886, p. 210; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 186.

In 1919, when commenting on Walker's types, I described this species, and compared it with *lateralis*. After examining further material, I find that the slight differences then mentioned do not all hold good, and I think Walker's name should be restricted to those examples in which the striæ on the disk of elytra are impunctate. There seems to be no other constant character to differentiate the two forms, but it may be mentioned that in the cotype of *designans* the inner pair of setæ on the labrum are very close together on the base of the middle lobe (in the type there is a single large pore, placed asymetrically), while on the prothorax there are two setiferous pores on each side in front, placed in the marginal channel, and therefore not breaking the continuity of outline.

The *type* and a second specimen, both from Ceylon, are in the British Museum

174 *b*. **Oxylobus lateralis**, *Dej.*, var. **ingens**, var. nov.

This is an extreme form of the species, much larger than normal specimens. The head hardly differs, except for the rather more prominent eyes. The prothorax is more contracted in front, the sides and front angles much more rounded, the former with one seta (sometimes two) in front, the pores from which they spring not breaking the outline. The elytra differ in their striation, which is less clean cut, the striæ being uneven, sometimes crenulate, occasionally discontinuous, the lateral striæ impunctate or very finely punctate.

Length, 23–26 mm.; width, 6·75–8 mm.

BOMBAY: Poona (Oxford Mus.). MADRAS: Trichinopoly (*C. Leigh*—type); Tinnevelly, Koilpatti (Pusa coll.); Madura.

Type in my collection.

In spite of its very different appearance, this can hardly be regarded as a separate species, for examples occur which, both as regards size and the form of the prothorax, connect the variety with the type-form.

Oxylobus ovalipennis, *Andr.*

Oxylobus ovalipennis, Andrewes, Spol. Zeyl. xiii, 1924, p. 130.

Head strongly transverse and rather flat, surface smooth, with one or two striæ and punctures adjoining neck constriction, which is visible at sides only and not deep, eyes rounded and moderately prominent; labrum with median lobe much rounded, the inner setæ much nearer to the outer ones than to each other, clypeus faintly emarginate, with one or two striæ opposite frontal impressions; clypeal suture just visible, frontal impressions rather shallow, linear, parallel, uneven, reaching mid-eye level, though traceable further back. *Prothorax* a third wider than head and as much wider than long, distinctly contracted in front, apex somewhat emarginate, sides straight in middle, rounded in front, as are the angles, two setiferous pores on each side in front, placed inconspicuously in the lateral channel; median line fine but clear, basal foveæ obsolete, lateral channel shallow in front, just rounding the angle, without trace of pore, the transverse impression very faint. *Elytra* a little wider than prothorax, and about a half longer than wide (two-thirds as long again in original description), epipleura punctate at sides; 8-striate, but stria 7 is rudimentary, though entire, and enclosed with 8 in the marginal channel, the two rows of punctures separated by a fine line, raised on apical half, inner striæ nearly smooth, outer ones strongly punctate and all foveolate at apex, all free at base, 6 not nearly reaching apex; intervals moderately convex on disk, strongly convex at sides, 4 to 6 inwardly subcarinate, all more or less carinate behind, 3 to 5 not reaching apex, 6 costate, 7 very narrow and carinate throughout, joining 6 at some distance from apex, 3 without pore. *Sternum*: prosternum with a slight linear impression between coxæ; metasternal process with a short oblique sulcus on each side, not reaching extremity. *Venter* smooth at sides, a row of six or eight large punctures across middle of segments, last segment with an irregular row of a dozen punctures.

Length, 23 mm.; width, 6·25 mm.

CEYLON: Koggala.

Type in my collection; cotype in the Colombo Museum.

176. **Oxylobus rugatus**, *Bänn.*

Oxylobus rugatus, Bänninger*, Ent. Blätt. 1928, p. 64.

Head wide, surface closely and coarsely punctate, except along front and hind margins, sometimes vaguely longitudinally striate, more distinctly so at sides, neck constriction slight but evident, eyes (with genæ) moderately prominent, rounded;

labrum with median lobe rounded, the inner pair of setæ nearer to each other than to the outer ones, clypeus slightly emarginate and clearly striate, a distinct tooth on each side of labrum; clypeal suture and frontal impressions barely indicated. *Prothorax* a third wider than head, nearly as long as wide, slightly contracted near front angles, apex somewhat emarginate, sides straight when viewed from above, but actually a little emarginate, two setæ on each side in front, the pores from which they spring breaking the continuity of outline; basal foveæ represented by two slightly oblique or transverse lines. a slight transverse impression on each side of median line at base close to and parallel with basal channel, lateral channel rounding front angle without trace of pore, transverse impression moderately deep, sometimes rather shallower near the angles. *Elytra* barely wider than prothorax and rather less than twice as long as wide, epipleura with some punctures; 7-striate, but with traces of another stria in marginal channel behind, striæ moderately deep and strongly punctate, hardly foveolate at apex, all free at base, 6 not nearly reaching apex; intervals a little convex on disk, more strongly so at sides, outer ones hardly carinate, even behind, 3 and 4 joining behind and not reaching apex, 3 without pore. *Sternum*: metasternum punctate along side-margins, the two lines of punctures meeting in front. *Venter* with numerous punctures across the segments.

Length, 18 mm.; width, 4·75 mm.

MADRAS.

Type in coll. Bänninger.

177 **Oxylobus armatus**, sp. nov.

Head impunctate, with two rounded, though somewhat uneven, depressions on middle of front, separated by a slight ridge, one or two faint oblique rugæ at sides behind, neck constriction visible only at sides, eyes small, completely enclosed in the genæ, which extend beyond them and form an angle in front; labrum with median lobe rather rounded and a little advanced, a small depression at middle, the four setigerous pores equidistant, clypeus depressed at middle, a vague tooth on each side of labrum; clypeal suture rather faint, frontal impressions fine and narrow, deeper in front, diverging behind and just reaching site of neck constriction; mandibles rather sharp, striate, right one (♂ and both in ♀) developed outwards at base into an obtuse tooth, left one (♂) with two well-developed moderately sharp teeth on outer side at base, separated by an emargination. *Prothorax* rather wider than head, and nearly a third wider than long, widest at a third from base and contracted very slightly in front, the front angles gently rounded, a seta on each side in the marginal

channel, two on left side in the ♂; median line rather fine, basal foveæ indicated by one or two slight oblique rugæ, united across middle by a slight depression, behind which the basal channel is very shallow, lateral channel deepening gradually in front to the point where the angle is rounded, but forming no pore within it, transverse impression nearly obliterated. *Elytra* with shoulders well marked, the sides faintly sinuate behind them, the border not dilated at shoulder, basal area slightly tuberculate, the tubercles not extending inwards beyond interval 3, epipleura smooth; 7-striate, the striæ smooth to near apex, where they become punctate but not foveolate, and the surface is broken up into irregular

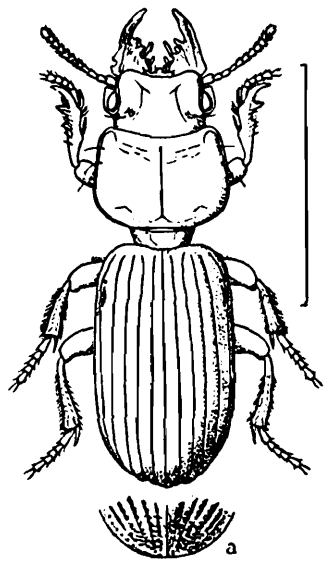


Fig. 45.—*Oxylobus armatus*, Andr., ♂.
(*a*) Apex of elytra.

rugæ, 1 to 5 free at base, where 2 turns a little outwards, 6 and 7 lying together in marginal channel, 6 impunctate, but the umbilicate pores forming 7 are broken up into two rows just behind shoulder; intervals equal, flat on disk, convex at sides, irregularly costate close to apex, 3 without pore. *Sternum*: all sterna smooth and impunctate, but the metasternal process is slightly bordered. *Venter*: segments smooth, a single normal pore on each side, last segment with an irregular transverse row of coarse punctures.

Length, 22 mm.; width, 6·6 mm.

MADRAS: Madura; Ramnad.

Type (♂) from Madura is in the Hungarian National Museum, Buda-Pest; cotype (♀) in my collection; a ♂ example from Ramnad is in Mr. Bänninger's collection.

The species presents many unusual characters, but there seems no reason to exclude it from the genus. The surface of the head, as described above, is that presented by the type, but in the other specimens the head is nearly smooth.

I have been unable to identify the following species :—

Oxylobus (*Scarites*) *sculptilis*, Westwood, Arcana Entom. i, 1843, p. 88, t. 23. f. 1 ; Chaudoir, Bull. Mosc. 1855, i, p. 9 ; id., Mon. des Scaritides (i), Ann. Soc. Ent. Belg. 1879, p. 133 ; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 210 ; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 180.

" This species is elongated and black. The head is wanting in the only specimen I have seen. The pronotum is subquadrate, with the hind angles rounded off, and with a longitudinal central sulcus ; the elytra are oblong subovate, each with five deep, simple striæ, of which the second and fifth, and the third and fourth are united together at the tips, where they are dilated and where the spaces between the striæ are marked with deep impressed round punctures ; there is also a fine raised submarginal line, outside of which is a row of minute punctures.

" Length of body (head omitted) 7½ lines, width of elytra almost 3 lines. Museum of the Linnean Society, London. Inhabits Van Diemen's Land."

Chaudoir considered the species as being near *lateralis*, Dej., and possibly identical with *designans*, Walk., but Bates did not share this opinion. I have sought in vain for the type, not only in the Linnean Society's Museum, but in the British Museum and at Oxford. It seems to me quite useless to speculate further as to its identity.

One species of the genus has been described by Tchitcherin as coming from Tonkin, and the description was founded on a single specimen. No examples have been met with elsewhere in Indo-China, or even in Burma. In view of the fact that I have from time to time acquired insects bearing a Tonkin label, but which in fact must have come from Southern India, I feel sure that a similar mistake has been made here, but I am unable, from the description, to identify the species with any of those described in the preceding pages. I therefore append a translation in order to facilitate its recognition if and when found.

" *Oxylobus dissors*, Tchitcherin, Hor. Soc. Ent. Ross. xxviii, 1894, p. 224.

" Length 19·5 mm. *Head* of medium size, square, wider than long ; its sides in front of the eyes at first almost straight, slightly divergent, then forming an angle fairly well marked but rounded, and thence directed forwards a little obliquely towards the sides of the clypeus, with just a trace of emargination ; the eyes are extremely convex and prominent ; if they are examined carefully, a fine blackish border may be seen round their outer margin, produced by the projection of the genæ, which are much developed and completely enclose

the underside of the eye; the clypeus is approximately truncate, crossed on each side by the end of the frontal furrows; there is an oblong impression on the middle of the clypeus; frontal furrows nearly straight and parallel (diverging slightly forwards on the clypeus), deeply impressed; the space which separates them is not very convex, and is impressed with two fairly large punctures; the interval separating them from the eye is distinctly convex, longitudinally striate near the vertex, from which it is separated by a strongly marked groove, which reaches approximately the hind end of the frontal furrows; on each side of this groove are a few sparse punctures; all the upper surface of the head is very finely punctate, almost shagreened; mandibles of medium size, about as long as the head, the inner carina slightly sinuate, the space between it and the outer carina indistinctly grooved, the teeth on the inner margin rather strongly carinate above, denticulate within, the denticulations (3–4) very unequal; paragenæ simple, without tooth or emargination along their inner margin; antennæ moniliform, joint 1 approximately as long as the next three taken together.

"*Prothorax* about half as wide again as the head without the eyes, a little wider than long, contracted in front, apex very slightly emarginate, front angle not projecting and very widely rounded, sides slightly rounded behind them as far as a slight indentation arising from a fairly large piliferous pore placed on the lateral border at about the apical fourth, thence straight and diverging a little behind up to a point a little in front of the hind angles, then strongly rounded in a regular curve to the peduncle, hind angles completely effaced, with a piliferous pore on their site; disk fairly convex, regarded transversely, and very smooth, median line fine but clearly marked, reaching the basal sulcus, not extending beyond the front transverse impression, which is equally deep throughout and terminates at each end in a deep and fairly large smooth pore, lateral channel rounding the front angles and appearing very narrow, border narrow in front, but becoming thicker from the hind angles to the peduncle, a slight, rounded, smooth depression on each side of the base.

"*Elytra* hardly wider than the prothorax, a little longer (about 2 mm.) than the front-body, elongate-oval, almost truncate at the base, shoulders completely effaced, without tooth, sides faintly rounded; upper surface, regarded transversely, very convex, but, regarded longitudinally, depressed up to two-thirds, then becoming convex and rapidly declivous to apex, which is somewhat obtusely rounded; striæ deep, strongly punctate (subcrenulate), and, narrow in front, becoming much wider towards apex, where, from about three-fourths, the intervals, up to that point wide and merely convex, are quickly transformed into narrow carinæ separated by wide

grooves, each with a row of closely-placed foveæ; the outer intervals are less convex than the inner ones, especially the sixth, which is a little more raised than the others and joins the cariniform extremity of the second along the hind margin, the third almost touches the inwardly-curved end of the sixth, the fourth disappears not far away, the fifth is interrupted further back, at approximately the level at which the intervals become carinate, the seventh is in the form of a fine raised line, which begins a little behind the shoulder and ends at about three-fourths, on the ninth, which is very narrow, is an uninterrupted series of umbilicate pores; the large foveæ at the ends of the striæ are found only in the first five, the sixth having on its outer side only a series of punctures similar to those on the ninth, and a little more evident behind; the striæ do not reach the front margin, which is rugose.

"The underside of the body is smooth; there are no pores on the middle of the prosternum; on the middle of the intercoxal process there are some small irregular striæ; there are no foveæ between the mesocoxæ, but between the metacoxæ there are four piliferous pores; a row of more or less large foveæ, disposed partly in a double line, runs across each of the ventral segments from the third to the fifth; those on the anal segment are more numerous and irregularly disposed; the metepisterna are small, narrow, and fairly long.

"Tonkin, 1 ex.

"This species (the first to be discovered outside the boundaries of India and Ceylon) differs at first sight from *O. quadricollis*, Chaud., *punctatosulcatus*, Chaud., *lateralis*, Dej., *asperulus*, Chaud., and *sculptilis*, Westw., in having foveæ at each end of the front transverse impression; it differs from *O. foveiger*, Chaud., *alveolatus*, Chaud., and *costatus*, Chaud., in having a distinct indentation on the sides of the prothorax at their apical fourth."

Subgroup III. *PASIMACHIDES.*

A comparatively large subgroup, represented in America by the genus *Pasimachus* and in Australia by a large number of both genera and species. In our region it is confined to the large and handsome genus *Mouhotia*, the three species of which occur only in Burma, Siam, and Indo-China. In the majority of the genera there is on each side of the head a single supraorbital seta, which is wanting in *Mouhotia*, and other characteristics of this genus are the comparatively long and slender mandibles, which, when normally closed, do not overlap at the base, the securiform apical joint of the palpi, and the brilliant red or green margin of the prothorax and elytra.

Genus MOUHOTIA

Mouhotia, Castelnau, Rev. et Mag. Zool. (2) xiv, 1862 (Aug.), p. 305 ; Pouillaude, Insecta, iv, 1914, p. 327.
Scaritarchus, Schaum, Proc. Ent. Soc. Lond. 1862 (Sept.), p. 94.

TYPE, *Mouhotia gloriosa*, Cast. (Laos.)

Body apterous. *Head* large, quadrate, flattened in front but convex behind, front angles obliquely truncate, clypeus glabrous, its front margin truncate, frontal impressions shallow, no neck constriction ; labrum very short and wide, with some irregular transverse striæ ; eyes small, flat, deeply embedded, widely separated from buccal fissure, without groove for reception of joint 1 of antennæ, without supraorbital pores, genæ inconspicuous, shorter than eyes ; mandibles rather slender, not normally overlapping at base when closed, with a small tooth at middle of inner margin, striate on both upper and lower surfaces, a carina extending from outer basal angle to tooth on inner margin ; ligula rather wide, its upper surface densely setose, apposed to under surface of labrum, apex thick, with a pore containing two minute setæ at middle on the lower side of its nearly vertical face, the lower margin bisinuate, meeting tooth of mentum at middle, each side forming the front half of an orifice into which fits joint 1 of the labial palpi, the emargination at each side of tooth of mentum forming the posterior half, paraglossæ adnate, with a dense tuft of hairs at apex ; mentum wide, bordered, with a comparatively small emargination, sides and apex of lobes rounded, tooth a little shorter than lobes, deeply sulcate and bent upwards at apex, paragenæ edentate ; buccal fissure not extending beyond base of mentum, maxillæ slightly curved, obtuse at apex, densely fringed with hairs on inner and apical margins, outer lobe jointed and longer than inner one ; palpi short but stout, maxillaries glabrous, joint 2 quite half as long again as 3 and 4, which are equal in length, 4 securiform, though somewhat rounded at apex, a little longer than wide, labials with joint 2 twice as long as 3, inner margin of 2 with two minute setæ placed together in a single pore, 3 securiform, slightly rounded at apex and rather wider than long ; antennæ pubescent from joint 5, but joints 5 to 7 are less densely pubescent than the apical ones, not quite reaching base of prothorax, joint 1 a little longer than 2+3, the other joints about equal in length. *Prothorax* convex, cordate, transverse, strongly contracted behind, base and apex both emarginate. *Elytra* short, ovate, convex, pointed at apex, shoulders rounded, epipleura wide, not suddenly contracted behind ; 9-striate, excluding marginal channel, some of the striæ duplicated, chiefly behind, the marginal series of pores disappearing before apex, no scutellary striole and no setiferous dorsal pores. *Sternum* : pro- and metasternal processes unbordered, met-

episterna rather wider than long. *Venter* glabrous, minutely rugose at sides and apex. *Legs* comparatively long and slender; protibiæ sulcate on upper surface, apical digitation as long as spur, a tooth on the digitation; mesotibiæ with a sharp tooth just below middle and another at apex; tarsi with the joints dilated at apex, 1 as long as the next three taken together.

Range: Burma, Siam, Laos.

The species of this genus are among the largest and most striking of the Carabidæ, the colour black, with a margin of brilliant metallic green or copper on both prothorax and elytra. The first species described, *M. gloriosa*, Cast., from Laos, has apparently never been found since, though a variety of it from Siam has been described under the name of *M. planipennis* by Mr. Pouillaude, to whom we are indebted for an account in 'Insecta' of both genus and species. Mr. George Lewis described two further species, viz. *M. convexa*, also from Laos, and the Burmese species, which is redescribed below.

A remarkable character is the absence of nearly all tactile setæ on the body, connected, no doubt, with the mode of life, about which very little is known. Mr. Lewis writes:—"If I rightly understand the habits of these insects, they live much as *Craspedonotus* does in China, on the banks of the Yang-tsze; they burrow into the banks of rivers which run through large alluvial plains, and then sit watching for prey at the orifices of their holes. To find *Craspedonotus* in China, you must follow up the Yang-tsze for 500 or 600 miles, when the soil becomes light and sandy. Near Shanghai all is mud, and it is the same on all large rivers near the mouth. The Cambodia river as far as Saigon is too muddy for large Scaritidæ."

178. **Mouhotia batesi**, *Lewis*. [Plate I.]

Mouhotia batesi, Lewis, Ent. Month. Mag. xv, 1879, p. 186; Waterhouse, Aid to the Ident. of Ins. xvi, 1883, t. 125. f. 3; Pouillaude, Insecta, iv, 1914, p. 329.

Colour black; sides and base of prothorax and sides of elytra with a brilliant cupreous margin.

Head with clypeus truncate, its sides receding a little and faintly emarginate, its median part, along with middle of front, forming a small convex boss, clypeal suture obsolete in middle, deep at sides, though not reaching margin, ending in a transverse pore on each side of the boss, frontal impressions faint and inconspicuous, striate behind, surface moderately smooth, with some fine transverse striæ in front and longitudinal ones behind. *Prothorax* half as wide again as head and as much wider than long, base and apex both rather deeply emarginate,

base much narrower than apex, front angles advanced and slightly rounded, sides explanate, with a thick border, strongly rounded in front, sinuate close to hind angles, no lateral pores or setæ, hind angles slightly obtuse and rounded; median line very fine, transverse impressions moderately deep, though the front one is rather faint at middle, where a few small punctures are visible, surface nearly smooth on disk, sides with some coarse striæ, chiefly on front half, the cupreous margin wide, especially in front, occupying altogether quite half the surface. *Elytra* barely wider than prothorax, a half longer than wide, border much narrower than that of prothorax and slightly sinuate before apex; striæ moderately deep, with closely-placed rather shallow punctures, which continue to apex but become gradually shallower, the rows of punctures in 8 and 9 duplicated immediately behind shoulder, in 6 and 7 soon after middle, and in the remainder rather vaguely towards apex; intervals flat close to base, convex on disk, subcostate behind, though quite flat again close to apex, 9 forming a carina over the shoulder, which is interrupted at basal fourth, marginal channel wide, containing a number of punctures in addition to the normal series; surface nearly smooth, the cupreous margin rather narrow behind, widening in front and spreading over the shoulder. Microsculpture formed by isodiametric meshes, which are finer and less distinct on head and prothorax than on elytra.

Length, 43–46 mm.

BURMA: Rangoon and Moulmein (Brit. Mus.), Dawna Hills, Thaungyin Valley, Downdani Valley (*C. T. Bingham*). SIAM.

Type in Mr. René Oberthür's collection.

Subgroup IV *SCAPTERIDES.*

Two genera are included here, but Putzeys also put into the subgroup the South American genus *Listropus*, which should probably be excluded. Of our genera *Scapterus* is, so far as present indications go, confined to India and Burma, but *Thlibops* is found in various parts of South-East Asia, and seems to be particularly well represented in the Philippine Islands. Although the insects comprised in the two genera agree in their subcylindrical form and in various other characters, they are very different in facies, and can readily be differentiated.

Key to the Genera.

1 (2) Head with one supraorbital seta, eyes small but normal, visible from above, labial palpi with joint 2 a half longer than 3 — SCAPTERUS, p. 328.

2 (1) Head without supraorbital setæ, eyes either invisible from above or visible only in a narrow slit at sides of head, labial palpi with joint 3 a half longer than 2 — THLIBOPS, p. 334.

Genus SCAPTERUS.

Scapterus, Dejean, Spec. Gen. ii, 1826, p. 471; Putzeys, Mon. des *Clivina* et genres voisins, Mém. Liége, ii, 1846, p. 522; Lacordaire, Gen. Col. i, 1854, p. 197; Putzeys, Postscr. ad Cliv. Mon., Mém. Liége, xviii, 1863, p. 16, t. 1. ff. 16-18; id., Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 7.

TYPE, *Scapterus guerini*, Dej. (India and Burma.)

Form elongate, body winged. *Head* wide, clypeus bisetose, emarginate at middle, completely fused with the wings, an emargination between it and the frontal plates, middle of front occupied by an elongate tubercle, directed forwards over the middle of clypeus, surface more or less densely longitudinally striate; eyes not prominent, more or less enclosed by the genæ, distant from buccal fissure, with one supraorbital seta; labrum short but fairly wide, quadrisetose, with a median tooth, which is either truncate or slightly emarginate; mandibles about as long as head, moderately curved, bidentate, the basal tooth in the right one sometimes bifid, the upper surface more or less striate; ligula short, dilated and concave at apex, bisetose, adherent to tooth of mentum, ciliate on upper surface, paraglossæ very slender, also ciliate, and about as long as ligula; mentum moderately emarginate, with a sharp tooth as long as lobes, surface irregularly striate; maxillæ straight, rounded at apex, with a sharp slender hook a little below apex, inner margin densely ciliate up to apex, outer lobe very slender, jointed; palpi rather slender, rounded at apex, maxillaries with joints 2 and 4 about equal, a little longer than 3, labials with joint 3 about two-thirds of 2, latter inwardly plurisetose; antennæ slight, barely reaching middle of prothorax, joint 1 about as long as the next three taken together, 5 to 11 flattened and becoming evidently transverse, 11 conical and quite as long as wide, pubescent from 5, the pubescence confined to the narrow sides, the flattened sides quite smooth. *Prothorax* convex, square, bordered throughout, without any lateral setæ; median line moderately deep, front transverse impression deep, basal foveæ short, deep, oblique, running from a point midway between median line and hind angle in the direction of front angle, surface smooth or punctate. *Elytra* subcylindrical, base truncate, with a smooth vertical declivity; 9-striate, the striæ coarsely punctate, a minute scutellary striole usually present on the extreme base of interval 1, intervals convex, 9 an exceedingly fine raised line. *Sternum*: prosternum

laterally compressed into a blunt keel, often with some transverse ridges across its apex, the process unbordered and sharply declivous behind; metepisterna elongate, moderately contracted behind, and more or less smooth. *Venter* with segments 3 to 6 rugose, 4 to 6 transversely sulcate, 3 and 4 each with a transverse row of setiferous pores, not reaching sides, 6 with a single marginal pore on each side. *Legs* adapted for digging; profemora strongly dilated; protibiæ with a long, curved, apical digitation, and three well-developed teeth on outer margin between it and base, mesotibiæ with a tooth near middle of outer margin and a spur between it and apex, metatibiæ produced externally at apex into a sharp tooth; protarsi with joint 1 as long as the other four joints taken together.

Range. India, Burma.

The form of these insects is reminiscent of that of some of the large genera among the Bostrychidæ. Nothing is known of their habits, and, except for the fact that one or two have flown to light in the evening, I have no note as to where they were captured. The specimens which have come to this country are frequently covered with sand or dirt, and, although in fresh or immature examples the tubercle on the head and the tips and teeth of the mandibles are very sharp, in the majority of specimens these parts get worn down or even broken.

Key to the Species.

1 (4)	Prothorax coarsely and irregularly punctate.	
2 (3)	Prothorax with median part of base evidently emarginate at middle and angulate at sides, elytra deeply striate but not sulcate, average length 17 mm.	*guerini*, Dej., p. 330.
3 (2)	Prothorax with median part of base very faintly emarginate at middle and rounded at sides, elytra sulcate, average length 13·5 mm.	*sulcatus*, Putz., p. 331.
4 (1)	Prothorax impunctate.	
5 (8)	Prothorax with both front transverse impression and basal foveæ deep, the latter elongate and oblique, length not less than 17 mm.	
6 (7)	Head with the genæ projecting laterally beyond eyes, elytra with gently rounded sides, the shoulders dentate, average length 17·5 mm. . .	*riparius*, Gestro, p. 332.
7 (6)	Head with the genæ not projecting laterally beyond eyes, elytra with parallel sides, the shoulders not dentate, length 22 mm.	*stevensi*, sp. nov., p. 333.
8 (5)	Prothorax with both front transverse impression and basal foveæ faint, the latter rounded, length 13 mm.	*crenatus*, F., p. 332.

179. **Scapterus guerini,** *Dej.*

Scapterus guerini, Dejean, Spec. Gen. ii, 1826, p. 472; Dejean et Boisduval, Icon. et Hist. Nat. i, 1830, p. 204, t. 22. f. 3; Gray in Griffith's Anim. Kingd. xiv, 1832, p. 201, t. 8. f. 3; Brullé in Audouin et Brullé, Hist. Nat. v, 1835, p. 64; Guérin, Icon. Règne Anim. 1844, Ins. p. 21, t. 5. f. 3; Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. 1867, p. 9; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 274.

Colour black.

Head wide, clypeus very short, surface somewhat irregularly and fairly closely longitudinally striate, neck nearly smooth, a well marked elongate tubercle on middle of front, projecting slightly over clypeus, eyes projecting very little, the genæ enclosing them to some extent behind, but not projecting so far laterally. *Prothorax* about a fourth wider than head and as long as wide, base truncate at sides, with a moderately deep emargination at middle, which is obtusely angulate at sides, apex slightly but widely emarginate, front angles dentate and projecting forwards, sides parallel, with a fine, faintly crenulate border, hind angles sharply rounded; median line moderately deep, front transverse impression and the channel within the basal border both deep, and both broken up by a series of minute longitudinal ridges, basal foveæ rather short and wide, uneven, diverging a little forwards, an irregular row of coarse punctures extending on each side between them and front angles, surface otherwise smooth. *Elytra* as wide as prothorax and twice as long as wide, rather sharply rounded at apex, shoulders without tooth, sides finely bordered, crenulate, almost parallel, though faintly dilated behind middle; striæ fairly deep, punctate, intervals convex, much more convex at sides, their surface rather broken up near apex, 8 carinate on basal half, 9 very narrow, commencing behind shoulder and joining 8 before apex, no dorsal pores.

Length, 15–19 mm.

United Provinces: Dehra Dun. Punjab: Chichawatni (*R. N Mathur*). Burma: Teinzo (*L. Fea*); Rangoon.

Type in Mr. René Oberthür's collection.

The type came from the "East Indies," and is 15 mm. long; three other examples examined are larger, and vary in length from 17 to 19 mm. An example in the Hope Department of the Oxford University Museum, labelled "India," is reputed to have come from Central India, and was collected by Gen. Hearsey.

Two specimens in the British Museum from N.W India and N. India (*H. Roberts*) are more roughly sculptured than the type-form, the elytral striæ deeper, but the intervals, though more convex, are not costate; in the second specimen the elytra are unusually short.

180. **Scapterus sulcatus**, *Putz.* [Plate IX, fig. 3.]

Scapterus sulcatus, Putzeys, Postscr. ad Cliv. Mon. p. 17; Chaudoir, Rev. et Mag. Zool. 1863, p. 117; Putzeys, Rév. Gén. des Clivinides, p. 9.

Scapterus figuloides, Gestro, Ann. Mus. Civ. Gen. xviii, 1882, p. 301, fig.; Andrewes, Ann. Mag. Nat. Hist. (10) ii, 1928, p. 586.

The species was described by both Putzeys and Chaudoir in the same year, under the same name, and apparently from the same specimen, but neither author refers to the description of the other one. Priority has, however, been accorded to Putzeys, and my enquiries have not shown this to be inaccurate.

The differences between *guerini* and *sulcatus* are inconsiderable. The latter, like the other species of the genus, is usually black, but castaneous or dark red examples are not uncommon; possibly this may be due to immaturity. Compared with *guerini*, *sulcatus* is smaller and narrower. The head is rather more roughly sculptured and a little more finely striate, the striæ continued further back on the neck. In the prothorax the front angles are less advanced, the sides of the base not truncate, the angles at each end of the median part rounded, the punctures on the surface smaller, more numerous, and more scattered. The elytra are rather more than twice as long as wide, the striæ deeper, the intervals narrower and subcostate.

Length, 12–15 mm.

BIHAR: Pusa (*T. B. Fletcher*, *M. Hussain*, and *G. P. Pillai*); Chapra (*Mackenzie*); Sepaya; Dinapore. UNITED PROVINCES: Dehra Dun.

Type in Mr. René Oberthür's collection; that of *figuloides* in the Genoa Civic Museum.

There is an example of this species in the Indian Museum labelled "Nepal Terai, Singpal Garhi," and two examples in the Oxford University Museum, collected by General Hearsey, labelled "India," and said to come from Central India. The type of *figuloides* is much worn, but does not appear to differ from Bihar specimens. A Pusa example, taken at light, is apparently a deformed specimen of *sulcatus*; the prothorax is rather irregularly but deeply striate, and elytral interval 3 bears on each side a number of irregular non-setiferous pores.

Typical examples of this species and of *guerini* appear fairly distinct, but I have seen few specimens of the latter, and it may prove that there is actually only one species, of somewhat variable form and size.

181. **Scapterus crenatus**, *F.* [Plate II, fig. 3.]

Scarites crenatus, Fabricius, Ent. Syst. i (1), 1792, p. 95.
Scapterus crenatus, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 155.

This species, though a good deal smaller than *guerini*, presents most of its characters. The surface of the head is rather coarsely, longitudinally striate, the neck quite smooth, a low, elongate tubercle on the middle of front, not projecting over the clypeus, between which and the tubercle is a small declivous area, about equal in size to the clypeus, and limited behind by a transverse ridge. In the prothorax the emargination at middle of base is very faint, and the side-border is not crenulate; the front transverse impression is very faint, as are the basal foveæ, the latter being short and nearly round, the surface smooth and shining. The elytra are hardly as wide as the prothorax; the striæ, though not sulcate, are strongly punctate, the intervals convex, 3, 5, and 7 somewhat raised and joining behind.

Length, 13 mm.

"EAST INDIES."

Type in the Copenhagen University Museum.

Although I saw the type some years ago when I was in Copenhagen, I now find that my notes are rather inadequate, and the above description has been prepared with the assistance of additional information supplied by Dr. Henriksen.

182. **Scapterus riparius**, *Gestro.*

Scapterus riparius, Gestro, Ann. Mus. Civ. Gen. xviii, 1882, p. 299 fig.

Colour black.

Head wide, fairly closely longitudinally striate, the striæ extending furthe backwards at sides than in the middle, neck smooth, the elongate tubercle on middle of front rather small, eyes very small and flat, the genæ largely enclosing them both behind and beneath, and projecting laterally beyond them. *Prothorax* a fifth wider than head and as long as wide, sides of base truncate, its median part only slightly emarginate, apex faintly emarginate, the front angles projecting forwards on each side as a small tooth, sides parallel, the fine border vaguely crenulate, hind angles sharply rounded; median line fine, front transverse impression and the channel within basal border both fairly deep and both broken by a series of minute longitudinal ridges, basal foveæ short and wide, diverging forwards, uneven, surface impunctate, with a few vague transverse striæ. *Elytra* about as wide as prothorax and less than twice as long as wide, the shoulders slightly

dentate, sides with a fine border, which is minutely crenulate, more evidently dilated behind than in the other species ; striæ deep and punctate, intervals very convex, though not costate, 8 carinate on basal half, 9 very narrow, commencing behind shoulder and joining 8 before apex, no dorsal pores. The tooth and spur on the mesotibiæ and the produced apex of the metatibiæ are all strongly developed.

Length, 17–18 mm.

BENGAL : Rangamati, Chittagong Hill Tracts (*R. Hodgart*—Ind. Mus.). BURMA : Minhla (*G. B. Comotto*—type).

Type in the Genoa Civic Museum.

I have seen only two specimens. Of these the type, which is much damaged, has a relatively wider prothorax and shorter elytra than the Chittagong example ; the characters of the head are all taken from the latter.

183. **Scapterus stevensi**, sp. nov. [Plate IX, fig. 4.]

Colour black.

Head wide, closely striate, the striation rather irregular, but chiefly longitudinal, and finer at middle than at sides, central tubercle large and smooth, the surface on each side of it very uneven, eyes flat, not conspicuously enclosed by the genæ. *Prothorax* fully a third wider than head and slightly wider than long, middle of base rather faintly emarginate, apex widely and slightly emarginate, sides parallel, with an evidently crenulate border, curving sharply inwards close to front angle, which projects forwards, hind angles sharply rounded ; median line fine, front transverse impression deep, broken by a series of minute longitudinal ridges, basal foveæ short, wide, uneven, diverging forwards, surface impunctate, with some vague transverse striation, more evident across base, the marginal area vaguely and finely rugose. *Elytra* as wide as prothorax and twice as long as wide, shoulders not dentate, sides parallel, scarcely dilated behind, with a finely crenulate border ; striæ deep, punctate, intervals strongly convex, 7 narrow and subcostate just behind shoulder, 8 carinate on basal half, 9 a very fine line, but traceable almost to apex. The apical digitation of the protibiæ is very long ; the metatibiæ are densely fringed with hairs along both inner and outer margins, but the tooth into which each of them is produced at apex is not much developed.

Length, 22 mm.

ASSAM : Silonibari, North Lakhimpur, at base of hills (*H. Stevens*).

Type in my collection.

Genus **THLIBOPS.**

Thlibops, Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 9.

TYPE *Scapterus longicollis*, Putz. (Senegal.)

Form elongate, body apterous. *Head* rather small but wide, flat in front, clypeus glabrous, with its median part and wings completely fused, separated from the small and rather inconspicuous frontal plates by a slight emargination, central area with a tubercle at middle, surrounded by a network of slight carinæ, which form more or less of a pattern, and behind this, at about mid-eye level, a slight furrow, which crosses the head from eye to eye (but is sometimes obsolete, or even wanting), neck convex and unconstricted; eyes deeply embedded in genæ, distant from buccal fissure, without supraorbital setæ; labrum small, short, and wide, projecting forwards at middle, with a pore and seta on each side, sides ciliate; mandibles short but stout, bidentate; ligula somewhat dilated at apex, adherent to tooth of mentum, paraglossæ free, rather wide, longer than ligula, densely ciliate at apex; mentum moderately emarginate, with a sharply pointed tooth, as long as lobes; maxillæ strongly hooked at apex, densely ciliate, except at apex, on both inner and outer margins, outer lobe jointed; palpi stout, cylindrical, rather rounded at apex, maxillaries with joint 4 twice as long as 3, labials with 3 a half longer than 2, which is plurisetose; antennæ very short, flat, pubescent on all faces from joint 5, barely reaching apical third of prothorax, joint 1 stout and somewhat longer than the others, 3 half as long again as 2 and 4, the rest transverse. *Prothorax* very convex, cylindrical, bordered throughout, but without any lateral setæ, hind angles quite rounded away; median line and front transverse impression generally deep, basal foveæ usually present, surface smooth or punctate. *Elytra* convex, elongate-oval, with an evident basal declivity, the border sometimes widened out and conspicuous in front of shoulders, which are generally rather square; 9-striate (inner striæ sometimes obsolete, but not in Indian species), stria 8 very narrow, scutellary striole wanting, intervals convex, sometimes seriate-punctate (not in Indian species). *Sternum*: prosternum with its episterna concave, carinate in front along median line, the process sulcate in front of procoxæ, unbordered and very gently declivous behind, metepisterna narrow and elongate. *Venter* generally punctate at sides, quite glabrous. *Legs* adapted for digging; profemora much dilated, lenticular; protibiæ wide, with three short stout digitations (including apical one) and an upper tooth (sometimes obsolete), mesotibiæ with an external apical spur and sometimes one or two

teeth above it; protarsi with joint 1 as long as 2+3+4, in meso- and metatarsi as long as 2+3.

Range. India, Burma, Pahang, Siam, Cochin-China, Java, Philippine Is., Senegal.

The species of which this genus is composed are singularly like one another in appearance, and differ widely from those of any other genus. The small head, with its patterned surface, very short antennæ, deeply embedded eyes, and cylindrical prothorax, are characteristic features. A more remarkable one is the almost complete absence of the usual tactile setæ all over the body; this probably indicates some unusual mode of life, but I have seen no note to give any clue to the habitat, and the life-history is quite unknown.

A table of all the species known to him was given by Dr. K. M. Heller in Phil. Journ. Sci. 1923, p. 29.

Key to the Species.

1 (4)	Prothorax punctate at least near front angles, front transverse impression punctate, basal declivity of elytra crossed by the striæ.	
2 (3)	Prothorax punctate at sides, basal foveæ deep, elytral intervals not striate at base.	*puncticollis*, Gestro, [p. 335.
3 (2)	Prothorax punctate within front angles only, basal foveæ shallow, each inner elytral interval at base with a short stria on middle	*filiformis*, sp. nov., [p. 337.
4 (1)	Prothorax smooth, front transverse impression impunctate, basal declivity of elytra not crossed by the striæ	*glaber*, sp. nov., p. 338.

184. **Thlibops puncticollis**, *Gestro.*

Thlibops puncticollis, Gestro *, Ann. Mus. Civ. Gen. xviii, 1882, p. 302; Heller, Phil. Journ. Sci. 1923, p. 297.

Colour black, shiny; palpi and antennæ more or less ferruginous.

Head: clypeus with its median part a little emarginate, a slight tooth projecting forward on each side; its sides sloping gently backwards, frontal plates small, bordered, and sharply rounded; sides with a longitudinal carina near eye, between which and central figure are two or three irregular carinæ, a transverse furrow of variable depth behind the central figure, with a slightly oblique stria running backwards on each side; eyes oblique, narrowed in front, almost entirely enclosed by genæ, which project laterally beyond them; surface generally rough and irregularly strigose. *Prothorax* a little more than a third wider than head, a fifth longer than wide, gently

narrowed in front and widest at basal fourth, apex truncate across middle, front angles somewhat advanced, rounded, sides appearing slightly rounded from above, but actually faintly emarginate; front transverse impression formed chiefly by pores, basal sulci short, straight, and deep; surface a little uneven, with some vague transverse striation and an irregular series of large punctures extending between front angles and basal sulci. *Elytra* not quite as wide as prothorax, and not quite twice as long as wide, border widened out a little above shoulder, but not conspicuous; striæ deep, continued across the basal declivity, punctate in front, becoming almost foveolate towards apex, 8 extremely narrow and hardly punctate, 9 also very narrow, with an uninterrupted series of very small umbilicate pores; intervals subcostate and

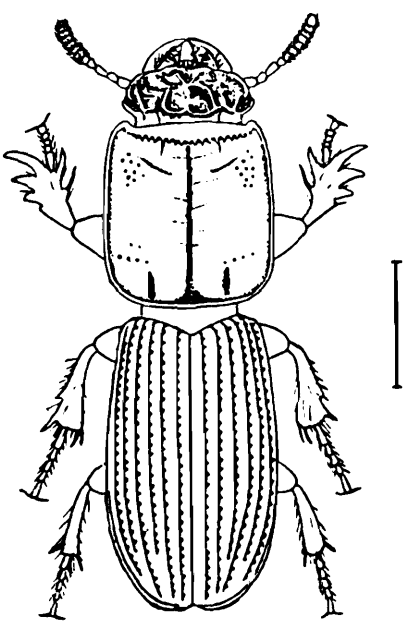


Fig. 46.—*Ihlibops puncticollis*, Gestro.

impunctate, 1 narrower than the rest, 8 curving round behind the others to apex, the other costæ narrowed behind, though not carinate, and not quite reaching apex, 9 a very fine carina, which does not quite reach base, and disappears at some distance from apex. *Sternum*: metasternum with a few punctures at sides, the episterna elongate, punctate. *Venter* with some fine, rather sparse puncturation at sides, last segment with coarse irregular punctures. *Legs*: protibiæ not sulcate on upper surface, with stout denticulations, the apical one curving downwards.

Length, 11–13 mm.

ASSAM (*W F Badgley*—Brit. Mus.); North Khasi (*Godwin-Austen*—Ind. Mus.). BURMA: Minhla (*G. B. Comotto*).

Type (Minhla) in the Genoa Civic Museum.

The Minhla examples are all 11 mm. long. In the Assam specimens the quadrate figure on the head is imperfectly defined, and the widened-out border of the elytra above the shoulders is more evident. In the British Museum example, which is 13 mm. long, the puncturation of the prothorax is confined to the neighbourhood of the front angles, and the venter is more closely punctate. These characters do not seem to be more than individual.

185. **Thlibops filiformis**, sp. nov.

Colour black, apical joints of antennæ brown.

Head: clypeus with median part bordered, emarginate, a tooth on each side of the emargination, frontal plates narrow, bordered, carinate, angulate in front; central area with a tubercle at middle, at which meet several vague carinæ, a slightly raised rounded area on each side behind the tubercle,

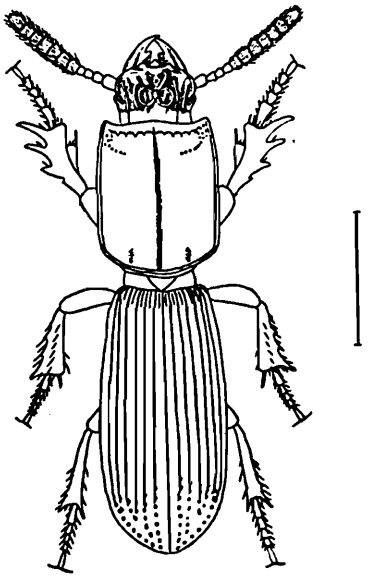


Fig. 47.—*Thlibops filiformis*, Andr.

each side of front with two or three irregular longitudinal carinæ, an irregular transverse groove across neck, containing some elongate punctures, a narrow groove running back from it on each side, and another short one at middle running forwards towards the tubercle; labrum without any pore on median lobe; eyes almost entirely enclosed by the genæ, which appear flat from above, but are produced beneath on each side into a deflexed flattened plate. *Prothorax* a half wider than head and a third longer than wide, slightly contracted in front and widest not far from base, apex truncate, with the angles a little advanced and rounded, sides nearly

straight, though (viewed laterally) a little emarginate, border narrow, a little thicker on apical half; front transverse impression rather deep, largely formed by coarse punctures, moderately distant from margin across middle, basal foveæ present but very lightly impressed, surface with a few slight transverse striæ and about a dozen irregularly disposed pores on each side within front angle. *Elytra* not quite as wide as prothorax, about two and a third times longer than wide, sides nearly parallel close to base, then slightly dilated, and widest rather behind middle, border at shoulder not very conspicuous; striæ deep, impunctate on basal three-fourths, punctate on apical fourth, crossing basal declivity, 1 to 4 free at base, 5 and 6 joining in front and again at apical fourth, continuing as a single stria to apex, 8 extremely narrow, joining 7 in front, disappearing behind long before apex, 9 narrow, marginal channel with a fine carina running along middle from base to apex just outside the series of umbilicate pores; intervals convex, impunctate, inner ones equal, each with a short stria on middle close to base, 8 finely carinate in front, widening behind and curving round to apex, 9 also a fine carina, joining 8 in front, disappearing before apex. *Venter* finely and uniformly punctate.

Length, 13 mm.

BOMBAY: Ratnagiri district, Dapoli (*Whithill*).

Type in the British Museum.

I have described this species with some hesitation, because some of the buccal organs have been removed, but the specimen is otherwise in a fair state of preservation, and its very narrow form, together with the other characters detailed above, will render it easily recognizable.

186. **Thlibops glaber**, sp. nov.

Colour black: palpi brown, antennæ and tarsi piceous.

Head: clypeus with median part emarginate, a tooth on each side of the emargination, frontal plates small, bordered, and sharply rounded; central area with a tubercle at middle, at which meet two sinuous carinæ, running backwards from the two teeth in front, a slight carina running back from the tubercle and separating two flattened oval areas, two longitudinal carinæ on each side, the outer one adjoining eye, the whole area separated from the convex neck by a faint transverse groove which has three small triangular incisions along its front margin; labrum with a pore, but no seta, on the median lobe; eyes moderately exposed, though much enclosed by the genæ behind, which (viewed laterally) extend as a sharp tooth beyond them. *Prothorax* fully a half wider than head, a fifth longer than wide, distinctly contracted in front

and widest near base, apex truncate, with the front angles slightly advanced and rounded, sides faintly emarginate, the border rather wider on apical half; front transverse impression moderately deep, uneven but not punctate, distant from margin across middle, basal foveæ evident but only lightly impressed, surface smooth. *Elytra* not quite as wide as prothorax, twice as long as wide, border at shoulder not very conspicuous; striæ deep and uniformly punctate, reaching, but not crossing, basal declivity, all free at base except 5 and 6, which join,

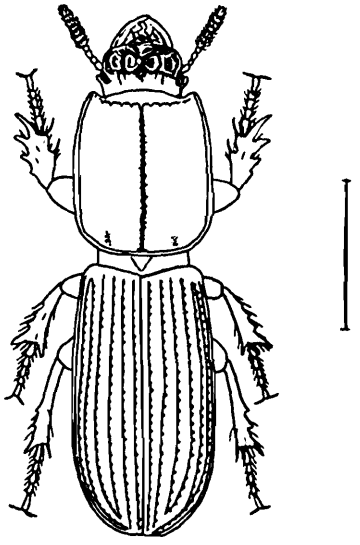


Fig. 48.—*Thlibops glaber*, Andr.

8 extremely narrow, impunctate, not nearly reaching apex, 9 narrow, with an uninterrupted series of small umbilicate pores; intervals convex, very convex near apex, impunctate, 1 rather narrow, 8 curving round behind the others, which gradually narrow behind, 9 a very fine carina, which reaches shoulder in front and disappears behind at apical fourth. *Sternum*: proepisterna finely punctate. *Venter* with a few small punctures at sides.

Length, 14 mm.

MADRAS: South Malabar, Parli.

Type in the British Museum. This is the only example seen.

Subgroup V *OXYSTOMIDES.*

In this subgroup are comprised four South American genera and one Indian one, the last-named represented by two species only. Putzeys also includes the genus *Dacca*, now added to *Clivina*, and the genus *Scolyptus*, with representatives in

Africa and Australia. Mr. T. G. Sloane long ago transferred Putzeys' Australian species of *Scolyptus* to *Clivina*. Of the African species I have seen only a solitary specimen, which must certainly be excluded from the subgroup, and is possibly also referable to *Clivina*.

The number of supraorbital setæ is variable, and in each of the two species of *Oxystomus* known to me there are as many as half a dozen on each side; the number of setæ on joint 2 of the labial palpi is also variable. In *Oxygnathus*, the Indian genus, there are two supraorbital setæ, but joint 2 of the labial palpi, which is long and exceedingly slender, is glabrous.

Genus **OXYGNATHUS**.

Oxygnathus, Dejean, Spec. Gen. ii, 1826, p. 473; Lacordaire, Gen. Col. i, 1854, p. 198; Putzeys, Postscr. ad Cliv. Mon., Mém. Liége, xviii, 1863, p. 5; id., Rév. Gén. des Clivinides, *Ann.* Soc. Ent. Belg. x, 1867, p. 23; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 274.

TYPE, *Scarites elongatus*, Wied.

Form elongate. *Head* large, subquadrate, transversely striate beneath, median part of clypeus and wings completely fused, frontal plates separated from clypeus by a shallow notch; eyes not prominent, removed from buccal fissure, with two supraorbital setæ, the second one placed far back at base of genæ, which are rather longer than and quite as prominent as eyes; labrum wide and very short, slightly emarginate, a large pore and seta at each extremity, sides densely ciliate, clypeus bisetose; mandibles very long, curved, sharp and slender (as in *Clivina forcipata*), slightly jagged at base; ligula moderately wide, bisetose, paraglossæ membranous, triangular, free; mentum transversely striate, with a very shallow sinus, an obtuse tooth as long (or nearly so) as the short lobes, which are subangulate externally at apex; maxillæ small, strongly hooked and very sharp at apex, outer lobe jointed; palpi very long and slender, apical joint tapering, maxillaries with joint 2 longer than 4, which is not quite twice as long as 3, labials with joint 2 very long and tenuous, glabrous, half as long again as 3; antennæ short, subgeniculate, pubescent from joint 3, joints 4 to 11 moniliform, joint 1 somewhat dilated at extremity, as long as the next three joints together, and lying in a groove between eye and buccal fissure. *Prothorax* convex, subquadrate, sides of base oblique, so that only the median part is in contact with the peduncle, sides with a deep lateral groove, each with two setæ. *Elytra* convex, epipleura more or less sulcate, border behind entire, seven punctate striæ (excluding marginal channel), scutellary striole rudimentary or wanting. *Sternum*: prosternal process rather

wide and flat, metasternal process bordered between meso-coxæ. *Venter* with the segments transversely sulcate, each (including apical one) with a single pore and seta on each side. *Legs* adapted for digging, protibiæ tridigitate (including apex) and with a small upper tooth, protarsi with joint 1 quite as long as the next three taken together, densely ciliate at sides, mesotibiæ crenulate, a spur near apex, metacoxæ contiguous, claws simple.

Range. Assam, Burma.

Key to the Species.

1 (2)	Prothorax without oblique sulcus on each side of base or distinct tooth at hind angles, elytra with parallel sides. Average length 9 mm. . . .	*elongatus*, Wied., p. 341.
2 (1)	Prothorax with an oblique sulcus on each side of base and a distinct tooth at hind angles, elytra oval. Average length 13 mm.	*aboranus*, sp. nov., [p. 342

187 **Oxygnathus elongatus**, *Wied.*

Scarites elongatus, Wiedemann *, Zool. Mag. ii, 1, 1823, p. 38.
Oxygnathus elongatus, Dejean, Spec. Gen. ii, 1826, p. 474; Dejean et Boisduval, Icon. et Hist. Nat. Col. Eur. i, 1830, p. 210, t. 22. f. 5; Brullé in Audouin et Brullé, Hist. Nat. Ins. v, 1835, p. 67; Putzeys, Postscr., p. 5, t. 1. f. 1; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 274; Andrewes, Trans. Ent. Soc. Lond. 1921, p. 168.

Colour black: legs and antennæ piceous, palpi brown.

Form elongate and parallel, as in *Clivina*. *Head* moderately convex, nearly as wide as prothorax, clypeus slightly emarginate, not bordered; frontal plates bordered, rather small, sharply rounded, not projecting laterally nearly so far as eyes and genæ; no clypeal ridge or suture, frontal impressions deep and narrow, diverging a little outwards at both extremities, extending forward a little beyond and enclosing clypeal pores, and backward to mid-gena level; facial carina strongly developed, with a deep groove on each side, the outer one duplicated behind and coarsely rugose-punctate, both reaching neck constriction, which is deep and entire; ligula triangular at apex, the middle angle produced into a long narrow tooth extending considerably beyond paraglossæ; surface smooth and polished. *Prothorax* not much narrower than elytra, a little longer than wide, apex slightly emarginate, a little contracted in front, lateral channel produced to front angles and along base, a hardly perceptible tooth at hind angles; median line deep, extending from base to front transverse sulcus, which is also deep, coarsely punctate, uninterrupted, and joins

the lateral sulcus at front angles, front lateral seta not far from apex, surface smooth, with a slight longitudinal impression near sides in front and another vague one on each side in front of base. *Elytra* with parallel sides, twice as long as wide, the shoulders projecting a little forwards ; striæ punctate and fairly deep, 1 to 3 free at base, 4 joining 5, striole rudimentary ; intervals moderately convex, especially near base, 3 with half a dozen setiferous pores adjoining stria 3, 8 sub-

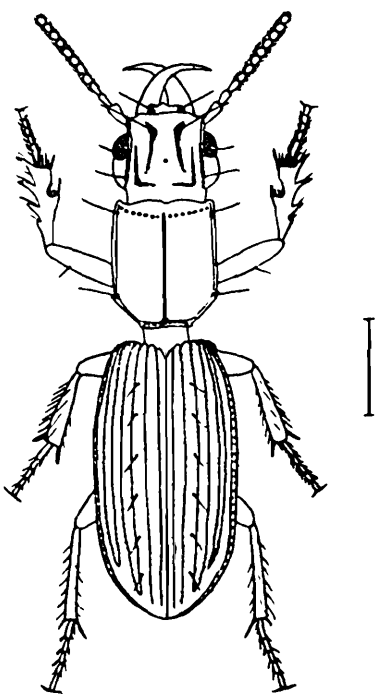


Fig. 49.—*Oxygnathus elongatus*, Wied.

carinate, not rounding shoulder. *Sternum* punctate along sides, mesosternum concave, metepisterna long and narrow. *Venter* punctate at sides and apex. *Legs* : protibiæ with a sulcus on upper surface.

Length, 7–12 mm.

BENGAL (type). BURMA : Prome, Paungde, Toungoo, Tharrawaddy, and Rangoon (all *G. Q. Corbett*) ; Palon (*L. Fea*).

Type in the Copenhagen University Museum.

188. **Oxygnathus aboranus**, sp. nov. [Plate IX, fig. 5.]

Colour black : palpi and antennæ ferruginous, legs piceous.

Form subelongate, as in *Oxylobus*. *Head* moderately convex, nearly as wide as prothorax, clypeus slightly emarginate, not bordered, eyes enchased, much smaller than genæ ; frontal plates convex, bordered, sharply rounded and not projecting laterally so far as eyes and genæ ; no clypeal ridge or suture, frontal impressions deep, straight, parallel, not extending

backwards beyond level of eye ; facial carina strongly raised, a deep groove on each side, outer one duplicated behind and somewhat rugose, neck constriction only just indicated at sides, a pore on middle of front ; apex of ligula only slightly produced into an obtuse tooth, hardly longer than paraglossæ. *Prothorax* very little narrower than elytra, a little longer than wide, slightly contracted in front, middle of base somewhat produced backwards, apex a little emarginate, lateral channel deep between the pore and along base, shallower in front and interrupted at hind angles, which are marked by a distinct tooth ; median line deep, passing through front transverse sulcus, without reaching margin, the sulcus also deep and interrupted at middle, basal foveæ represented by an oblique groove on each side of base, directed forwards and outwards to middle of disk, surface with some faint cross-striation, basal area subrugose. *Elytra* elongate-oval, not quite twice as long as wide, shoulders projecting a little forwards ; striæ deep and punctate, 1 to 5 free at base, 6 joining 7 a long way behind shoulder, striole wanting ; intervals very convex, almost costate (as in *Oxylobus*), 3 without pores, 8 almost carinate. *Sternum* practically impunctate, mesosternum not concave, metepisterna as wide as long. *Venter* punctate at sides of base. *Legs* : protibiæ without sulcus on upper surface.

Length, 12–14 mm.

ASSAM : Rotung to Kalek, 2000–3500 feet ; Rotung, 1400 feet ; near Kalek, 2500 feet (all *S. W Kemp*, Abor Expedition, Ind. Mus.).

Type in the Indian Museum, cotypes in my collection.

Subgroup VI. *CLIVINIDES.*

Something like twenty-five genera are included in this large subgroup, which has representatives all over the world, but only six of them are found within our limits. None is peculiar to India, but two, *Trilophus* and *Psilus*, are found only in South-East Asia ; two others, *Sparostes* and *Coryza*, occur both in Asia and Africa ; of the two remaining genera, *Clivina*, with its two or three hundred species, has a world-wide distribution, and *Dyschirius*, with rather under two hundred species, though found in every continent, is more prevalent in temperate than in tropical regions.

Key to the Genera.

1 (2) Antennæ with a scape, a groove beneath eye for its reception, wings of clypeus projecting forwards as oval plates. (Black, shiny insects, seldom less than 15 mm. in length.) SPAROSTES, p. 344.

2 (1) Antennæ without scape or groove, wings of clypeus not projecting far in front of median part. (Black, red, or testaceous insects, in India rarely attaining 10 mm. in length.)

3 (10) Elytra with marginal series of pores uninterrupted at middle, prothorax convex, but not usually globose.

4 (5) Surface of head with a central longitudinal carina and two oblique lateral ones, forming together an arrow-head directed forwards, clypeus quadridentate, labrum 7-setose, venter punctate and pubescent. (Black, or black and red insects, with rather deep, coarsely punctate, elytral striæ.) CORYZA, p. 346.

5 (4) Surface of head without carinæ in form of an arrow-head.

6 (9) Antennæ with joints 1 and 2 normally attached, border of elytra not dentate or crenulate.

7 (8) Prothorax bordered from apex to peduncle, labrum 6-, 7-, or 9-setose. (Black or piceous insects, rarely less than 5 mm. in length.) . . . CLIVINA, p. 351.

8 (7) Prothorax with border running back from apex, turning inwards and not reaching hind lateral pore, labrum 5-setose. (Narrow, testaceous insects, about 2·5 mm. in length.) . . TRILOPHUS, p. 381.

9 (6) Antennæ with joint 2 attached excentrically to 1, border of elytra dentate or crenulate, Indian species with labrum 5- or 7-setose. (Dark red or piceous insects, 2·3 to 4·5 mm. in length.) . . . . PSILUS, p. 386.

10 (3) Elytra with marginal series of pores widely interrupted at middle, palpi dissimilar in the two sexes, prothorax usually globose, with border extending from apex to or a little beyond hind lateral pore (rarely wanting altogether), labrum 6-setose. (Very convex black or brassy insects, averaging about 3 mm. in length.). DYSCHIRIUS, p. 390.

Genus **SPAROSTES**.

Sparostes, Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 27.

TYPE, *Sparostes brevicollis*, Putz. (China).

Form elongate. *Head* large, convex, clypeus with its wings projecting forwards on each side of median part as elongate plates, rounded at apex, frontal plates small, separated from

clypeus by a shallow emargination ; eyes moderately prominent but enchased, somewhat distant from buccal fissure, with two supraorbital setæ, genæ short and oblique ; labrum large, front margin bisinuate, 7-setose, sides densely ciliate, clypeus bisetose ; mandibles short but stout, upper surface striate, a tooth at base ; ligula moderately wide, apex sharply rounded, with two setæ placed very close together, paraglossæ membranous, narrow, free, a little longer than ligula ; mentum moderately emarginate, tooth sharply pointed, a little shorter than lobes, which are truncate at apex ; maxillæ sharp, slightly hooked, densely ciliate to apex and on outer side of apex, outer lobe jointed ; palpi rather stout, cylindrical, apical joint subacuminate, maxillaries with joints 2 and 4 about equal, 3 a little shorter, labials with 3 longer than 2, latter bisetose ; antennæ short, subgeniculate, pubescent from middle of joint 3, 4–11 moniliform, 2 half as long again as 3, 1 as long as the next three joints together, and lying in a groove between eye and buccal fissure. *Prothorax* convex, subquadrate, sides of base oblique, so that only the median part is in contact with the peduncle, sides bisetose, with a marginal groove. *Elytra* convex, border behind entire, 7-striate (excluding marginal channel), scutellary striole rudimentary, interval 3 seriate-punctate. *Sternum* very smooth, prosternal process not bordered, metasternal process bordered, metepisterna twice as long as wide, much narrowed behind. *Venter* smooth, segments 4 to 6 transversely sulcate and with a single seta on each side, apical segment with two distant setæ on each side. *Legs* adapted for digging, protibiæ 3-digitate (including apex) and with an upper tooth, joint 1 of protarsi densely ciliate, as long as the next three taken together, mesotibiæ densely fringed with hairs, a spur close to apex, metacoxæ contiguous, claws smooth.

Range: India, Burma, Siam, Indo-China, China.

The species are very easily distinguished from all others in the group by the large clypeal wings, which project forward a little in front of the labrum and far in front of the median part. Putzeys' statement that the species are apterous is quite erroneous.

189. **Sparostes striatulus**, *Putz.* [Plate IX, fig. 6.]

Sparostes striatulus, Putzeys *, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 29.

Colour black : palpi, joints 1 to 3 of antennæ, and legs very dark red.

Form elongate and parallel. *Head* just narrower than prothorax, clypeus with its front margin depressed and truncate, inner margin of wings straight, outer margin rounded, their surface a little striate, frontal plates obliquely truncate in

front and sharply rounded close to eye ; clypeal ridge slightly raised, suture wanting, frontal foveæ wide and shallow, covered by longitudinal striation ; facial carina and groove short but strongly developed, the former interrupted behind by the hind supraorbital pore, so that its extremity forms a distinct tubercle, no neck constriction ; middle of front with a longitudinal furrow, surface otherwise very smooth and shiny. *Prothorax* slightly narrower than elytra, surface almost vertical behind, where middle of base is very strongly constricted and a little produced, apex widely and deeply emarginate, front angles prominent but rounded ; sides parallel, with a moderately deep marginal channel extending between the two lateral pores, of which the front one is not far from apex, the hind one close to the angle, indicated by a small tooth, sides of base nearly straight and very finely bordered ; median line fine, front transverse sulcus only just visible close to front angles, surface smooth and shiny. *Elytra* elongate, base truncate, sides nearly parallel, not quite twice as long as wide, slightly contracted behind shoulders, which are minutely though evidently dentate ; striæ rather fine and finely punctate, 1 to 5 free at base, 6 and 7 joining at shoulder ; intervals somewhat raised on the nearly vertical base but hardly forming tubercles, 8 carinate at shoulder, but not at apex, 7 almost cariniform at both extremities, 3 with a series of half a dozen small setiferous pores adjoining stria 3.

Length, 16–22 mm. ; width, 4·5–6·5 mm.

SIKKIM : Darjiling ; Nurbong (*W. K. Webb*). BENGAL: Phulbari Tea Estate in the Duars (*E. A. Andrews*). BIHAR : Pusa ; Kierpur (*C. Paiva*) ; Chapra (*Mackenzie*). UNITED PROVINCES: Lansdowne Division (*F W Champion*); Dehra Dun. BOMBAY: Belgaum (*H. E. Andrewes*). MADRAS : Nilgiri Hills ; Manantoddy in the Wynaad, 2500 feet (*Y R. Rao*). MYSORE : Bangalore. BURMA : Rangoon ; Moulmein ; Katha (*C. R. Robbins*) ; Shan Hills (*J C. Brown*) ; Shwegyu, Okkyi (*C. F C. Beeson*) ; Tenasserim (*Helfer*). SIAM. ANNAM. TONKIN. CHINA : Hong Kong.

Type in Mr. René Oberthür's collection.

Genus **CORYZA.**

Coryza, Putzeys, Rév. Gen. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 194.

TYPE, *Clivina maculata*, Nietner. (India, Ceylon, Burma.)

Form elongate. Body winged. *Head* : clypeus somewhat concave at sides, its front margin quadridentate, the teeth rounded at apex, central pair separated by a more or less deep emargination (in the middle of which there is sometimes a very small additional tooth), lateral teeth placed a little

behind and separated from the median ones on each side by an emargination usually rather deeper than the central one, two short longitudinal ridges placed immediately behind the two central teeth, and from the level at which they terminate behind and midway between them a sharp carina running longitudinally back to the neck constriction, two other oblique carinæ starting, one on each side, from the neck constriction and meeting the central one just behind its point of origin in front; neck with a deep transverse crenulate sulcus; frontal plates rather widely bordered, subangulate at sides, convex in front, bicarinate behind; eyes moderately prominent, a little removed from buccal fissure, with two supraorbital setæ; labrum very short, truncate, 7-setose, ciliate at sides; mandibles stout, rather short and flat; ligula very small and narrow, bisetose, paraglossæ membranous, narrow, free, a little longer than ligula; mentum with two large transverse oblong pores at middle and a rounded setiferous one on each side of base, front area concave, emarginate in front, and bounded behind by a semicircular carina, a tooth in the emargination, finely carinate and not quite as long as lobes, which are sharply pointed, submentum with two large setiferous pores on each side; maxillæ narrow, moderately spinose within, slightly hooked and pointed at apex, outer lobe jointed; palpi stout, last joint inflated at base, attenuated but truncate at apex, maxillaries with joint 2 inflated, a little shorter than 4, which is twice as long as 3, labials with 2 bisetose and a little shorter than 3; antennæ short, fully pubescent from joint 4, but 2 is slightly hairy and 3 more distinctly so, joints 2 and 3 equal, each about two-thirds of 1, the rest shorter and moniliform. *Prothorax* convex, only the median part of base in contact with peduncle, sides bisetose, with a lateral groove and border, which reach base, hind angles more or less dentate; median line deep, front transverse impression not reaching margin, generally impressed more deeply at ends, hind transverse impression deep, punctate, base with a thick border. *Elytra* convex, epipleura at base with two deep, longitudinal, punctate sulci, base bordered to a point opposite stria 3, a row of tubercles across median part, three on each side, shoulders dentate, border behind entire; 8-striate, including marginal channel, with which stria 8 is apparently fused, striæ free at base, scutellary striole moderately long; interval 3 quadripunctate, the punctures practically in stria 3, interval 8 curving round behind to apex and joined in turn by all the other intervals. *Sternum*: prosternal ridge narrow, slightly sulcate, the process unbordered, metasternum longitudinally sulcate, the process bordered, metepisterna very narrow, with a longitudinal row of punctures. *Venter* punctate and setose, the process between metacoxæ bordered, last segment (♂♀) with two moderately

distant marginal setæ on each side. *Legs* sparsely setulose, adapted for digging, profemora dilated; protibiæ without sulcus on upper surface, prolonged at apex into a spiniform process, with two teeth on outer margin and an indication of a third tooth near base, mesotibiæ slender, without spur; tarsi with joint 1 as long as the rest together, protarsi with joints 2, 3, and 4 strongly transverse. Surface practically without microsculpture, but on the venter there are some faint, discontinuous, transverse lines, which hardly form a reticulation.

Range. India, Ceylon, Burma, Arabia, Erythrea.

Of the life-history nothing is known. The central carina on the head, the more or less inflated joints of the palpi, the transverse joints (2 to 4) of the protarsi, and the pubescent venter render the species easily separable from those of the genus *Clivina*, and, generally speaking, it may be said that the characters which differentiate this genus from the other genera of the Clivinides are clear and satisfactory. Individual specimens, however, of which I have seen a considerable number from different parts of India, Ceylon, and Burma, exhibit great variability not only in size and colour, but in some other characters, and particularly in the form of the quadridentate clypeus.

Five species have hitherto been described, of which *C. maculata*, Nietn., was the earliest. Putzeys, when describing the genus, devotes only two or three lines to each of the two new species he proposed, and mentions no characters of importance to differentiate them from Nietner's, while Bates failed to identify the genus. Being unable to separate these four species, I have felt compelled to unite them in one, but the remaining species, *C. semirubra*, which inhabits a limited and chiefly mountainous area in the United Provinces, presents not only a very distinct colour scheme, but, as will be seen further on, some other characters which seem to justify its separate treatment.

Key to the Species.

1 (2) Colour bronze-black, elytra sometimes red at extremity or vaguely brown, head without transverse ridge in front of neck constriction, elytra with basal tubercles well developed, humeral tooth rather slight . . . . . *maculata*, Nietn., [p. 349.

2 (1) Colour black, basal half of elytra red, head with a transverse ridge in front of neck constriction, elytra with basal tubercles slight, humeral tooth well developed . . . . . *semirubra*, Andr., [p. 350.

190. **Coryza maculata**, *Nietn.*

Clivina maculata, Nietner *, Journ. As. Soc. Beng. xxv, 1856, p. 391; id., Ann. Mag. Nat. Hist. (2) xix, 1857, p. 246; Putzeys, Postscr. ad Cliv. Mon., Mém. Liége, xviii, 1863, p. 51.

Coryza maculata, Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 196; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, pp. 380 and 381; id., Ann. Mag. Nat. Hist. (9) xix, 1927, p. 105; id., Ann. Mag. Nat. Hist. (9) xx, 1927, p. 265.

Coryza nietneri, Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 196.

Coryza cariniceps, Putzeys *, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 196.

Clivina chlorizans, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 282.

Coryza chlorizans, Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470.

Colour black, often with a greenish or bluish tinge, elytra sometimes more or less dark brown; palpi, joints 1 and 2 of antennæ, and legs (excluding profemora) ferruginous; profemora and rest of antennæ piceous.

Head: clypeus with its front margin conspicuously quadridentate, the central emargination nearly as deep as the lateral ones, both the median and oblique carinæ very distinct, neck constriction coarsely punctate, surface generally very uneven. *Prothorax* about a third wider than head, hardly wider than long, a slight but generally distinct tooth at hind angles; median line very deep, passing through the front transverse impression, sometimes without quite joining it, but not reaching front margin, the impression fairly deep and crenulate. *Elytra* elongate-oval, a third wider than prothorax and quite a half longer than wide, widest just behind middle, shoulders clearly dentate; punctate-striate, the striæ fairly deep, the punctures deep in front, gradually disappearing towards apex, 1 rather deeper than the rest; intervals moderately convex, 1 slightly raised. *Legs*: protibiæ with the spines well developed, apical digitation curved, moderately sharp, a little thicker than lower spine and longer than spur.

Length, 3·45–4·80 mm.

ASSAM: Naga Hills, 4000 feet (*S. N. Chatterjee*—For. Res. Inst.). BENGAL: Eastern Duars (*H. Stevens*). BIHAR: Pusa (Pusa coll.). UNITED PROVINCES: Garhwal, Boxar (Ind. Mus.); Dehra Dun (*M. Cameron*—For. Res. Inst.); West Almora and Haldwani (*H. G. Champion*). CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*). BOMBAY: Kanara (*T. R. D. Bell*). MADRAS: Madras (*F. H. Gravely*—Madras Mus.); Malabar; Nilgiri Hills, Teppukadu, 3000 feet (*H. L. Andrewes*). CEYLON: Murunkan (*G. M. Henry*—Colombo Mus.) and "Ceylon" (*J. Nietner* (type)). BURMA: Teinzo (*L. Fea*—Genoa Mus.); Shwebo, Kyauktan (*H. G. Champion*).

Type in the Stettin Museum; type of *nietneri* lost; type of *cariniceps* in Mr. René Oberthür's collection; type of *chlorizans* in the Genoa Civic Museum.

As in the species of *Clivina*, so in this species, the colour, size, and to some extent the form are very variable. In the type of *maculata* the elytra are dark brown, with a vague black spot on the disk. The type of *nietneri* is lost, but Putzeys informs us that his specimen had bronze-black elytra with the apical fourth dark red. In *cariniceps* the colour is black, the form narrow, and the elytral striæ less deep than usual. In *chlorizans* the elytra have a bluish tinge. All these variations seem to be individual, and the names seem hardly worth retaining even to indicate varieties.

191. **Coryza semirubra**, *Andr.*

Coryza semirubra, Andrewes, Ent. Month. Mag. 1926, p. 71; id., Ann. Mag. Nat. Hist. (9) xx, 1927, p. 265.

Colour black, the basal half of elytra red; underside, pro-femora, and apical joints of antennæ more or less piceous;

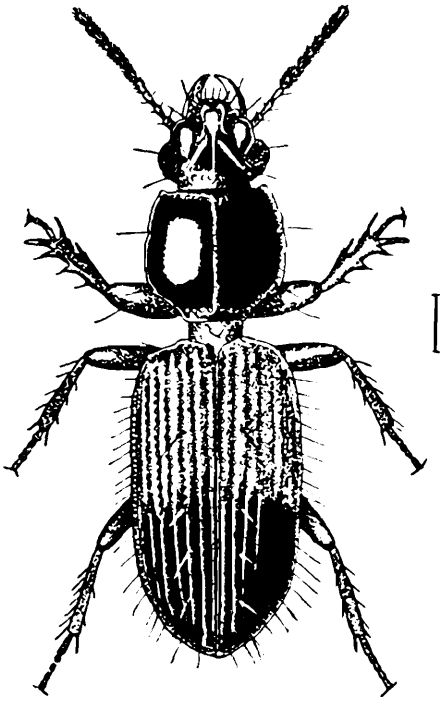


Fig. 50.—*Coryza semirubra*, Andr.

mandibles, legs, and sometimes venter ferruginous; palpi, basal joints of antennæ, and tarsi more or less flavous.

Head: clypeus with front margin quadridentate, but with the central emargination shallower, sometimes much shallower, than the lateral ones, the median carina extending forwards and dilated at extremity, but not reaching front margin, becoming finer behind, though reaching neck constriction, the oblique lateral carinæ much slighter than the central one, sometimes indistinct, the space enclosed between them somewhat flattened

bounded behind by a slight ridge in front of the neck constriction, and sometimes nearly smooth. *Prothorax* a half wider than head, but very little wider than long, front angles a little advanced, sides slightly indented by the pores of the front lateral setæ, the tooth at hind angle well developed; median line deep, passing through the front transverse impression, but not, or only indistinctly, joining it, the impression coarsely punctate. *Elytra* not quite a half wider than prothorax and about as much longer than wide, shoulders distinctly dentate, basal tubercles very small and inconspicuous; striæ punctate and fairly deep, 1 a little deeper than the rest, interval 1 slightly raised. *Legs*: protibiæ with strongly developed spines, the minute spine near base generally visible, apical digitation a little longer and blunter than in *maculata*.

Length, 3·75–4·50 mm.

UNITED PROVINCES: Almora, Sarju Valley (5000 feet), Upper Gumti Valley, Ranikhet and Swal River basin (all *H. G. Champion*), Dwarahat, 5000 feet, and Kanarichina, 4000 feet (*R. N. Parker*—For. Res. Inst.); Tanakpur and Haldwani, along Nandhaur River (*H. G. Champion*); Chakrata, Saiya, 3600 feet (*M. Cameron*), and Binal Gad, 3500 feet (*S. N. Chatterjee*); Kali Gad near Dehra Dun, Kolhu Khet Gad at Mussoorie, and on the Aglar River, Tehri Garhwal (*M. Cameron*). PUNJAB: Seraj, Ani, 4500 feet (*H. G. Champion*).

Type in the British Museum.

Genus **CLIVINA**.

Clivina, Latreille, Hist. Nat. Crust. et Ins. iii, 1802, p. 96; Dejean, Spec. Gen. i, 1825, p. 411; Putzeys, Mon. des *Clivina* et genres voisins, Mém. Liége, ii, 1846, p. 577; Lacordaire, Gen. Col. i, 1854, p. 204; Putzeys, Postscr. ad Cliv. Mon., Mém. Liége, xviii, 1863, p. 29; id., Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 107; Fleischer. Best. Tab. Eur. Col. xxxix, Scaritini, 1899, p. 33; Andrewes in Mission Babault Ind. Carab. 1924, p. 11; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 372.

Eupalamus, Schmidt-Goebel, Faun. Col. Birm. 1846 (cover); Motchulsky, Bull. Mosc. 1861, i, p. 101.

Dacca, Putzeys, Postscr. ad Cliv. Mon., Mém. Liége, xviii, 1863, p. 68; Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470.

TYPE, *Tenebrio fossor*, L. (Palæarctic and Nearctic regions.)

Form elongate and parallel. *Head* not much narrower than prothorax, with a deep longitudinal furrow on each side, the anterior parts forming the frontal impressions; vertex with a "facial carina" on each side, with an internal groove called the "facial sulcus," neck usually with a punctate constriction; eyes normally prominent, somewhat removed from buccal fissure, with two supraorbital setæ; labrum truncate, or with

median part slightly produced, 6-setose, 7-setose, or 9-setose (in Indian species), sides conspicuously ciliate; clypeus very variable in form, bisetose, and divisible into three separate areas, (1) a transverse "clypeal ridge" (sometimes obsolete), (2) a "median part" in front of the clypeal ridge, (3) a lateral part or "wing" on each side; sides of head in front forming rounded "frontal plates," beneath which the antennæ are inserted; mandibles generally short and wide, sometimes long and slender, toothed at base only; ligula slender, bisetose, separated from and about as long as the slender membranous paraglossæ; mentum moderately emarginate, with a tooth in the sinus, sometimes carinate along median line, apex of tooth occasionally dilated and more or less triangular; maxillæ sharp, hooked at apex, outer lobe jointed; palpi subacuminate, rather long and slender, similar in the two sexes, maxillaries with joint 2 somewhat inflated, 4 twice as long as 3, labials with joints 2 and 3 about equal, 2 bisetose; antennæ pubescent from joint 3, and moniliform towards apex, rarely filiform. *Prothorax* convex, more or less quadrate, sides of base oblique, only the median part in contact with the peduncle, sides bordered, with a fairly deep groove extending at least between the two lateral setæ, which are placed at about a third from apex, and just within the hind angles; median line and front transverse sulcus nearly always clearly marked, the hind transverse impression obsolete. *Elytra* convex, the sides usually parallel, basal half of epipleura more or less sulcate, border behind entire, seven punctate striæ (excluding marginal channel) and a scutellary striole of varying length, 1 sometimes joining 2 at base, 3 free, 4 sometimes free, sometimes joining 5, 5 to 7 usually joining at shoulder, base more or less tuberculate (Indian species), interval 3 quadripunctate or impunctate. *Sternum*: prosternum separated from prosternal process by a ridge, which is narrow, though varying in width and generally sulcate, proepisterna usually rugulose or striate, metasternal process bordered between mesocoxæ, metepisterna elongate. *Venter* with the segments transversely sulcate, a seta on each side of middle line, apical segment with two marginal setæ on each side, which may be either close together or wide apart, surface often punctate (Indian species). *Legs* stout and adapted for digging, profemora beneath sometimes dilated and sulcate, protibiæ wide, digitate, with three long digitations on outer margin (including apical one) and a small tooth nearer base, mesotibiæ often with a spur above apex, metacoxæ contiguous, claws smooth.

Range. World-wide.

Of the life-history nothing seems to be known. The species live in moist places, and have been taken in India at the roots of trees, under bark, under dung, under piles of dead vegetation,

in marshes, under stones near water, and "in the gallery of a mole-cricket"; they also come commonly to light in the evening.

It is important to note that in this genus there is great variability of individuals in size, in colour, and in form. H. W. Bates says: "The singular sculpture of the head in *Clivina*, though constant in ground plan, is subject to considerable individual variation in the species, as may be seen by comparing, for example, a good series of the common *C. indica* from various localities. This applies equally to the prothorax, the elytra being more constant. Microsculpture is generally absent, but, when present, does not appear in this genus to be of specific importance."

Putzeys' Monograph having been published as a separate work, and repaged, I have given the pagination of the separate in a parenthesis.

Key to the Species.

1	(10)	Mesotibiæ without spur above apex.	
2	(7)	Front margin of clypeus more or less dentate, front of head with a carina or sulcus in the form of an inverted V, clypeus and wings fused, labrum 6-setose, ventral pores distant.	
3	(6)	Front of clypeus trisinuate, the ends advanced as a blunt tooth, the inverted V on front formed by a sulcus.	
4	(5)	Ventral surface nearly smooth, length about 8 mm.	*attenuata*, Herbst, [p. 355.
5	(4)	Ventral surface clearly punctate, length about 6·5 mm.	*striata*, Putz., p. 357.
6	(3)	Front of clypeus more or less 6-dentate, the two middle teeth rounded, the inverted V on front formed by a carina	*sagittaria*, Bates, [p. 358.
7	(2)	Front margin of clypeus truncate or emarginate, front of head somewhat raised, the deep transverse suture behind it, clypeus and wings separated by a distinct notch, labrum 7-setose, ventral pores close together.	
8	(9)	Facial carina and sulcus prolonged very nearly to clypeal suture ..	*tranquebarica*, Bon., [p. 359.
9	(8)	Facial carina and sulcus hardly extending forward beyond mid-eye level	*semicarinata*, Putz., [p. 361.
10	(1)	Mesotibiæ with a spur above apex.	
11	(16)	Interval 3 without pores, front transverse sulcus of prothorax not reaching margin, labrum 6-setose.	

12 (15) Intervals moderately convex, sides of occiput punctate.
13 (14) Mentum with a rounded tooth, neck constriction interrupted at middle . *memnonia*, Dej., p. 362.
14 (13) Mentum with the tooth dilated and concave at apex, neck constriction more or less continuous ... *assamensis*, Putz., [p. 364.
15 (12) Intervals costate, occiput with a transverse series of longitudinal sulci. *costata*, sp. nov., p. 364.
16 (11) Interval 3 with three or four pores, labrum 7- or 9-setose.
17 (28) Clypeal suture not distinctly impressed, ventral pores distant.
18 (27) Prothorax with a transverse sulcus in front, a more or less developed punctate figure Y (sometimes obsolete) on each side.
19 (24) Prothoracic transverse sulcus reaching margin at extremities.
20 (23) Clypeus with its median part and wings almost fused, front more or less punctate or rugose, mesotibial spur small and near apex.
21 (22) Eyes prominent, middle of front subrugose and minutely punctate, elytral intervals moderately convex . ... *westwoodi*, Putz., [p. 365.
22 (21) Eyes deeply embedded, though visible from above, middle of front depressed and punctate, elytral intervals costate .. .. *costulipennis*, Bates, [p. 366.
23 (20) Clypeus with median part and wings separated by a distinct notch, front smooth, mesotibial spurs fairly long at apical third .. *helferi*, Putz., p. 367.
24 (19) Prothoracic transverse sulcus not reaching margin.
25 (26) Vertex with a large flattened or depressed area, prothorax and protibial digitations normal . ... *gamma*, sp. nov., p. 368.
26 (25) Vertex convex, prothorax cleft behind, protibial digitations spatulate. .. *spatulifera*, sp. nov., [p. 369.
27 (18) Prothorax without transverse sulcus in front, its surface smooth. .. *bengalensis*, Putz., [p. 370.
28 (17) Clypeal suture distinctly impressed.
29 (32) Ventral pores distant.
30 (31) Head flattened behind into a pentagonal figure, prothorax quadrate, about as long as wide ... . *pileolata*, Bates, p. 372.
31 (30) Head convex behind, with a short longitudinal sulcus on vertex, prothorax evidently longer than wide, body very long, narrow, and cylindrical. *extensicollis*, Putz., [p. 372.
32 (29) Ventral pores close together.

33 (34) Prothorax very convex, half as wide again as head, strongly contracted in front, interval 3 with front pore close to base, adjoining stria 2 — *castanea*, Westw., [p. 374.

34 (33) Prothorax moderately convex, not more than a third wider than head, parallel-sided or gently contracted in front, interval 3 with all pores adjoining stria 3.

35 (44) Labrum 7-setose, mandibles stout and never very long.

36 (39) Vertex and front smooth or vaguely rugose, neck constriction rather slight and widely interrupted at middle.

37 (38) Clypeus rather deeply emarginate, interval 3 with pores of moderate size adjoining stria 3, colour mainly piceous, average length 5–6 mm. . — *lobata*, Bou., p. 375.

38 (37) Clypeus slightly emarginate, interval 3 with very large pores, occupying nearly the whole interval, colour dark red with piceous elytra, length about 4 mm. ... . .. — *mustela*, Andr., p. 377.

39 (36) Vertex and front rugosely sculptured, neck constriction deep.

40 (43) Clypeus slightly emarginate, neck constriction uninterrupted, length 6–7 mm.

41 (42) Front punctate and rugose both at sides and transversely between suture and vertex, prothorax somewhat contracted in front, the front angles slightly projecting .. — *brevior*, Putz., p. 378.

42 (41) Front and vertex punctate and rugose at sides only, prothorax with parallel sides, front angles rounded . — *elongatula*, Nietn., [p. 378.

43 (40) Clypeus deeply and angularly emarginate, neck constriction interrupted at middle, length 7–9 mm. .. — *sectifrons*, Bates, p. 379.

44 (35) Labrum 9-setose, mandibles very long, sharp, and slender at apex — *forcipata*, Putz., p. 380.

192. Clivina attenuata, *Herbst.*

Scarites attenuatus, Herbst *, Nat. Syst. Ins. Käf. x, 1806, p. 264, t. 176. f. 7; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 98.

Clivina picipes, Bonelli *, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 481; Dejean, Spec. Gen. i, 1825, p. 416; Putz., Mon. p. 623 (105); id., Postscr. p. 51; Andrewes, Ann. Mus. Civ. Gen. xlix, 1922, p. 393.

Clivina melanaria, Putzeys *, Mon. p. 586 (68); Andrewes, Trans. Ent. Soc. Lond. 1919, p. 206.

Clivina attenuata, Putzeys, Mon. p. 626 (108); id., Rév. Gén. p. 110; id., Ann. Soc. Ent. Belg. 1868, t. 1. f. 2; Bates, Ann. Soc. Ent. Fr. 1889, p. 262; id., Compt. rend. Soc. Ent. Belg. 1891, p. 325; Andrewes, Rec. Ind. Mus. xxii, 1921, p. 340; id. in Mission Babault Ind. Carab. 1924, p. 11; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 374.

Clivina attenuata, var. *bhamoensis*, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 275.

Colour black, shiny, palpi and antennæ dark testaceous, tibiæ and tarsi very dark red.

Head about as long as wide, with the eyes very prominent behind, where their margin is at right angles to neck; clypeus with the wings and median part fused, the margin trisinuate,

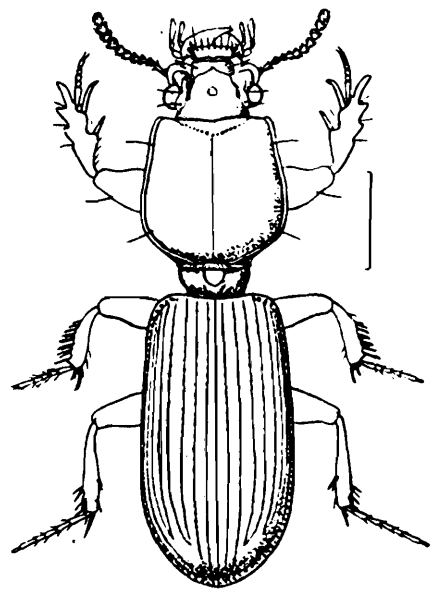


Fig. 51.—*Clivina attenuata*, Herbst.

finely bordered, the wings slightly advanced in the form of a blunt tooth, their sides oblique; frontal plates large, bordered, separated from clypeus by a deep depression, convex, outwardly explanate, embracing the eye in front and nearly reaching its outer margin, a slight sulcus behind, close to inner margin of eye; clypeal ridge represented by a fine, clearly cut sulcus formed by two nearly straight lines, which run obliquely forward from the deep frontal impressions and meet at an angle at middle; vertex with a large semicircular pore (convex forwards), facial sulci slight and short; surface smooth, with some fine punctures behind eyes; labrum bisinuate, sexsetose; mandibles wide, moderately sharp; mentum carinate in middle, the tooth wide, rounded, and concave beneath; antennæ strongly moniliform, joint 2 longer than 3. *Prothorax* very convex, a little longer than wide, sides nearly straight, converging in front, rounded behind, without tooth, front angles slightly advanced; median line rather fine,

joining front transverse sulcus, which is deep and punctate, and only reaches margin by a very fine extension; surface smooth, microscopically punctulate, with one or more faint transverse striæ rather before base. *Elytra* convex, not quite twice as long as wide, slightly dilated behind and widest just behind middle, apex rounded, border carinate at shoulder, striæ deep and very clearly punctate, 1 to 3 free at base, 4 to 7 all converging on base of 4, striole vestigial; intervals convex, 3 without pores, outer a little narrower than inner ones, 8 very narrow but hardly carinate. *Sternum*: prosternal ridge very narrow, finely bordered in front, not sulcate, proepisterna transversely wrinkled. *Venter* finely and sparsely punctate, the two pores on last segment moderately distant. *Legs* with profemora not dilated or sulcate beneath, protibiæ not sulcate, tridenticulate, the teeth short, mesotibiæ finely crenulate, spinulose, but without spur.

Length, 6·5–9 mm.

INDIA: common throughout the Northern Provinces and as far south as Nagpur. BURMA: Tenasserim. MALAY PENINSULA. INDO-CHINA. PERSIA:. Bushire. The average length of Indian specimens is about 8 mm., of those from Indo-China about 6·5 mm.

Type in the Berlin Zoological Museum; of *picipes* in the Turin Museum; of *melanaria* in the Oxford University Museum (Hope Dept.). Putzeys writes in his 'Postscriptum' (p. 51): "Mr. Schaum has examined the insect on which Bonelli made his description, and which is in the Berlin Museum. He recognized it as being the *Scar. attenuatus* of Herbst." As Bonelli's type is actually at Turin, there seems to be some misunderstanding here.

C. sulcigera, Putz. (Rév. Gén. p. 110), from Siam, of which I have seen the type, appears to be only a local form. Other specimens which I have seen, including those from Saïgon determined by Bates (Ann. Soc. Ent. Fr. 1889, p. 262), also agree fairly well with the typical form, though the pore on the vertex is often divided into two.

Bates's var. *bhamoensis*, from Bhamo, differs from the type-form in having the elytral striæ lightly punctate and the front transverse sulcus of the prothorax only vaguely crenulate.

193. **Clivina striata**, *Putz.*

Clivina striata, Putzeys *, Mon. p. 592 (74); id., Rév. Gén. p. 110; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 206; id. in Mission Babault Ind. Carab. 1924, p. 115; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, pp. 374 and 375.

The species is very nearly allied to *attenuata*, much smaller than Indian examples of that species, but similarly coloured. It differs in the particulars given below. *Head* with the frontal

plates a little narrower and more sharply rounded, clypeal sulcus formed by curved lines, the angle at which they meet somewhat rounded, the pore on vertex less impressed. *Prothorax* a little longer and narrower, middle of base somewhat narrower and produced slightly backwards, so that it is more evident. *Elytra* quite twice as long as wide, the sides parallel, the shoulders squarer. *Venter* with its sides more clearly punctate, the apical segment being covered with a fairly close puncturation.

Length, 6–7 mm.

INDIA. CEYLON. Fairly common in the southern provinces of India and as far north as Nagpur, where it touches the area occupied by *attenuata*. I have, however, seen one or two examples from the United Provinces, Bihar and Chota Nagpur.

Type in the Oxford University Museum (Hope Dept.).

The characters mentioned above are subject to some degree of variation, and, were it not for the rather marked difference in the puncturation of the venter, the species could hardly be regarded as more than a diminutive form of *attenuata*.

194. **Clivina sagittaria**, *Bates*.

Clivina sagittaria, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 275.

Colour piceous : palpi, base of antennæ, and two hind pairs of legs dark red.

Head rather narrow, eyes small, deeply enchased, median part of clypeus tri-emarginate, a short projecting tooth at each end, an emargination separating the wings, which are outwardly similarly dentiform and placed a little further back ; frontal plates inwardly convex, outwardly explanate, narrow, rounded sharply in front, gently behind, separated from wings by a slight notch ; clypeal ridge formed by two narrow, somewhat irregular carinæ, converging in front, the point of junction rounded, behind this two similar carinæ converging in front in the same way, but at a more acute angle, extending over the vertex behind, and there converging again ; clypeal suture wanting, frontal impressions deep and wide in front, indistinct behind, where the sides of the head are coarsely and irregularly rugose-punctate, though the facial carina and a sulcus within it can be traced, one or more slight longitudinal furrows on vertex, neck constriction widely interrupted at middle, surface generally uneven ; labrum 6-setose, mandibles short but very sharp ; mentum with a shallow sinus, carinate in middle, the tooth short and somewhat hollowed out ; antennæ short, moniliform, joint 2 much longer than 3, 4 very small and globular, apical joints transverse. *Prothorax* convex, rather longer than wide, front angles projecting slightly, sides nearly parallel, though contracting faintly in front, rounded behind,

a slight notch at the point where they join the sides of base, but no tooth, the pore not far distant; median line fine, subcrenulate, front transverse sulcus reaching margin, surface sparsely punctate over greater part of disk. *Elytra* moderately convex, twice as long as wide, sides faintly rounded; striæ fairly deep and clearly punctate, 1 turning outwards at base but hardly joining 2, 3 free, 4 joining 5, no striole; intervals convex, 3 without pores, 8 carinate at apex but disappearing before reaching shoulder. *Sternum*: prosternal ridge finely carinate, the carina forking and forming a sulcus in front, the process slightly bordered at sides, a raised transverse ridge in front of the declivity; some coarse puncturation at sides. *Venter* punctate at sides, the pores on apical segment widely distant. *Legs*: profemora not dilated beneath, protibiæ not sulcate, 4-denticulate, mesotibiæ narrow, serrate, spinulose, without spur.

Length, 4–5 mm.

BURMA: Rangoon (*L. Fea*). BIHAR: Pusa (*U. Bahadur*). FEDERATED MALAY STATES: Selangor (*H. M. Pendlebury*). STRAITS SETTLEMENTS: Singapore (*C. J. Saunders*).

Type (Rangoon) in the Genoa Civic Museum.

In addition to the specimen mentioned above, there are in the Pusa collection two much larger examples (6·5 mm.), which are not in good condition, but which, I think, belong to this species. In these the head is more distinctly rugose and the longitudinal furrows on the vertex are more developed.

195. **Clivina tranquebarica**, *Bon.*

Clivina tranquebarica, Bonelli *, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 484; Andrewes, Ann. Mus. Civ. Gen. xlix, 1922, p. 394; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 377.

Eupalamus? fulvaster, Motchulsky *, Bull. Mosc. 1861, i, p. 101; Andrewes, Trans. Ent. Soc. Lond. 1928, p. 7.

Eupalamus? brunnescens, Motchulsky *, Bull. Mosc. 1861, i, p. 101; Andrewes, Trans. Ent. Soc. Lond. 1928, p. 7.

Eupalamus? rufipes, Motchulsky *, Bull. Mosc. 1861, i, p. 102; Andrewes, Trans. Ent. Soc. Lond. 1928, p. 7.

Eupalamus? cordicollis, Motchulsky *, Bull. Mosc. 1861, i, p. 102; Andrewes, Trans. Ent. Soc. Lond. 1928, p. 7.

Clivina convexicollis, Putzeys *, Postscr. p. 52; id., Rév. Gén. p. 133; Bates, Ann. Soc. Ent. Fr. 1889, p. 262; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 279.

Clivina foveicollis, Putzeys *, Postscr. p. 61; id., Rév. Gén. p. 133.

Clivina obesicollis, Putzeys *, Postscr. p. 66; id., Rév. Gén. p. 132; id., Ann. Soc. Ent. Belg. 1868, t. 1. f. 10.

Clivina mordax, Putzeys *, Postscr. p. 67; id., Rév. Gén. p. 133; Bates, Ann. Soc. Ent. Fr. 1889, p. 263; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 280; Andrewes, Rec. Ind. Mus, xxii, 1921, p. 340; id. in Mission Babault Ind. Carab. 1924, p. 12.

Clivina marginicollis, Putzeys *, Rév. Gén. p. 133.

Clivina placida, Putzeys *, Rév. Gén. p. 134.
Clivina rufipes, Putzeys, Rév. Gén. p. 134; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72.
Clivina stigmatica, Putzeys *, Rév. Gén. p. 134.
Clivina scuticeps, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 280.

Colour black, shiny: palpi, joints 1 to 3 of antennæ, meso- and metatibiæ, and all tarsi testaceous red.

Head fairly wide, eyes prominent; median part of clypeus truncate, bordered, the angles a little rounded, wings about on the same level, and separated by a slight notch, rounded in front, and generally somewhat concave; frontal plates convex, bordered, subangulate externally; surface of clypeus slightly raised but not forming a ridge, suture and lateral impressions both deep, the latter joining the former and extending from behind eye to front margin, isolating a kind of inverted

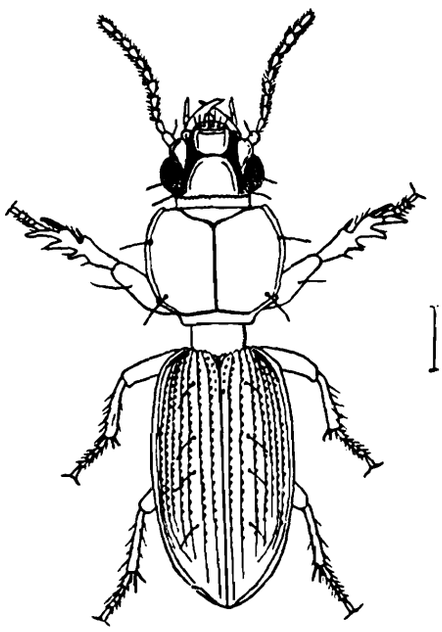


Fig. 52.— *Clivina tranquebarica*, Bon.

shield on front and vertex; facial carina reaching constriction behind and with an inner sulcus, neither quite reaching clypeal suture; a small pore generally present on vertex, neck constricted behind eyes, with closely placed elongate punctures, surface microscopically punctulate; labrum 7-setose, a little produced and obtusely angulate at middle; mandibles hooked and rather sharp; mentum wide, concave, carinate in middle, tooth rather wide, dilated and obtusely pointed at apex, as long as lobes; antennæ moniliform, joints 2 and 3 subequal. *Prothorax* strongly convex, rather wider than long and widest at about middle, sides more or less rounded, sometimes very strongly, front angles generally—though not always—obliterated, hind angles marked by a small tooth; median line and

front transverse sulcus clear but not deep, ends of latter reaching margin; surface more or less wrinkled, sometimes with small patches of punctures, a microsculpture of isodiametric meshes sometimes covering the whole upper side, sometimes confined to margins. *Elytra* convex, not quite twice as long as wide, with faintly rounded sides; the striæ fairly deep and finely punctate, 1 to 3 free at base, 4 joining 5, 6 and 7 ending a little further back, but 4 to 7 all converging on base of 5, striole fairly long; intervals convex, 3 with four clearly marked pores on middle of interval, 8 carinate at both ends, rounding shoulder in front and ending opposite 5. *Sternum* smooth, prosternal ridge moderately narrow and slightly sulcate. *Venter* smooth, the two pores on last segment close together. *Legs*: protibiæ without sulcus, tridenticulate, the teeth moderately long, mesotibiæ narrow, with few bristles, arising from small tubercles, and no spur.

Length, 4·25–7 mm.

INDIA. CEYLON. BURMA. INDO-CHINA. MALAY STATES and ARCHIPELAGO.

Type in the Turin Museum; those of *fulvaster*, *brunnescens*, *rufipes*, and *cordicollis* in the Moscow University Museum; those of *convexicollis*, *foveicollis*, *mordax*, *obesicollis*, and *stigmatica* in the Brussels Museum; those of *marginicollis* and *placida* in Mr. René Oberthür's collection; that of *scuticeps* in the Genoa Civic Museum.

This wide-ranging species is one of the most variable in the genus. It does not appear to extend to Australia, and in Japan is replaced by *C. niponensis*, Bates. The two specimens referred to by me as "*Clivina sp.*" in Rec. Ind. Mus. xxii., 1921, p. 341, belong to this species. Apart from size and colour, the principal variations are in the form of the prothorax, which varies much in width, the degree to which the sides are rounded, the extent to which the front angles are obliterated, and the puncturation and microsculpture of the surface.

196. Clivina semicarinata, *Putz.*

Clivina semicarinata, Putzeys *, Compt. rend. Soc. Ent. Belg. 1877, p. 44; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 377.
Clivina occipitalis, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 281.

This species is closely allied to *tranquebarica*, but differs in the following characters. Head with the median part of clypeus distinctly emarginate, bordered and somewhat concave in front; wings angulate and placed further back, their inner half quite merged in the lateral impressions, outer half concave and usually separated from the inner half by a slight ridge; clypeal ridge strongly raised, curved (convex forwards), suture deep and wide, behind it a second slighter transverse

groove (occasionally obsolete), not quite reaching lateral impressions; facial carina and sulcus short, hardly extending forward beyond mid-eye level, the carina strongly developed and subinterrupted at middle, a very deep pore on vertex, which in the type becomes an elongate furrow, surface generally uneven. Prothorax rather more contracted in front, the sides less rounded, the median line rather deeper. Elytra with rather deeper striæ, especially in front, and the intervals therefore more convex.

Length, 6–6·5 mm.

BENGAL: Calcutta. BIHAR: Pusa (*M. Cameron*). KUMAON: Haldwani, Tanakpur, on bank of River Sarda (*H. G. Champion*). ASSAM: Garo Hills, banks of R. Someswari (*S. W Kemp* and *B. Chopra*); Bhutan frontier, Mangaldai, Deshnoi River (*S. W Kemp*). CENTRAL PROVINCES: Hoshangabad, on bank of River Nerbudda (*E. A. d'Abreu*). BURMA: Bhamo and Senmigion (*L. Fea*); Upper Chindwin (*C. R. Robbins*); Toungoo (*B. M. Bhatia*).

Type in the Stettin Museum; that of *occipitalis* in the Genoa Civic Museum.

Two examples of this species were sent to Putzeys by Dr. Dohrn, and I have seen both of them. The type is labelled "Birma (Helfer)", but Putzeys' example bears the label "Calcutta," so that the locality from which they came is open to doubt.

197 **Clivina memnonia**, *Dej.*

Clivina memnonia, Dejean *, Spec. Gen. v, 1831, p. 503; Putzeys, Mon. p. 588 (70); id., Rév. Gén. p. 108; Bouchard, Ann. Soc. Ent. Fr. 1903, p. 169; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 373.

Clivina indica, Putzeys *, Mon. p. 585 (67); id., Postscr. p. 35; id., Rév. Gén. p. 108; id., Compt. rend. Soc. Ent. Belg. 1875, p. 69; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72; id., Ann. Soc. Ent. Fr. 1889, p. 262; id., Compt. rend. Soc. Ent. Belg. 1891, p. 325; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 274; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 206; id. in Mission Babault Ind. Carab. 1924, p. 115.

Clivina rugosifrons, Nietner *, Journ. As. Soc. Beng. xxv, 1856, p. 390; id., Ann. Mag. Nat. Hist. (2) xix, 1857, p. 245; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 105.

Clivina recta, Walker *, Ann. Mag. Nat. Hist. (3) ii, 1858, p. 203; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 187.

Colour black: palpi, antennæ at base, middle and hind legs dark red, the elytra and the whole of the antennæ often reddish.

Head wide, eyes prominent; clypeus with its wings and median part fused, the front edge continuous and slightly emarginate, the point of junction marked sometimes by a slight prominence, and behind by a faint ridge, the angles not much

rounded; frontal plates separated from clypeus by a notch, concave in front, convex behind; clypeal ridge strongly marked, curved (convex forwards), suture obsolete; frontal impressions wide and irregular, facial carinæ rather indistinct in front, broken up, but sometimes nearly meeting ends of clypeal ridge; surface very uneven, indistinctly punctulate, but with some larger punctures on each side behind and on under surface, a large elongate pore (sometimes forming a sulcus) on middle of vertex; labrum sexsetose, mandibles short and stout, mentum with a shallow sinus and a rounded tooth, shorter than lobes, antennæ moniliform, joint 2 much longer than 3. *Prothorax* convex, subquadrate, rather transverse, slightly narrowed in front, with the angles a little advanced; median line passing through front sulcus, which is

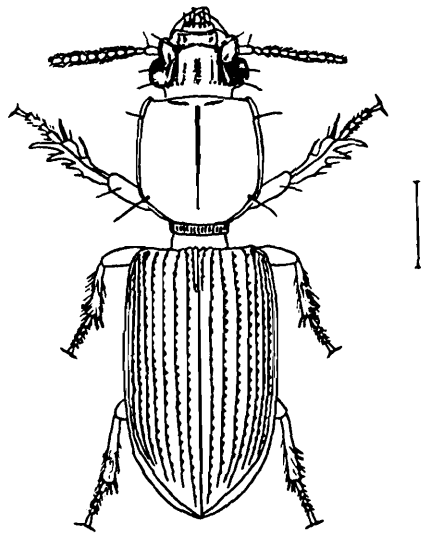


Fig. 53.—*Clivina memnonia*, Dej.

slightly interrupted and does not reach margin at extremities; hind angles without tooth, surface vaguely and irregularly striate. *Elytra* convex, parallel, rather pointed at apex, not quite twice as long as wide; striæ deep, crenulate, 3 and 4 free at base, 1 joining 2, 5 joining 6, striole fairly long; intervals convex, 3 without punctures, 7 and 8 narrower than the rest, joining just behind shoulder, 8 forming a slight narrow carina, both behind shoulder and near apex. *Sternum*: prosternal ridge narrow and sulcate. *Venter* punctate, last segment with the two pores widely distant. *Legs* with the protibiæ finely sulcate, 4-denticulate, mesotibiæ rather densely fringed with bristles, a short spine just before apex.

Length, 6·5–11 mm.

INDIA. CEYLON. BURMA. MALAY PENINSULA. INDO-CHINA.

One of the commonest and, in point of size, one of the most variable eastern species. The average length of Indian specimens is about 8 mm., of those from Indo-China about 6·5 mm.

Type in Mr. René Oberthür's collection; that of *indica* in the Oxford University Museum (Hope Dept.); that of *rugosifrons* in the Berlin Zoological Museum; that of *recta* in the British Museum.

198. **Clivina assamensis**, *Putz.*

Clivina assamensis, Putzeys*, Mon. p. 584 (66); id., Postscr. p. 35; id., Rév. Gén. p. 108; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 205; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 373.

This species on its upper surface differs very little from *memnonia*. The head is relatively smoother, and the row of punctures across the neck, which in *memnonia* is generally widely interrupted, is here more or less continuous. The prothorax hardly differs, but the elytral striæ are not so deep, and the intervals are consequently flatter.

I am obliged to treat the species as distinct on account of the remarkable character of the mentum. The tooth in the sinus, which in *memnonia* is blunt and nearly flat, is dilated in this species into a kind of shallow cup (concave forwards), the upper margin of which projects beyond the lower, the latter at its lowest point forming a small rounded knob.

Length, 9 mm.

ASSAM. BENGAL: Sarda and Sunderbans (*F W Champion*). BIHAR: Pusa (*G. P. Pillai*) and Chapra. ORISSA: Bhubaneswar, Puri district (*F H. Gravely*—Ind. Mus.). MADRAS: Rambha, Ganjam district (*N Annandale*—Ind. Mus.).

Type in the Oxford University Museum (Hope Dept.).

In the type, which came from Assam, there are some slight transverse furrows on the head, hardly visible in the other specimens. This species does not replace *memnonia* in the regions it inhabits, but occurs along with it. I have seen very few examples, all from the north-eastern corner of India, though extending for some distance southwards along the coast.

199. **Clivina costata**, sp. nov.

Colour piceous: palpi, base of antennæ, and two hind pairs of legs ferruginous (in one of the examples, probably immature, the elytra and underside are castaneous).

Head similar in ground plan to that of *memnonia*, the clypeal ridge more elevated, facial carinæ obliterated in front and hardly extending beyond mid-eye level, the pore on vertex elongate and forming a sulcus, the occiput with a series of

longitudinal sulci stretching across it. *Prothorax* differing only in the deeper median line and more evidently interrupted transverse sulcus. *Elytra* with the shoulders dentate (but the tooth is at the base of interval 6, not on the border), striole less developed, striæ much deeper and intervals costuliform, intervals 3, 5, and 7 united, forming a slightly raised area at apex, 7 and 8 uniting in a carina at base, which just reaches the tooth.

Length, 9–10 mm.

MADRAS : Nilgiri Hills (*H. L. Andrewes*).

Type in my collection.

200. **Clivina westwoodi**. *Putz.*

Clivina westwoodi, Putzeys *, Rév. Gén. p. 109 ; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 373.
Clivina castanea, Putzeys (not Westw.), Postscr. p. 35.

Colour piceous : palpi, joints 1 to 3 of antennæ, and legs testaceous.

Head with prominent eyes, clypeus truncate, with its median part in advance of the wings, the angle on each side projecting forwards as a small tooth, wings small, with the outer angle somewhat obtuse, separated from median part by a slight ridge ; frontal plates with an obtuse angle at sides, separated from wings by a slight notch, surface irregular but convex ; clypeal ridge slight, with a small raised knob at each end ; frontal impressions deep, suture obsolete ; middle of front irregularly strigose-rugose, with a large pore on vertex, neck constriction entire, punctate, joined on each side by the facial sulci, surface sparsely and minutely punctate ; labrum 7-setose, mandibles short and wide ; mentum swollen at base, the tooth a little longer than lobes ; antennæ rather fine, joint 2 subclavate, a little longer than 3. *Prothorax* slightly transverse, convex, quadrate, sides nearly straight, parallel, the front angles hardly advanced, hind angles with a short obtuse tooth ; median line joining front transverse sulcus, which is uninterrupted and practically reaches margin at extremities, surface with a punctate figure Y on each side, sometimes obsolete. *Elytra* twice as long as wide, convex, parallel ; striæ moderately impressed and finely crenulate, 1 to 4 free at base, 5 joining 6, 7 ending behind shoulder, striole vestigial ; intervals slightly convex, 3 with four small punctures adjoining stria 3, 8 slightly carinate at apex, narrow but not carinate behind shoulder. *Sternum* : prosternal ridge rather narrow and slightly sulcate. *Venter* smooth, the two pores on each side of last segment distant. *Legs* : protibiæ with a slight sulcus on basal half, 4-digitate, the uppermost denticulation very small ; mesotibiæ

finely crenulate, with few but rather long bristles, a small spur a little above apex.

Length, 6–7 mm.

UNITED PROVINCES: Dehra Dun (*N. C. Chatterjee*). CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*). BOMBAY: Belgaum (*H. E. Andrewes*), Khanapur, Belgaum district (*H. V. Kemball*). CEYLON: Colombo (*G. M. Henry*). JAPAN.

Type in the Brussels Museum.

Putzeys described under this name two examples, one from Ceylon and one from New Guinea, belonging to different species. As his description applies better to the Ceylon than to the New Guinea specimen, I retain his name for the former; the latter belongs to the species which he subsequently described under the name of *C. wallacei*.

In the type the Y-figure is quite undeveloped and the stalk only shows very faintly. In the Colombo and Khanapur examples it is strongly developed, faintly only in that from Nagpur, as also in a second example from the same locality in the Deutsch. Ent. Mus. In the Belgaum example only the stalk is visible, but it is rather deeply impressed.

201. **Clivina costulipennis**, *Bates*.

Clivina costulipennis, Bates*, Ann. Mus. Civ. Gen. xxxii, 1892, p. 281; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 373.

Colour piceous: elytra very dark red, palpi, base of antennæ, and two hind pairs of legs ferruginous.

Head rather narrow, eyes deeply enchased, only a small portion visible from above; wings and median part of clypeus fused, the point of junction marked by a blunt tooth in front and a ridge behind, front edge bordered and slightly emarginate, wings sharply rounded at middle; frontal plates convex, elongate, gently rounded, separated from clypeus by a shallow notch; clypeal ridge represented by a slight rounded boss, sulcus wanting, though there is a depression across front; frontal impressions wide and uneven, facial carinæ obliquely interrupted in front, facial sulci distinct, neck constriction formed by coarse punctures, sides of head bordered and emarginate, extending beyond eyes behind, and then sharply rounded to neck; a pore on vertex, back of clypeus and front covered with punctures of different sizes; labrum 7-setose, mandibles short but sharp; mentum dilated at base, lobes truncate, externally angulate, the margin of apex running obliquely back to the tooth, which is wide and triangular at apex; antennæ moniliform, joint 2 very little longer than 3. *Prothorax* convex, quadrate, as long as wide, sides parallel, front angles visible, a well marked tooth at hind angles, the pore a little removed from them, the furrow inside basal border

crenulate ; median line deep and wide, not reaching extremities, front transverse sulcus punctate, interrupted at middle, practically reaching margin at sides, surface nearly smooth, with two small patches of punctures on each side and a furrow at base, forming more or less of a letter Y. *Elytra* convex, not quite twice as long as wide, widest a little behind middle, shoulders rather prominent, base strongly tuberculate, sides very gently rounded ; striæ deep, finely punctate, 1 joining 2 at base, the rest free, a short striole present ; intervals costiform, 3 with four pores adjoining stria 3, 5 to 7 joining at base, 3, 5, and 7 joining and forming a ridge at apex, 8 cariniform throughout, but not reaching shoulder. *Sternum* coarsely punctate at sides, prosternal ridge rather narrow, sulcate. *Venter* punctate at sides, the pores on apical segment distant. *Legs* : profemora not dilated and hardly sulcate beneath ; protibiæ not sulcate, tridigitate, the teeth rather short, a rudimentary tooth above them ; mesotibiæ narrow, with few bristles, a short spur near apex.

Length, 5·5 mm.

BURMA : Palon in Pegu (*L. Fea*) ; Dawna Hills, Misty Hollow to Sukil, 2100–2500 feet (*F H. Gravely*—Ind. Mus.) ; Salween Div. ASSAM : Shillong (Pusa coll.) ; Kobo, 400 feet (*S. W Kemp*—Abor Expedition, Ind. Mus.). STRAITS SETTLEMENTS : Perak (*Doherty*—Brit. Mus.) ; Penang (*G. E. Bryant*). SUMATRA : Mount Singgalang (*E. Jacobson*).

Type (Palon) in the Genoa Museum.

202. Clivina helferi, *Putz.*

Clivina helferi, Putzeys *, Rév. Gén. p. 126 ; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, pp. 375 and 376 ; id., Ann. Mag. Nat. Hist. (9) xix, 1927, p. 109.

Clivina grammica, Putzeys *, Compt. rend. Soc. Ent. Belg. 1877, p. 41.

Clivina debilis, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 278.

Clivina invalida, Andrewes, Ann. Mag. Nat. Hist. (9) iii, 1919, p. 470 ; id. in Mission Babault Ind. Carab. 1924, p. 12.

Colour red brown, ferruginous, or even testaceous, head and prothorax a little darker than elytra ; palpi, base of antennæ, middle and hind legs testaceous.

As a rule lighter in colour and smaller than *lobata*, the median part of clypeus only lightly emarginate, hardly bordered, and with rounded angles, wings placed further back, truncate, wider than long, separated from median part by a distinct notch, a much smaller notch separating them from frontal plates, which project very little laterally, clypeal ridge gently raised, the setiferous pores very large, suture obsolete, facial carinæ distinct behind, some large punctures on each side just

within them, a shallow pore on vertex, the neck constriction just marked by a few punctures at sides, mentum with nearly parallel sides, the sinus shallow, the tooth small and rather blunt. Prothorax with a faint Y-figure on each side, sometimes obsolete, formed by very small punctures, the stalk forming a shallow furrow, which does not quite reach base. Elytra with striæ 3 and 4 free at base, striole short. Venter with the last segment punctate, the two pores on each side distant. Profemora not much dilated beneath, apex of trochanters prominent, protibiæ only vaguely sulcate, mesotibiæ with a long spur at apical third.

Length, 3·5–5 mm.

BENGAL: Calcutta (*F. H. Gravely*); Khargpur (*R. Hodgson*); Parbatipur (*E. A. d'Abreu*); Sunderbans (*F. W. Champion*). BIHAR: Pusa (*H. M. Lefroy, T. B. Fletcher*, and *C. Paiva*); Dinapur (*Caunter*). ORISSA: Balugaon (*N. Annandale*). MADRAS: Barkuda Island in Lake Chilka (*N. Annandale*). BURMA: Tharrawaddy and Prome (*G. Q. Corbett*); Rangoon (*L. Fea*); Mandalay (*H. L. Andrewes*).

Type lost; that of *grammica* in the Stettin Museum; that of *debilis* in the Genoa Civic Museum. Cotypes of the first two are in the Brussels Museum. The name *invalida* was suggested to replace the preoccupied one of *debilis* before the identity of this species with those of Putzeys was known.

203. **Clivina gamma**, sp. nov.

Colour castaneous: palpi testaceous, antennæ brown, apex of mandibles black.

Head rather narrow, eyes moderately prominent; clypeus with its median part slightly emarginate, bordered, wings small, angulate, placed a little further back than median part, though not quite fused with it and not separated by a notch; frontal plates separated by a slight notch, oblique, finely bordered, somewhat convex but very uneven; clypeal ridge distinct, curved (convex forwards), sometimes with some irregular transverse striation behind it, the suture wanting; vertex with a large shallow, circular, bordered depression, a little truncate in front; frontal impressions deep, irregular, vaguely punctate, forking at mid-eye level, a deeper sulcus continuing behind eye, a shallower and punctate sulcus curving inwards behind the central depression, the short, sharp, facial carina between them; no actual neck constriction, but sides of head with some punctures, surface generally more or less rugose and vaguely punctate; labrum slightly emarginate, 7-setose, mandibles moderately sharp and long; mentum inflated at base, the sinus deep, lobes very little rounded externally, the tooth long, narrow, and sharp, as long as lobes; antennæ moniliform, dilated towards apex, joint 2 much longer than 3.

Prothorax moderately convex, a shade longer than wide, quadrate, but slightly contracted in front, front angles visible, hind ones marked by a small tooth, sides of base straight, median part a little produced ; median line and front transverse sulcus clearly marked, latter not reaching border ; each side of disk on basal two-thirds with a figure in the form of the Greek letter γ, the two arms in front composed of irregular punctures, the outer longer than the inner one, the stalk at base deeply impressed. *Elytra* moderately convex, about twice as long as wide, with parallel sides, the border at shoulder crenulate ; striæ deep and clearly punctate, 1 joining 2 at base, 3 free, 4 joining 5, striole short and slight, intervals convex, 3 with four small pores adjoining stria 3, 8 carinate throughout, reaching but hardly rounding shoulder. *Sternum* smooth, prosternal ridge sulcate, widening sharply behind, the process concave at apex, with a curved ridge behind it, the declivity oblique, mesosternum also sulcate, metasternum with a strongly impressed angular groove between mesocoxæ. *Venter* smooth, but the last segment coarsely punctate, and with the two pores on each side widely separated. *Legs* : protrochanters toothed at apex, profemora hardly dilated beneath, protibiæ strongly sulcate on upper surface, 4-digitate, mesotibiæ serrate, with a spur at apical third.

Length, 4·5–5·5 mm.

INDIA, without more precise locality.

Type in the British Museum.

The species is closely allied to *C. ypsilon*, Dej., from South-East Europe and Turkestan, but differs in its narrower form, the large circular depression on head, and the greater development of the figure on each side of the prothorax.

204. **Clivina spatulifera**, sp. nov.

Colour dark flavous, front margin of head, mandibles, and suture of elytra piceous. (One example is much darker—brown, with the head piceous.)

Head nearly as wide as prothorax, eyes moderately prominent ; clypeus with its median part slightly emarginate, bordered, separated from the inconspicuous wings by a small notch ; frontal plates separated by a slight notch, oblique, bordered, not very convex ; clypeal ridge transverse, conspicuous, the suture behind it hardly impressed ; front and vertex with three vague elongate impressions, sometimes also with a transverse impression ; frontal impressions shallow, but widening out on each side to a deep rounded foveole on each side of clypeal ridge, the facial carinæ and sulci short but evident ; neck constriction wanting, though there is a slight transverse sulcus on each side, surface generally uneven

but impunctate; labrum 7-setose, mandibles moderately sharp, mentum with a very small emargination, in which is a small sharp tooth, shorter than lobes; antennæ short, moniliform, joint 2 hardly longer than 3. *Prothorax* moderately convex, slightly longer than wide, quadrate, though slightly contracted behind, and widest before middle, apex faintly emarginate, a distinct notch just within the front angles, sides a little indented by front lateral pore, hind angles without tooth, sides of base rounded; median line deep, extremely deep close to base, front transverse sulcus rather faint, subpunctate, not reaching margin, surface smooth. *Elytra* moderately convex, a little wider than prothorax, two-thirds as long again as wide, sides parallel, shoulders square, border behind them crenulate; striæ deep, with shallow, closely placed, inconspicuous punctures, 1 to 4 free at base, 5 joining 6, striole rather slight; intervals convex, very convex close to base, 3 with four pores adjoining stria 3, 8 carinate at extremities, not quite reaching shoulder in front. *Sternum* smooth, prosternal ridge narrow and laterally compressed, not sulcate, metasternal process unbordered. *Venter* smooth, alutaceous at sides, last segment with the two pores on each side widely separated. *Legs*: profemora deeply grooved beneath, very little dilated, protibiæ not sulcate on upper surface, the digitations not very long, spatulate, as is the spur, mesotibiæ with a short spur.

Length, 4·75–5 mm.

BURMA: Tavoy district, Maungmagan and Tavoy (*R. N. Parker* —Forest Res. Inst.).

Type in the British Museum.

Not nearly allied to any other species; it will be readily identified by the spatulate digitations of the protibiæ and the unusual form of the prothorax, which from behind appears cleft and almost bilobed.

205. Clivina bengalensis, *Putz.*

Clivina bengalensis, Putzeys*, Mon. p. 603 (85); id., Rév. Gén. p. 137; id., Ann. Soc. Ent. Belg. 1868, t. 1. f. 11; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 377.

Clivina pluridentata, Putzeys*, Compt. rend. Soc. Ent. Belg. 1877, p. 42.

Clivina scissa, Bates*, Ann. Mus. Civ. Gen. xxxii, 1892, p. 278.

Colour testaceous, moderately shiny: mandibles and margins of head in front, sutural interval of elytra, meso- and metasternum, and ventral surface more or less piceous.

Head wide, eyes prominent; clypeus with median part rather strongly emarginate, the angles right and sharp, wings truncate, nearly on a level with median part, separated from it on each side by a rounded notch, from which a shallow

channel runs back to the clypeal pores, outer angles right; frontal plates narrow, gently rounded, almost fused with clypeus, raised on inner side into a small, smooth, rounded boss; clypeal ridge slight, suture obsolete, frontal impressions shallow, almost linear, converging slightly behind and then diverging, some oblique striation between them and eye; no pore on vertex, no neck constriction, surface microscopically punctulate; labrum 7-setose; mandibles not long but moderately sharp; mentum swollen at middle of base, lobes truncate, tooth wide, rounded at apex and slightly concave beneath, a deep depression on each side of it; antennæ moderately long, subfiliform, joint 1=2+3, which are equal. *Prothorax* moderately convex, slightly transverse, sides nearly parallel, curving inwards close to front angles, which are a little advanced, a very small tooth representing hind angles, the hind pore somewhat removed from margin; median line fairly deep, front transverse sulcus obsolete, its position indicated by a row of underlying dark pores; surface microscopically punctulate and with some faint transverse wrinkles. *Elytra* moderately convex, about twice as long as wide, sides very gently rounded, a little pointed behind; striæ rather shallow, finely crenulate, 1 joining 2 at base, 3 to 5 free, 6 ending just behind shoulder and 7 a little further back, a short striole present; intervals moderately convex, flatter towards apex, 3 with four large pores adjoining stria 3, 7 and 8 united, forming a slight humeral carina, 8 carinate at apex, marginal series of pores twice interrupted. Both upper and under surface are covered by a microsculpture of more or less isodiametric meshes. *Sternum*: prosternal ridge narrow and deeply sulcate. *Venter* with pores on last segment widely distant. *Legs*: protibiæ without sulcus, 4-denticulate, the teeth long except the uppermost, which is very small, mesotibiæ narrow, with few crenulations or bristles, a long narrow spur a little above apex.

Length, 6–9 mm.

BENGAL: Calcutta. BIHAR: Pusa. BURMA: Rangoon. I have seen very few examples.

Type in Mr. René Oberthür's collection; that of *scissa* in the Genoa Civic Museum. The type of *pluridentata* ought to be in the Stettin Museum, but is not to be found there. Of the three examples sent by Dr. Dohrn to Putzeys, two are in the Brussels Museum; both of these bear the label "Calcutta," and one of them, which may be treated as the type, is also labelled with the specific name. This species differs from *bengalensis* only in its much smaller size, 6 mm. instead of 8 mm. or 9 mm., and in certain minute details which I consider as individual only.

206. **Clivina pileolata**, *Bates*.

Clivina pileolata, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 278.

Colour black or piceous: palpi, base of antennæ, and two hind pairs of legs more or less testaceous-red.

While agreeing with *lobata* in many of its characters, this species differs in some important points. The median part of clypeus is only slightly emarginate, bordered, the angles at sides somewhat rounded, the wings placed further back, wider than long, bounded on each side by a rectangular notch, frontal plates narrow, clypeus moderately convex, suture rather wide and not very deep, neck constriction punctate and widely interrupted, the whole of the back of the head flattened and raised into a more or less pentagonal area, truncate in front, pointed behind, its surface minutely punctulate and rugose, with a pore at middle, surface generally uneven, mentum with rather long lobes, rounded at apex, and a sharply pointed carinate tooth. Prothorax quadrate, the hind angles marked by a slight sinuation of the border only, median line fine, the whole surface, except margins, punctate, with a slight impression on each side at middle of base. Elytra with stria 1 joining 2, 3 free, 4 joining 5, no striole. Venter moderately, last segment closely, punctate, the two pores on each side distant. Protibiæ strongly sulcate, the profemora hardly dilated beneath, the trochanters projecting as a distinct tooth, mesotibiæ with a strong spur at apical third.

Length, 5·5–6·5 mm.

ASSAM: Mangaldai (*S. W Kemp*). BURMA: Rangoon (*L. Fea, G. Q. Corbett*, and *E. A. d'Abreu*); Katha and Palon (*L. Fea*); Tharrawaddy and Toungoo (*G. Q. Corbett*).

Type in the Genoa Civic Museum.

207. **Clivina extensicollis**, *Putz*.

Clivina extensicollis, Putzeys, Mon. p. 601 (83); id., Rév. Gén. p. 115; Bouchard, Ann. Soc. Ent. Fr. 1903, p. 169; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, pp. 375 and 376.

Colour black, shiny; palpi, antennæ, and two hind pairs of legs more or less ferruginous, front legs piceous.

Head with the eyes moderately prominent, clypeus with the wings and median part completely fused, widely and slightly emarginate, bordered; frontal plates separated from clypeus on each side by a slight indentation, their sides obliquely truncate, the surface a little convex behind; clypeal ridge formed by a slightly raised, transverse, oval area, behind which is the short, wide, and fairly deep clypeal suture; facial sulci fairly deep, uneven, joining the clypeal suture in front;

vertex with a vaguely defined, though fairly deep longitudinal sulcus, the surface uneven and punctate, but without neck constriction, one or two transverse rugæ on each side of front; labrum bisinuate, 7-setose; mandibles wide, very short and blunt; mentum rather concave, sides nearly parallel, a carina at middle, the tooth wide and not very sharp; antennæ short, moniliform, dilated towards apex, joint 2 longer than 3. *Prothorax* very convex, a third wider than head and quite a fourth longer than wide, sides straight, converging very gently in front, widest at hind angles, which are without tooth, front angles rounded and inconspicuous; median line moderately deep, though rather fine behind, joining and crossing the front transverse impression, which is deep, impunctate, and reaches the front margin; surface smooth, but with some fairly conspicuous transverse striæ, particularly near the sides. *Elytra* convex, as wide as prothorax and rather more than twice as long as wide, sides parallel, apex somewhat pointed; striæ moderately deep, punctate, 1 to 3 free at base, 4 to 7 converging and meeting near shoulder, striole vestigial; intervals convex, 3 with three pores, one in front and two towards apex, all adjoining stria 3 (I could not detect the normal pore 2 in the examples examined), 8 carinate behind shoulder. *Sternum*: prosternal ridge narrow, only faintly sulcate, proepisterna with some transverse wrinkling at sides. *Venter* with the apical segment finely punctate, the two pores distant. *Legs* with the profemora strongly dilated, the end of the trochanter protruding as a tooth beneath, protibiæ not sulcate, with very short digitations, mesotibiæ with a spur above apex.

Length, 5·5–6·25 mm.

BENGAL: Calcutta. UNITED PROVINCES: New Forest, Dehra Dun (*G. D. Bhasin*). BORNEO. JAVA. SUMATRA. LOMBOK.

Type not traced.

The type came from Java, and according to Putzeys was in his own collection. This is now in the Brussels Museum, where there are two examples of the species, both of them labelled Calcutta. There is also an example at Rennes, two from Borneo in the British Museum, and I have in my own collection a specimen from Lombok.

In these circumstances I was not proposing to include the species in the Indian fauna until quite recently a specimen reached me from the Forest Research Institute, taken in the vicinity of Dehra Dun, which makes the "Calcutta" locality a more probable one.

The above description has been drawn up from the Dehra Dun example, which has been placed in the British Museum.

208. **Clivina castanea**, *Westw.*

Clivina castanea, Westwood *, Proc. Zool. Soc. Lond. 1837, p. 128; Putzeys, Rév. Gén. p. 131 (note); Andrewes, Trans. Ent. Soc. Lond. 1919, p. 179; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 377.

Eupalamus clivinoides, Schmidt-Goebel in litt., Faun. Col. Birm. t. 3. f. 4; Putzeys, Rév. Gén. p. 130; Andrewes, Trans. Ent. Soc. Lond. 1923, p. 58.

Clivina parryi, Putzeys *, Postscr. p. 60; id., Rév. Gén. p. 130; id., Ann. Soc. Ent. Belg. 1868, t. 1. f. 9; id., Compt. rend. Soc. Ent. Belg. 1875, p. 49; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72; id., Ann. Mus. Civ. Gen. xxvii, 1889, p. 100; id., Ann. Soc. Ent. Fr. 1889, p. 262; id., Ann. Mus. Civ. Gen. xxxii, 1892, p. 279.

Clivina lata, Putzeys *, Rév. Gén. p. 131; Bates, Trans. Ent. Soc. Lond. 1873, p. 238; id., Trans. Ent. Soc. Lond. 1876, p. 3; Vuillet, Insecta, ii, 1912, p. 18.

Colour black, shiny: palpi testaceous, antennæ and tarsi brown or piceous.

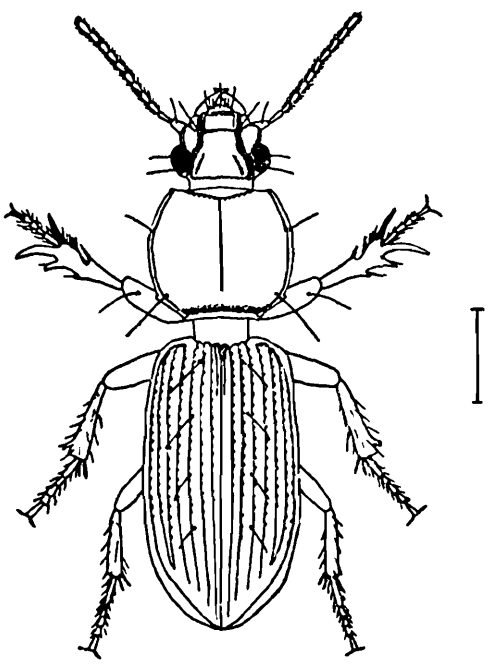


Fig. 54.—*Clivina castanea*, Westw.

Head moderately wide, eyes prominent; median part of clypeus bordered, slightly emarginate, the angles right but rounded, wings small, rounded, concave, almost reaching level of median part and separated from it by an angular notch, with a ridge behind; frontal plates convex, bordered, rounded externally; clypeal surface lightly raised, the suture and frontal impressions both deep, joining at sides, so that the whole forms more or less of a semicircle; facial sulci shallow and inconspicuous, a punctate constriction behind eyes, a rounded

pore on vertex, surface microscopically punctulate; labrum 7-setose, margin obtusely angulate at middle, mandibles short and wide; mentum concave beneath, with a deep sinus, an oblique carina on each side running forwards and outwards to outer angle of truncated lobes, the tooth carinate, dilated and bluntly pointed at apex; antennæ submoniliform, joint 2 hardly longer than 3. *Prothorax* very convex, moderately transverse, widest behind middle, rather strongly contracted in front; sides gently rounded, front angles not projecting, hind angles marked by a tooth, sides of base straight; median line and front transverse sulcus clearly marked, latter reaching margin, surface with a few transverse wrinkles. *Elytra* convex, twice as long as wide, the sides almost parallel; striæ rather deep and finely punctate, 1 to 3 free at base, 4 to 7 all meeting above base of 5, a moderately long but very fine striole present; intervals convex, 3 with four fairly distinct pores, the first close to base, adjoining stria 2, the other three adjoining stria 3, 8 carinate at apex and for a short distance behind shoulder. *Sternum* smooth, prosternal ridge moderately narrow and slightly sulcate. *Venter* smooth, the pores on apical segment close together. *Legs*: protibiæ without sulcus, tridenticulate, the teeth relatively short; mesotibiæ narrow, hardly crenulate, with few bristles, a short spur a little above apex.

Length, 7–10 mm.

S.E. Asia, extending westwards to India, northwards to Japan, and southwards as far as New Guinea, though not recorded from Australia.

Type (Philippine Is.) in the British Museum; that of *parryi* in the Brussels Museum; that of *lata* in Mr. René Oberthür's collection.

In the Prague Museum there are a number of examples taken by Helfer, but nothing to indicate which was the specimen figured by Schmidt-Goebel as *Eupalamus clivinoides*.

209. Clivina lobata, *Bon.*

Clivina lobata, Bonelli *, Obs. Ent. ii, Mém. Acad. Sci. Turin, 1813, p. 481; Dejean, Spec. Gen. i, 1825, p. 414; Putzeys, Mon. p. 599 (81); id., Rév. Gén. p. 120; Redtenbacher, Reis. Novar. Zool. ii, 1867, p. 8; Putzeys, Ann. Soc. Ent. Belg. 1868, t. 1. f. 8; Andrewes, Trans. Ent. Soc. Lond. 1919, p. 209; id., Rec. Ind. Mus. xxii, 1921, p. 340; id., Ann. Mus. Civ. Gen. xlix, 1922, p. 392; id., Trans. Ent. Soc. Lond. 1924, p. 462; id. in Mission Babault Ind. Carab. 1924, p. 11; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 375.

Clivina anceps, Putzeys *, Postscr. p. 50; id., Rév. Gén. p. 124.

Clivina hydropica, Putzeys *, Rév. Gén. p. 121.

Clivina angularis, Putzeys *, Rév. Gén. p. 122; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 276.

Clivina capitata, Putzeys, Rév. Gén. p. 122.
Clivina divaricata, Putzeys *, Rév. Gén. p. 122.
Clivina læviceps, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 277; Andrewes in Mission Babault Ind. Carab. 1924, p. 12.

Colour dark piceous red, legs and antennæ a little lighter, palpi testaceous.

Head with prominent eyes, median part of clypeus rather deeply emarginate, bordered, the angles a little rounded, wings rounded, slightly concave, nearly as far advanced as median part, and separated from it by an angular notch; frontal plates separated from clypeus by a similar notch, convex, bordered, oblique in front, then sharply rounded to eye; surface of clypeus transversely raised behind, the suture

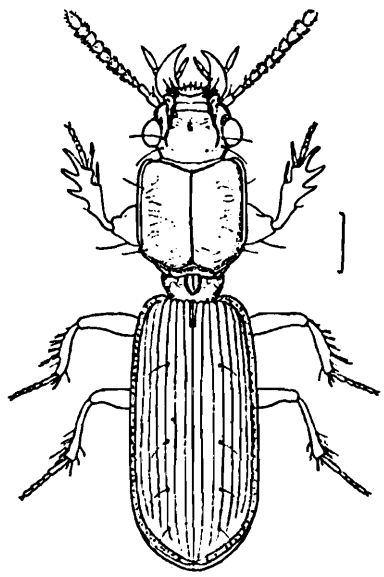


Fig. 55.—*Clivina lobata*, Bon.

moderately deep but somewhat variable; frontal impressions deep and irregular, diverging behind, facial carinæ rather short and more or less interrupted at middle, facial sulci slight; neck constriction slight, minutely punctate, more or less interrupted at middle, a pore on vertex, surface generally smooth, but both front and clypeus are sometimes vaguely transversely rugose; labrum truncate, 7-setose, mandibles moderately sharp; mentum wide, tooth wide, but rather sharply pointed in front, as long as lobes; antennæ moniliform, joint 2 much longer than 3. *Prothorax* moderately convex, quadrate, about as long as wide, sides parallel, front angles hardly projecting, hind angles marked by a small tooth, the pore a little removed from margin, sides of base nearly straight; median line and front transverse sulcus clearly marked, latter reaching margin at extremities, surface slightly wrinkled and sometimes with a few minute punctures. *Elytra* moderately convex, quite

twice as long as wide, parallel, with well marked shoulders; striæ fairly deep and minutely punctate, 1 joining 2 at base, 3 free, 4 joining 5, 6 and 7 ending further back, striole fairly long; intervals moderately convex, 3 with four pores (often elongate) adjoining stria 3, 8 carinate at both ends, rounding shoulder in front and ending opposite stria 5. *Sternum*: prosternum with a few punctures, its episterna transversely striate, prosternal ridge moderately narrow and slightly sulcate. *Venter* nearly smooth, the two pores on each side of last segment close together. *Legs*: profemora beneath dilated at middle and longitudinally sulcate, toothed at apex, the point of the trochanters projecting at base; protibiæ sulcate on upper surface, with three long, slender digitations and a small upper tooth; mesotibiæ narrow, with few but long bristles and a long spur at apical third.

Length, 4–7 mm.

INDIA. BURMA. Widely distributed, but not apparently extending to Ceylon.

Type in the Turin Museum. Of the remaining examples sent by Schüppel to Bonelli and Dejean, one (the type of Dejean) is now in Mr. René Oberthür's collection, another is in the Brussels Museum, and yet another, probably from the same source, is in the Chevrolat Collection at the Oxford University Museum. Types of *anceps* and *angularis* in the Brussels Museum; those of *hydropica*, *capitata*, and *divaricata* in Mr. René Oberthür's collection; that of *læviceps* in the Genoa Civic Museum. *C. divaricata* was said to come from the Deccan, no doubt a mistake for Dacca.

The species is a very variable one, in colour, in size, and in the proportions of the various parts of the body. The front of the clypeus is always more or less deeply emarginate, the wings are usually rounded, but occasionally subangulate externally, the surface is often smooth, but sometimes slightly transversely rugose.

210. Clivina mustela, *Andr.*

Clivina mustela, Andrewes, Spol. Zeyl. xii, 1923, p. 226.

Colour dark chestnut-red, elytra piceous, with reddish border and suture; joints 1 and 2 of antennæ, palpi, and tarsi testaceous.

Head with median part of clypeus only faintly emarginate, wing small and rounded, nearly reaching level of median part, a fairly deep notch on each side, frontal plates angulate in front; clypeal ridge practically obsolete, suture clearly marked but not deep, neck constriction interrupted, vertex somewhat flattened and with a small pore at middle. *Prothorax* convex and quadrate, a well marked tooth at hind

angles; median line and front transverse sulcus deep and clearly cut. *Elytra* parallel, a little more than twice as long as wide; striæ crenulate and moderately deep, 1 to 3 free at base, 4 joining 5, interval 3 with four very large pores, 8 carinate at both ends. Protibiæ not grooved; mesotibiæ with a long spur at some distance from apex. (In the original description I stated that striæ 1 to 4 were free, but practically 4 joins 5.)

Length, 4–4·25 mm.

CEYLON: Anuradhapura (*W Horn*).

Type in my collection. This and a cotype in the collection of the Deutsch. Ent. Mus. are the only examples I have seen.

211. **Clivina brevior**, *Putz.*

Clivina brevior, Putzeys*, Rév. Gén. p. 126; Bates, Ann. Mus. Civ. Gen. xxxii, 1892, p. 277.

Colour black or piceous: palpi, base of antennæ, and two hind pairs of legs ferruginous.

Very near *lobata*, but with the median part of clypeus only lightly emarginate, its surface very slightly raised, the suture deep, with two coarsely punctate and rugose impressions, one on each side, behind it, the vertex slightly flattened, with a pore at middle and some punctures at sides, the neck constriction deep, punctate, and uninterrupted, joint 2 of the antennæ hardly longer than 3. The prothorax and elytra hardly differ, but the striæ on the elytra are usually a little deeper than in *lobata*. The last ventral segment is punctate at base, and the profemora are not much dilated beneath.

Length, 6·75–7 mm.

BIHAR: Pusa. BURMA: Rangoon, Senmigion, and Teinzo (*L. Fea*); Tharrawaddy (*G. Q. Corbett*); Kawkareik (*F H. Gravely*—Ind. Mus.).

Type in Mr. René Oberthür's collection.

212. **Clivina elongatula** *Nietn.*

Clivina elongatula, Nietner*, Journ. As. Soc. Bengal, 1856, xxv, p. 390; id., Ann. Mag. Nat. Hist. (2) xix, 1857, p. 245; Putzeys, Rév. Gén. p. 123; Bates, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 72; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, pp. 375 and 376; id., Ann. Mag. Nat. Hist. (9) xix, 1927, p. 105.

Colour black: palpi testaceous, joints 1 and 2 of antennæ, tarsi, and hind tibiæ red brown.

Darker and narrower than *lobata*, median part of clypeus only moderately emarginate, depressed in front, bordered at sides and in front, wings rounded and concave, clypeus fairly convex behind, the suture deep, frontal impressions deep and irregular, inner side of facial carinæ also deep and

irregular, with some large pores inside them behind, the carinæ sometimes doubled, a vague groove within the inner one formed by irregular punctures, neck constriction deep and entire, rugosely punctate, front and vertex more or less coarsely punctate, with some fine punctures between the larger ones. Prothorax rather longer than wide, the border minutely crenulate, surface with some punctures both large and small, the former chiefly on disk. Elytra rather more than twice as long as wide, slightly depressed behind shoulders. Venter rather strongly punctate.

Length, 5·75–6·25 mm.

CEYLON: Colombo (*J. Nietner*, *G. Lewis*, and *G. M. Henry*); Murunkan (*G. M. Henry*).

Type in Mr. René Oberthür's collection. According to Putzeys the example in the Chaudoir collection was that from which Nietner drew up his description.

213. **Clivina sectifrons**, *Bates*.

Clivina sectifrons, Bates*, Ann. Mus. Civ. Gen. xxxii, 1892, p. 276.

Colour piceous: underside, base of antennæ, palpi, and legs more or less red.

One of the largest of Indian species, and closely allied to *lobata*. *Head* wide, the median part of clypeus deeply and angularly emarginate, but not bordered, its angles rounded, wings separated by an angular notch, rather wide, nearly as far advanced as median part, projecting somewhat laterally, and a little reflexed, frontal plates convex, separated from wings by a narrow angular notch, with a longitudinal carina behind; clypeal ridge smooth, slightly raised and bounded in front by a slightly curved transverse carina, suture moderately deep, facial carinæ raised behind, semi-interrupted and with an internal facial sulcus; vertex with an elongate impression at middle and an oblique one on each side of it, sides of front and of vertex irregularly rugose, neck constriction narrow, punctate, interrupted at middle, surface generally smooth; mandibles moderately long and sharp, mentum with a very shallow sinus, a double carina at middle, enclosing a narrow groove, lobes with outer angle sharply pointed, the tooth dilated and triangular at apex. *Prothorax* longer than wide, but similar to that of *lobata*, except that the hind angles are marked by a small blunt prominence only. *Elytra* more than twice as long as wide, the striole short, the pores on interval 3 elongate, the distance between them gradually decreasing towards apex. Underside with a few punctures, the pores on last ventral segment close together. Profemora with a rounded dilatation at middle beneath and a tooth at

apex, the trochanters not prominent; protibiæ sulcate at base, mesotibiæ rather slender, with a spine at apical third.

Length, 7–9·5 mm.

BURMA: Rangoon (*L. Fea, G. Q. Corbett*, and *E. A. d'Abreu*); Palon, Tikekee, and Shenmaga (*L. Fea*); Tharrawaddy, Paungde, and Toungoo (*G. Q. Corbett*); Seikpyu, Pakokku, and Pyinmana (*Miss Molesworth*).

Type in the Genoa Civic Museum.

214. **Clivina forcipata**, *Putz.*

Dacca forcipata, Putzeys*, Postscr. p. 68, t. 1. f. 41; id., Rév. Gén. p. 25.

Colour piceous: palpi and joint 1 of antennæ testaceous, legs more or less ferruginous.

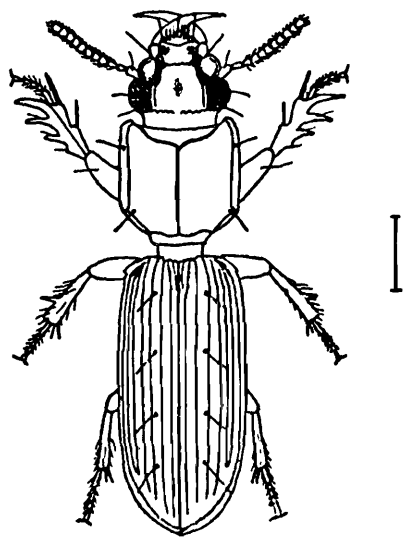


Fig. 56.—*Clivina forcipata*, Putz.

Head with prominent eyes, clypeus with its median part bordered and emarginate, only slightly raised behind, wings flat and rounded, separated by a slight angular notch, projecting a little laterally; frontal plates separated by an angular notch, convex, sharply rounded at sides; clypeus only slightly raised, suture moderately deep; frontal impressions deep, facial carinæ reaching mid-eye level, a large pore on vertex and two small ones, one on each side, a little in advance of it; neck constriction narrow, entire, punctate, surface generally smooth; labrum 9-setose, rather strongly advanced at middle; mandibles very long, narrow, and sharply pointed; mentum carinate in middle, front margin of lobes with an obtuse angle near middle, tooth short, with three minute denticulations at apex; antennæ fine, moniliform, but not dilated at apex, joint 1 quite as long as 2+3, 2 a little longer than 3. *Prothorax* rather longer than wide, convex, quadrate, marginal channel wide, a minute tooth at hind angles; median line and

front transverse sulcus fairly deep, latter reaching margin at extremities, a small tubercle on each side close to base, surface with some slight scratches and minute puncturation. *Elytra* rather more than twice as long as wide, convex, with parallel sides, shoulders slightly dentate ; striæ fairly deep and finely punctate, 1 joining 2, 3 free, 4 joining 5, striole vestigial ; intervals moderately convex, 3 with four pores on the interval, but adjoining stria 3, 8 narrow and carinate throughout, rounding shoulder in front. *Sternum* : proepisterna transversely sulcate, prosternal ridge moderately narrow and slightly sulcate. *Venter* sparsely punctate, the two large pores on each side of last segment somewhat distant. *Legs* : protibiæ faintly sulcate, 4-digitate, profemora not dilated beneath, mesotibiæ with a fairly strong spur at apical third.

Length, 6–7 mm.

BENGAL : Dacca, Kumargaon (*M. Bose*), Calcutta, Sardah (*F. W Champion*), Rajmahal (*N. Annandale*), Mertlik. BIHAR : Pusa (*G. P. Pillai*). MADRAS : Ganjam district, Barkuda Island in Lake Chilka (*N. Annandale*). COCHIN STATE : Chalakudi (*F. H. Gravely*). CEYLON : Kotte (*G. M. Henry*).

Type in the Brussels Museum.

Putzeys thought it necessary to describe a new genus for this species, but the only important character in which it differs from the *lobata* group is in the nine setæ, instead of seven, on the front margin of the labrum. It may easily be recognized from all the other Indian species by its very long and sharply pointed mandibles.

One further species should be mentioned, which, though described as a *Scarites*, should no doubt be placed in the genus *Clivina*. The type is lost, and the description is quite inadequate for purposes of identification :—

Scarites unicolor, Herbst, Nat. Syst. Ins. Käf. x, 1806, p. 265, t. 176. f. 9 ; Putzeys, Mon. p. 626 (108) ; Andrewes, Ann. Mag. Nat. Hist. (9) xix, 1927, p. 98.

" Museum Herbst. A black *Scarites* with smooth prothorax, striate elytra, and front legs toothed on both sides.

" It is somewhat over three lines in length, uniformly black, the prothorax black and shiny, rounded behind, a longitudinal stria down the middle, the elytra are striate and bear some hairs. The front tibiæ are strongly dentate on both sides.

" The native country is the East Indies."

Genus **TRILOPHUS**.

Trilophus, Andrewes, Ann. Mag. Nat. Hist. (9) xx. 1927, p. 263.
Oxydrepanus, Bates, Ann. Mus. Civ. Gen. 1892, p. 283 ; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

TYPE, *Dyschirius interpunctatus*, Putz. (India and Burma.)

Form small, elongate, colour red or testaceous, body winged.

Head small, convex, with a moderately deep longitudinal impression on each side, curving outwards at extremities; eyes rather small, not prominent, with two supraorbital setæ; labrum 5-setose, slightly emarginate in front; clypeus bisetose, convex, triangular, the lateral and median parts fused, the front edge, which forms the base of the triangle, a little emarginate, lateral teeth moderately sharp but not projecting far, the sides of the triangle meeting on middle of front, whence a short fine ridge runs longitudinally backwards, with a deep impression on each side of it; frontal plates convex, a slight longitudinal ridge running back on each side behind them; mandibles short but very sharp; ligula bisetose, truncate, paraglossæ invisible and apparently fused with it; mentum very short, with a slight emargination and a small tooth; maxillæ straight, not very sharp, fringed rather sparsely within with spines, which reach to apex, outer lobe jointed and extending a little beyond inner one; palpi pubescent, with apical joint long, inwardly dilated at base and tapering to a point at apex, in the maxillaries (♂) hollowed out on inner side; antennæ moniliform, fully pubescent from joint 4, though joints 2 and 3 are partially pubescent, 1 and 2 fairly long and about equal. *Prothorax* moderately convex, but not globose, sides bisetose, the border turning inwards before reaching hind lateral pore, and ending just outside it on upper surface; a median line present, front transverse impression obsolete at middle, hind one adjoining basal border, basal foveæ wanting. *Elytra* somewhat depressed, with a deep marginal channel, border rounding shoulder, where there is a tooth, and extending to a point opposite stria 5, sinuate above shoulder and rather hooked at extremity, the hook enclosing a large umbilicate pore, another umbilicate pore on each side of base adjoining suture; 8-striate, the striæ punctate, the eighth stria wanting and probably fused with the ninth in marginal channel, where the series of umbilicate pores, from which here and there long setæ project, is uninterrupted. *Sternum*: metasternum longitudinally sulcate, the process more or less bordered. *Venter* bordered at base between the metacoxæ, segments bisetose, transversely sulcate and with the hind margin crenulate, last segment (♂ ♀) with two setæ on each side. *Legs* adapted for digging, profemora strongly dilated; protibiæ produced at apex into a spiniform process, with two spines along outer margin, mesotibiæ without spur; tarsi about half the width of tibiæ, joint 1 about equal to 2+3, 5=1, protarsi (♂) not dilated. Surface smooth and shining, with or without erect setæ, a microsculpture present on head only.

Range. India, Ceylon, Burma, Siam, Indo-China, Sumatra.

As will be seen, the genus differs in many ways from *Dyschirius*, but is nearly allied to the American genus *Oxydrepanus*,

which it largely resembles in colour and form, in the presence of only eight elytral striæ, and in the unusual form of the elytral border, accompanied by an umbilicate pore, above the shoulder. It differs from *Oxydrepanus* in the form of the head, the side border of the prothorax, and the character of the tarsal joints ; in the American genus these are extremely fine, barely a third as wide as the tibiæ, with joint 1 as long as all the other joints together.

Key to the Species and Varieties.

1 (6)	Elytra with setiferous pores on at least some of the intervals.	
2 (5)	Elytra with setiferous pores on intervals 3 and 5.	
3 (4)	Colour fulvous, average length 2·5 mm..	*interpunctatus*, Putz., [p. 383.
4 (3)	Colour dark red, average length 2·85 mm.	var. *schmidti*, Putz., [p. 384.
5 (2)	Elytra with setiferous pores on intervals 2 to 7	var. *hispidulus*, Putz., [p. 385.
6 (1)	Elytra without any rows of setiferous pores on the intervals (though setæ may be present in the striæ)	var. *impunctatus*, Putz., [p. 385.

215. **Trilophus interpunctatus**, *Putz.*

Dyschirius interpunctatus, Putzeys *, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x. 1867, p. 97; id., Compt. rend. Soc. Ent. Belg. 1878, p. 174.

Oxydrepanus birmanicus, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 283.

Oxydrepanus interpunctatus, Andrewes, Ann. Mag. Nat. Hist. (9) xvii. 1926, p. 378.

Trilophus interpunctatus, Andrewes, Ann. Mag. Nat. Hist. (9) xx, 1927, p. 265.

Colour fulvous : palpi, antennæ, and legs testaceous, underside brown.

Head with the clypeus finely bordered, no neck constriction, eyes somewhat enclosed in genæ behind, antennæ barely reaching base of prothorax, joints 3 and 11 a half longer than wide, 4 to 10 globose, becoming a little transverse towards apex, surface with a distinct microsculpture formed by a reticulation of meshes which are a little longer than wide. *Prothorax* a half wider than head, barely wider than long, widest at basal third, sides very gently rounded in front, strongly behind, the angles completely rounded away ; median line moderately deep, not quite reaching extremities, transverse impression indicated but not impressed, though there is a very slight border close to front angles. *Elytra* elongate-ovate, but with the sides nearly parallel, very slightly wider than prothorax and twice as long as wide, shoulders distinct,

though a little rounded ; striæ moderately impressed, punctate, 1 only entire and deeper near apex, 1 and 2 arising in or near the basal pore, 3 and 4 at a little distance from base, 2 to 7 gradually shortening behind ; intervals slightly convex, 3 and 5 with a row of pores, each bearing an erect seta.

Length, 2·3–2·7 mm.

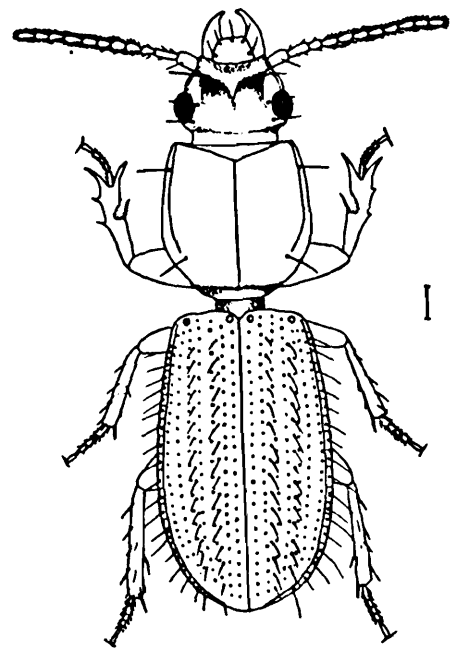


Fig. 57.—*Trilophus interpunctatus*, Putz.

BENGAL : Calcutta ; Sardah (*F W Champion*). BIHAR : Purnea district, Kierpur (*C. Paiva*—Ind. Mus.). UNITED PROVINCES : West Almora (*H. G. Champion*). PUNJAB : Ferozepore (Brit. Mus.). BURMA : Katha and Meetan (*L. Fea*—Genoa Mus.).

Type in Mr. René Oberthür's collection (cotype at Brussels) ; that of *birmanicus* in the Genoa Civic Museum.

215 *a*. **Trilophus interpunctatus**, *Putz.*, var. **schmidti**, *Putz.*

Dyschirius schmidti, Putzeys*, Compt. rend. Soc. Ent. Belg. 1877, p. 41.

Oxydrepanus schmidti, Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

Trilophus interpunctatus, var. *schmidti*, Andrewes, Ann. Mag. Nat. Hist. (9) xx, 1927, p. 265.

Of the four specimens sent by Dohrn to Putzeys, three remain, viz. two in the Stettin Museum and one in the Brussels Museum. Two of these examples are hardly darker and very little larger than the type-form, but the third, which is in the Stettin Museum, and which I propose to treat as the type, is dark red in colour and measures 2·85 mm. in length. It does not appear to differ in other respects from the type-form,

and, if it stood alone, would hardly be worth treating as in any way distinct. As, however, I have before me three other examples from different localities, I propose to retain the name. The Brussels example is labelled "Calcutta Dhn.", but the two Stettin examples are labelled "Birma H.," and no doubt all of them came from Helfer.

ASSAM: "Between Sorbhog and Golakganj on E.B.S. Rly." (*S. W Kemp*—Ind. Mus.). "India" (Brit. Mus.). BURMA (*J. W Helfer*—Stettin Mus.); Shwegu (*H. G. Champion*). ANNAM (Budapest Mus.).

Type in the Stettin Museum.

215 *b*. **Trilophus interpunctatus**, *Putz.*, var. **hispidulus**, *Putz.*

Dyschirius hispidulus, Putzeys *. Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 98.

Oxydrepanus interpunctatus, var. *hispidulus*, Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

Trilophus interpunctatus, var. *hispidulus*, Andrewes, Ann. Mag. Nat. Hist. (9) xx, 1927, p. 265.

This variety is slightly larger and a little darker than the type form, the prothorax a little more contracted in front, the striæ of the elytra rather deeper, intervals 2 to 7 each with a row of setiferous pores. In the Indian specimen the seriate pores are less numerous on the odd than on the even intervals, and on both they are less numerous than in the Siam examples.

CENTRAL PROVINCES: Nagpur (*E. A. d'Abreu*). SIAM.

Type in Mr. René Oberthür's collection; a cotype in the Brussels Museum.

215 *c*. **Trilophus interpunctatus**, *Putz.*, var. **impunctatus**, *Putz.*

Dyschirius impunctatus, Putzeys *, Ann. Soc. Ent. Belg. xi, 1868, p. 10.

Oxydrepanus interpunctatus, var. *impunctatus*, Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

Trilophus interpunctatus, var. *impunctatus*, Andrewes, Ann. Mag. Nat. Hist. (9) xx, 1927, p. 265.

The elytral intervals in this form are impunctate, though setæ, up to half a dozen, may be present along the course of stria 3, one or two behind, occasionally straying on to interval 3; in addition the neck is slightly constricted and punctate at sides.

BENGAL: Calcutta. BIHAR: Purnea district, Kierpur (*C. Paiva*). CEYLON: Negombo (*W Horn*). BURMA (*J. W. Helfer*); Shwegu (*H. G. Champion*); Okkan Reserve, Insein (*D. J. Atkinson*). SIAM. SUMATRA. TONKIN.

Type in the Genoa Civic Museum.

This variety seems to be commoner and to have a wider range than the type form.

Genus **PSILUS.**

Psilus, Putzeys, Compt. rend. Soc. Ent. Belg. 1877, p. 46; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 381.

TYPE, *Ardistomis paradoxa*, Putz. (Burma, Malay Peninsula, Siam, Indo-China, Sumatra, Borneo.)

Form elongate. Body winged. *Head* small, moderately convex, facial sulci deep, parallel in front, divergent behind, neck with or without a constriction; eyes small, not usually prominent, narrowly separated from buccal fissure, with two supraorbital setæ; labrum with three, five, or seven setæ, ciliate at sides; clypeus elongate, bisetose, with the lateral and median parts completely fused, the angles rounded, truncate in front, finely bordered, transversely depressed behind border, its surface behind forming a convex area, which is longer than wide, clypeal suture shallow; frontal plates narrow, not separated from clypeus along margin by any emargination, convex in front, carinate behind; mandibles long, narrow, edentate, outer margin straight, hooked, and very sharp at apex; ligula narrow, bisetose at apex, the paraglossæ extending rather beyond it as very slender filaments; mentum with its sides almost straight, only slightly contracted in front, a sharp external angle at apex of lobes, emargination and tooth both very slight; maxillæ slender, slightly hooked at apex, outer lobe jointed and extending rather beyond inner one; maxillary palpi with joint 2 short and wide, 3 and 4 so exactly apposed as to form apparently one elongate terminal joint, strongly dilated inwardly at base, tapering and sharply pointed at apex, labials very small, 2 bisetose, 3 hardly longer, pointed at apex; antennæ with joint 1 constricted, a little stouter and longer than 2, which is attached to it excentrically, fully pubescent from and including joint 4. *Prothorax* convex, trapeziform, gently narrowed in front, strongly constricted behind, sides bisetose, bordered at least to hind lateral pore; a median line and front transverse impression both present, but no basal foveæ. *Elytra* moderately convex, elongate-oval, border sometimes dentate or crenulate, rounding shoulder, which is dentate, thickened along outer part of base and ending abruptly—almost forming a tooth—opposite stria 3 or 4, four setiferous tubercles across inner part of base, two on each side; 8-striate (stria 8 being apparently fused with 9 in the marginal channel), the striæ entire and punctate or crenulate, marginal channel wide, extending round the shoulders in front as far as the border, with an uninterrupted series of umbilicate pores, wider near apex, where the series of pores is somewhat removed from margin, no scutellary striole; intervals convex, 3 sometimes seriate-punctate, 8 curving round behind to apex and joined in turn by all the other intervals.

Sternum: prosternal process unbordered, narrowed and sulcate in front; metasternum longitudinally sulcate, the process bordered. *Venter* bordered at base between the metacoxæ, the segments bisetose, transversely sulcate, the hind margin of each crenulate, last segment with two rather distant marginal setæ. *Legs* stout, profemora much dilated; protibiæ produced at apex into a spiniform process, two well developed spurs along outer margin; mesotibiæ without spur; protarsi with joint 1 about as long as the rest together. The surface of the body sometimes shows a distinct microsculpture.

Range. Burma, Malay Peninsula, Siam, Indo-China, Sumatra, Borneo.

Key to the Species.

1 (2) Head with a longitudinal ridge on each side of vertex, prothorax with border reaching base, elytra with border crenulate, interval 3 tripunctate .. *paradoxus*, Putz., [p. 387.

2 (1) Head without longitudinal ridges, prothorax with border not extending beyond hind lateral pore, elytral border smooth, interval 3 impunctate *porphyreus*, Andr., [p. 389.

216. **Psilus paradoxus**, *Putz.*

Ardistomis paradoxa, Putzeys *, Ann. Soc. Ent. Belg. xi, 1868, p. 21.

Psilus acutipalpis, Putzeys *, Compt. rend. Soc. Ent. Belg. 1877, p. 46.

Clivina trapezicollis, Bates *, Ann. Soc. Ent. Fr. 1889, p. 263; id., Bull. Soc. Ent. Fr. 1889, p. 240.

Psilus paradoxus, Andrewes, Trans. Ent. Soc. Lond. 1921, p. 176; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 381; id., Ann. Mag. Nat. Hist. (9) xx, 1927, p. 266.

Colour dark red or piceous: palpi and antennæ flavous, latter darker towards apex.

Head with its sides narrowed in front, facial sulci very deep and parallel in front, diverging sharply behind and curving round eyes; labrum 7-setose; clypeus truncate and finely bordered, forming a convex oblong area behind, produced at middle to a point, clypeal suture not very deep, in the form of a V, sometimes produced backwards at middle as a slight sulcus; vertex with a short longitudinal ridge on each side, bounded inwardly by a sulcus, which is in the same line as the front part of the facial sulci; neck with a narrow, punctate constriction, deeper at sides; antennæ fairly stout, reaching base of prothorax, joint 3 about two-thirds as long

as 2, the apical joints longer than wide and hardly moniliform; surface punctate along clypeal suture and on vertex, with a more or less visible microsculpture formed by a reticulation of isodiametric meshes. *Prothorax* nearly two-thirds wider than head, as long as wide, widest just in front of hind lateral seta, sides gently contracted in front, slightly rounded, border reaching base, hind angle with only a rudimentary tooth; median line and front transverse impression rather fine, latter crenulate, barely reaching margin at extremities, surface more or less punctate in two longitudinal patches on each side, with a very distinct microsculpture formed by meshes generally rather wider than long. *Elytra* oval, shoulders rather oblique, clearly dentate, border at base reaching a point opposite

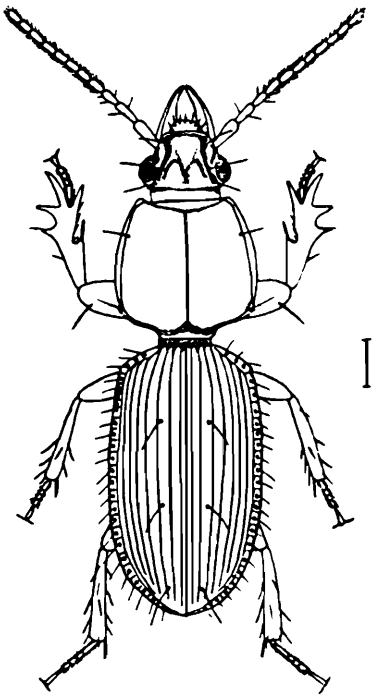


Fig. 58.—*Psilus paradoxus*, Putz.

stria 4, more or less crenulate along sides, barely a sixth wider than prothorax, a little less than twice as long as wide; striæ deep and microscopically crenulate, intervals convex, 3 with three pores at about a fourth, a half, and three-fourths, the front one adjoining stria 3, the two hind ones adjoining stria 2, surface shiny, with hardly any appreciable microsculpture. *Legs*: protibiæ with well developed spines, the apical digitation curved and longer than the spur; all tarsi with joint 1 as long as the rest together.

Length, 3·75–4·5 mm.

Burma (*J. W. Helfer*). Malay Peninsula. Siam. Indo-China. Sumatra. Borneo.

Type in the Genoa Civic Museum ; that of *acutipalpis* in the Stettin Museum, with a cotype in the Brussels Museum ; that of *trapezicollis* in the Paris Museum.

In the Burmese examples the head and prothorax are less punctate, and the hind angles of the prothorax have a more evident tooth than in specimens from the other localities.

217. **Psilus porphyreus**, *Andr.*

Psilus porphyreus, Andrewes, Spol. Zeyl. xii, 1923, p. 227 ; id., Ann. Mag. Nat. Hist. (9) xx, 1927, p. 266.

Colour dark red : palpi, antennæ, and tarsi fulvous.

Head with its sides narrowed in front, facial sulci very deep, uneven, diverging at extremities, widening out opposite eye, again contracted and carried round inner margin of eye behind ; labrum 5-setose, clypeus truncate in front, convex behind, clypeal suture deep and straight, frontal plates forming small rounded bosses at sides, neck not constricted, though there is a short transverse sulcus on each side behind eye, vertex and neck tumid, eyes small, rather flat, with very large facets, antennæ moniliform, reaching base of prothorax, surface smooth and shiny, but with a faint microsculpture of isodiametric meshes. *Prothorax* trapezoidal, very convex, nearly twice as wide as head, and about as long as wide, narrowed in front, sides nearly straight, border only reaching hind lateral pore, hind angles quite rounded away and without tooth ; median line fine, deeper near base, front transverse impression fairly deep, entire, joining lateral channel at front angle, surface smooth. *Elytra* convex, oval, a little wider than prothorax, shoulders with a slight tooth, basal border reaching stria 3, side border smooth ; striæ fairly deep, punctate, 1 only reaching apex, though the others nearly do so, intervals convex and smooth, 3 without setiferous pores. *Legs* : protarsi with joint 1 equal to the other joints together ; meso- and metatarsi with joint 1 equalling 2 + 3.

Length, 2·3 mm.

CEYLON : Kotte (*G. M. Henry*).

Type in the British Museum. The type is unique.

The species is very near *P.* (*Dyschirius*) *doriæ*, Putz., from Borneo, which was unknown to me when my original description was prepared. It differs from Putzeys' species in its rather larger size and deeper colour, the elytral striæ deeper and more strongly punctate, the intervals much more convex, and the border of the elytra not dentate.

Genus **DYSCHIRIUS**.

Dyschirius, Panzer, Index Entomologicus, 1813, p. 67 ; Stephens, Ill. Brit. Ent., Mandibulata, i, 1827, pp. 37 and 40 ; Putzeys, Mon. des *Clivina* et genres voisins, Mém. Liége, ii, 1846, p. 524 (4) ; Lacordaire, Gen. Col. i, 1854, p. 202 ; Schiødte, Naturh. Tidsskr. 1866, pp. 161–3 (in Danish) ; Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 32 ; Fleischer, Best. Tab. Eur. Col. xxxix, Scaritini, 1899, p. 8 ; Müller, Best. Tab. *Dyschirius*-Arten Eur., Kol. Rundsch. 1922, p. 33 ; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 377

Phreoryctes, Schmidt-Goebel, Faun Col. Birm. 1846 (Cover).

TYPE, *Carabus globosus*, Herbst. (Northern palæarctic region.) (Panzer mentions two species, *D. thoracicus*, Rossi, and *D. gibbus*, F As there is doubt regarding the identity of *thoracicus*, *globosus*, of which *gibbus* is a synonym, has been selected as genotype.)

Form small, usually elongate, colour black or brassy. *Head* rather small, convex, with a deep longitudinal furrow on each side called the " facial sulcus," curving outwards at extremities, and attaining the front margin on each side of clypeus, neck rarely constricted ; eyes moderately prominent, rather narrowly separated from buccal fissure, with two supraorbital setæ ; labrum sexsetose, its front margin with a more or less deep angular emargination, the sides ciliate ; clypeus of variable form, bisetose, the sides (" wings " of *Clivina*) not distinctly separated from the median part, front margin sometimes curved, but more generally truncate at middle, more rarely dentate, the sides usually projecting forward as sharp or moderately rounded teeth ; sides in front forming more or less convex, rounded " frontal plates," the antennæ inserted beneath them ; mandibles short and wide, edentate ; ligula bisetose, truncate, paraglossæ narrow, slender, and free, extending far beyond ligula ; mentum moderately emarginate, with a short tooth in the emargination ; maxillæ straight, blunt, dilated at apex, outer lobe jointed and extending beyond the inner one ; palpi subacuminate, last joint in ♂ securiform, obliquely truncate and hollowed out at extremity, in ♀ spindle-shaped (but in appearance the difference between the sexes is less marked than this description indicates), joint 2 of labials bisetose ; antennæ pubescent from joint 3, moniliform. *Prothorax* very convex, usually globose, sides bisetose, generally bordered from front angle to hind marginal pore (sometimes a little beyond it), unbordered from the pore to median part of base in contact with peduncle ; median line usually present, and (except in *porosus*) a transverse impression behind the front margin, hind transverse impression adjoining basal border, basal foveæ wanting. *Elytra* convex, basal border usually wanting, a pore generally present at base on each side of suture ;

9-striate, the striæ punctate, at least on basal half, either entire or shortened behind, 3 usually tripunctate, but sometimes with more numerous pores (*mahratta*) or with two only (*disjunctus*), 8 sometimes obsolete or wanting, with one or two pores, called " apical pores," adjoining it behind, 9 with the umbilicate series reduced and widely interrupted (though minute pores are often present), from one to three pores, referred to as " posthumeral pores," each accompanied by two small tubercles, behind the shoulder. *Sternum*: metasternal process bordered. *Venter* bordered at base between the metacoxæ, last segment (♂ ♀) with two setæ on each side. *Legs* stout and adapted for digging, protibiæ produced at apex into a long spiniform process, with two teeth along outer margin, mesotibiæ without spur, protarsi (♂) not dilated. The surface of the body is smooth and shiny, and, except occasionally on the back of the head, practically without microsculpture (Indian species).

Range. World-wide.

The larva of *D. thoracicus*, Rossi (or, as there is doubt about Rossi's species, it would perhaps be more correct to say *D. arenosus*, Steph.), has been described by Schiødte (Nat. Tidsskr. 1867, pp. 500–3, t. 18. ff. 17-23), but nothing is known of the life-history of any of the Indian species. The habitat is generally in the vicinity of water, and often on sandy, or sometimes saline ground.

The chief characters which have been utilized to differentiate the numerous palæarctic species are the form of the front margin of the clypeus, the degree to which the prothorax is bordered at the sides, the number of dorsal, apical, and posthumeral setigerous pores, the presence or absence of a basal elytral pore and also a basal border, and the character of the external denticulations of the protibiæ. With the exception of the last, these characters also prove useful in distinguishing the Indian species, and help has also been afforded by the very variable sculpture of the head and of the eighth stria.

Key to the Species.

1 (52) Prothorax impunctate, with a transverse impression behind front margin.

2 (5) Clypeus with its front margin tridentate, elytra with a fine basal border, protibiæ with well developed spines, two apical pores.

3 (4) Elytra three-fourths longer than wide, shoulders somewhat rounded ... *seistanus*, sp. nov., [p. 394.

4 (3) Elytra about a half longer than wide, shoulders very square . . *tricuspis*, sp. nov., [p. 395.

5 (2) Clypeus with its front margin not tridentate.

6 (49)	Prothorax with lateral border extending from front angle at least to hind pore.	
7 (46)	Elytra with a basal pore on each side.	
8 (31)	Elytra with striæ not shortened behind, though often shallower on apical third (but see *tamil*).	
9 (20)	Elytra with stria 8 entire and not evidently shallower than the other striæ, median line usually deeper close to base.	
10 (19)	Elytra with striæ 7 and 8 not deeper than the other striæ on apical third.	
11 (12)	Clypeus with front margin advanced in middle, interval 3 of elytra with five to seven pores, interval 5 with three or four pores ..	*mahratta*, sp. nov., [p. 396.
12 (11)	Clypeus with front margin truncate (or only slightly advanced), interval 3 with three pores, interval 5 impunctate.	
13 (16)	Head with transverse striæ or rugæ, elytra somewhat dilated behind, evidently wider than prothorax.	
14 (15)	Prothorax with median line and elytra with stria 8 moderately and equally deep throughout.	*mahratta*, var. *paucipunctus*, var nov., p. 397.
15 (14)	Prothorax with median line very deep close to base, elytra with stria 8 shallower at apical third ...	*bengalensis*, sp. nov., [p. 397.
16 (13)	Head irregularly rugose or with a central carina, elytra with parallel sides, not much wider than prothorax.	
17 (18)	Head with a central longitudinal carina	*asper*, sp. nov., p. 398.
18 (17)	Head irregularly rugose	*asper*, var. *intricatus*, var nov., p. 398.
19 (10)	Elytra with striæ 7 and 8 deeper than the rest on apical third, head smooth, clypeal suture shallow .	*perfectus*, sp. nov., [p. 399.
20 (9)	Elytra with stria 8 obsolete, interrupted, or at least much shallower, than the other striæ, median line of prothorax not or only a little deeper near base.	
21 (26)	Elytra with stria 8 present, but interrupted.	
22 (25)	Prothorax at least as wide as long, two or three posthumeral pores.	
23 (24)	Elytra with stria 8 on basal half as deep as the other striæ, three posthumeral pores	*nitens*, Putz., p. 399.
24 (23)	Elytra with stria 8 on basal half formed by minute punctures, two posthumeral pores ..	*hingstoni*, sp. nov., [p. 400.

25 (22) Prothorax a little longer than wide, one posthumeral pore . . .. *lacustris*, sp. nov., [p. 401.

26 (21) Elytra with stria 8 wanting, one apical pore.

27 (28) Average length 3·25 mm. .... *verticalis*, Putz., p. 402.

28 (27) Average length 2·20 mm.

29 (30) Labrum normal } *verticalis*, var. *tenuescens*, var. nov., p. 403.

30 (29) Labrum bidentate . ... } *verticalis*, var. *bispicifer*, var. nov., p. 403.

31 (8) Elytra with the striæ shortened behind, leaving a smooth space at apex.

32 (43) Head with clypeal suture deep, two apical and usually three posthumeral pores.

33 (42) Elytra with square shoulders, stria 1 arising in the basal pore, three posthumeral pores.

34 (41) Elytra with stria 8 at base rudimentary.

35 (38) Elytral striæ (where impressed) increasing in length outwards from 2 to 7.

36 (37) Elytra flavous at apex, striæ deep, terminating behind rather abruptly, transverse impression on prothorax impunctate. .. .. *speculifer*, sp. nov., [p. 403.

37 (36) Elytra dark at apex (border ferruginous), striæ not deep, melting away gradually behind, transverse impression on prothorax punctate *æger*, sp. nov., p. 404.

38 (35) Elytral striæ (where impressed) not increasing in length outwards from 2 to 7.

39 (40) Clypeal suture interrupted, median line on prothorax present but very fine, colour brassy-black. Average length 2·9 mm. .. .. *variabilis*, sp. nov., [p. 405.

40 (39) Clypeal suture uninterrupted, median line on prothorax wanting, colour brassy-brown. Average length 2·35 mm. . .. . *indicus*, Putz., p. 406.

41 (34) Elytra with stria 8 at base as deep and extending as far towards apex as 7, striæ deep, apex of elytra pale testaceous .. .. *championi*, sp. nov., [p. 406.

42 (33) Elytra with shoulders rounded, basal pore isolated, two posthumeral pores. *singhalensis*, Andr., [p. 407.

43 (32) Head with clypeal suture represented by a depression on each side, with a longitudinal carina between the depressions, one or two apical, and three posthumeral pores.

44 (45) Head with a transverse impression across neck, elytral striæ impressed to a fourth from apex, two apical pores. *constrictus*, sp. nov., [p. 408.

45 (44) Head without transverse impression across neck, elytral striæ impressed to a fifth or sixth from apex, one apical pore. .. . *tamil*, sp. nov., p. 408.

46 (7) Elytra without basal pore on each side.

47 (48) Prothorax elongate, subcylindrical, elytra more than twice as long as wide, base bordered, two apical and three posthumeral pores. .. *mitodes*, sp. nov., p. 409.

48 (47) Prothorax subglobose, elytra less than twice as long as wide, base unbordered, one apical and one posthumeral pore. .. .... *ladakensis*, sp. nov., [p. 410.

49 (6) Prothorax with lateral border not reaching hind marginal pore.

50 (51) Head with a bituberculate transverse clypeal ridge, lateral border of prothorax not quite reaching hind pore, elytra with three dorsal pores . *bifrons*, sp. nov., p. 411.

51 (50) Head without transverse ridge, lateral border of prothorax not extending backwards beyond front pore, elytra with two dorsal pores .. *disjunctus*, sp. nov., [p. 411.

52 (1) Prothorax punctate, without transverse impression, head with four ridges meeting in a peak on middle of front *porosus*, Putz., p. 412.

218. **Dyschirius seistanus**, sp. nov.

Colour brassy: palpi and joints 1 to 3 of antennæ dark ferruginous, protibiæ dark red, rest of antennæ and legs piceous.

Head: clypeus convex, front margin tridentate, teeth well developed, a little rounded at apex, the outer a little longer than the median one (in type, but in two other examples the median tooth is much shorter), clypeal suture deep, a slight transverse impression across front behind it, and a further faint depression across vertex, facial sulci deep, vaguely duplicated behind, wide and very uneven in front, surface otherwise nearly smooth, neck with a microsculpture of isodiametric meshes, labrum only slightly emarginate. *Prothorax* subglobose, a third wider than head, as long as wide, border extending a little beyond hind lateral pore; median line very clearly cut, a little deeper at base, not quite reaching front margin, transverse impression moderately impressed, the surface longitudinally striate behind it, surface generally transversely striate and microscopically punctulate. *Elytra* elongate-oval, shoulders evident, but not prominent, basal border fine but distinct, a fourth wider than prothorax and three-fourths longer than wide; striæ entire, moderately impressed

but shallower behind, punctate on basal two-thirds, 1 arising in a pore, hardly deeper than the other striæ except near base and apex, 8 faint but generally traceable throughout, only moderately impressed at apex, two ill-defined apical pores, two rather slight posthumeral pores some little way behind shoulder;

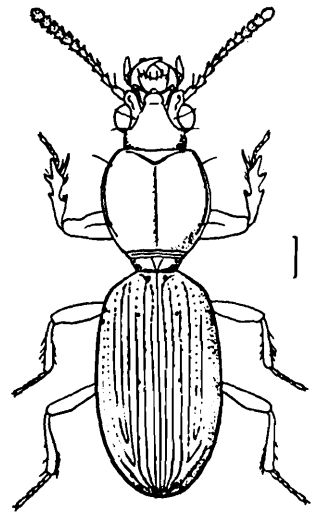


Fig. 59.—*Dyschirius seistanus*, Andr.

intervals moderately convex, 1 slightly raised, 3 with three pores adjoining stria 3. *Legs*: protibiæ with well-developed spines, the spur as long as the apical digitation.

Length, 3·5 mm.

SEISTAN: "Edge of stream of saline water, near Labi Baring, 11.xii.18, Sta. 23 B.S."

Type in the Indian Museum, Calcutta.

This is the species which I referred to as "*Dyschirius sp.*" in 'Records of the Indian Museum,' vol. xviii, pt. ii, 1919, p. 99, in a paper which formed part of the Report on the Aquatic Fauna of Seistan.

The three examples on which the species is described agree in everything but the median clypeal tooth, which is well developed in the type, but very much shorter, though still evidently a tooth, in the other two examples.

219. **Dyschirius tricuspis**, sp. nov.

Colour brassy-black: joints 1 to 3 of antennæ, apex of palpi, tibiæ, and tarsi more or less piceous red.

Head: clypeus convex (also rugose in type), with front margin tridentate, median tooth hardly shorter than the outer ones, clypeal suture deep, facial sulci deep and uneven, middle of front with some vague cross-striation, vertex and neck smooth, latter with a microsculpture of isodiametric meshes

at sides. *Prothorax* globose, a third wider than head, nearly as long as wide, side border entire to hind lateral pore ; median line and transverse impression both moderately deep, latter crenulate and with some faint longitudinal striation behind it, surface otherwise smooth. *Elytra* ovate, with very square shoulders and not much dilated behind, slightly depressed at basal fourth, base bordered, a half wider than prothorax and rather more than a half longer than wide, widest a little behind middle ; fully striate, the striæ deep and coarsely punctate in front, crenulate and much shallower behind, 1 and 2 arising in a pore, 8 as deep as the other striæ, two apical pores, marginal channel deep behind shoulder, with three ill-defined posthumeral pores ; intervals convex, 1 raised, 2 to 4 widening in front, three dorsal pores adjoining stria 3. *Legs* : protibiæ with well-developed spines, the apical digitation as long as the spur.

Length, 3·5 mm.

UNITED PROVINCES : West Almora and Ranikhet, Kosi River, 3000 feet (*H. G. Champion*) ; Dehra Dun, Rikhikesh (*G. D. Bhasin*).

Type in the British Museum.

220. **Dyschirius mahratta**, sp. nov.

Colour brassy, sometimes with purplish reflections on the elytra : joint 1 of antennæ, palpi, apical border of elytra and sides of base ferruginous ; rest of antennæ and front legs piceous ; two hind pairs of legs (femora sometimes darker) pale ferruginous.

Head : clypeus slightly convex, its front margin bisinuate, almost tridentate, the lateral teeth short, median part obtuse and a little shorter, clypeal suture fine, facial sulci deep, front with a variable amount of cross-striation, a transverse impression across vertex (in type), surface nearly smooth, though very uneven at sides, neck at sides with a micro-sculpture of isodiametric meshes. *Prothorax* globose, about a third wider than head, but very little wider than long, border entire to hind lateral pore ; median line fairly deep, transverse impression punctate (the punctures varying much in size), surface smooth with a few vague transverse striæ. *Elytra* a little depressed behind base, very slightly dilated behind, shoulders square, base unbordered (though sometimes there are traces of a border), a fourth wider than prothorax and three-fourths longer than wide ; fully punctate-striate, both striæ and punctures much deeper in front, 1 (and generally 2 also) arising in the basal pore, 8 as deep as the other striæ, two apical pores, three posthumeral pores; intervals convex, 1 raised, 3 with five to seven pores, 5 with three or four pores, all on

the interval, but near striæ 3 and 5 respectively. *Legs*: protibial spines well developed, the apical digitation evidently longer than the spur.

Length, 3 mm.

BOMBAY: Belgaum (*H. E. Andrewes*), two examples taken under stones near water, Dec. 1886. CEYLON: Anuradhapura (*W Horn*—Deutsch. Ent. Mus.), 2 ex., 1899.

Type in my collection.

220 *a*. **Dyschirius mahratta**, sp. nov., var. **paucipunctus**, var. nov.

In some examples the median part of the clypeus is truncate (or only very slightly advanced), and at the same time the number of pores on interval 3 is reduced to three, those on 5 having disappeared altogether. Apparently it is the first, third, and fifth pores which disappear. The specimens secured by Dr. Horn and myself were taken at the same time and place respectively as those of the type form.

BOMBAY: Belgaum (*H. E. Andrewes*); Poona (*G. M. Bryant*), May 1898. CEYLON: Anuradhapura (*W Horn*—Deutsch. Ent. Mus.); Colombo (*L. Biró*—Budapest Mus.).

Type in my collection.

221. **Dyschirius bengalensis**, sp. nov.

Colour brassy: palpi, joints 1 to 3 of antennæ (rest fuscous), two hind pairs of legs, and apical border of elytra dark ferruginous, front legs piceous.

Head: clypeus convex, more or less triangular, front margin truncate in middle, bordered, lateral teeth small, not far advanced, site of clypeal suture occupied by irregular, more or less transverse rugæ, which extend on to front, facial sulci deep, irregular, some oblique striæ branching from them inwards behind and nearly meeting on neck, surface very irregular at sides, a microsculpture of isodiametric meshes at back of neck. *Prothorax* globose, a third wider than head and a little wider than long, border extending to hind lateral pore; median line fairly deep, very deep near base, joining and passing through the transverse impression, which is formed chiefly by pores, behind which the surface is longitudinally striate, surface generally shiny, with some faint cross-striation. *Elytra* ovate, with very square shoulders, slightly depressed behind base, no basal border, a third wider than prothorax and a half longer than wide; fully striate, striæ fairly deep near base, shallower behind, punctate, the punctures disappearing on apical third, 1 deep at base, arising in the pore, 8 entire though very shallow at about apical fourth, two apical pores, three posthumeral pores, the hindmost very small; intervals

moderately convex, 1 slightly raised, 3 with three pores on the interval. *Legs*: protibiæ with upper spine slight, lower one sharp and well-developed, apical digitation about as long as spur.

Length, 2·7–3·1 mm.

BENGAL: Sunderbans (*F W Champion*); Calcutta (*F. H. Gravely* and *C. Paiva*—Ind. Mus.).

Type in the British Museum.

The example from the Sunderbans (type) is considerably larger than the Calcutta specimens.

222. **Dyschirius asper**, sp. nov.

Colour brassy: palpi, joints 1 to 3 of antennæ, two hind pairs of legs, and apical border of elytra flavous, profemora and rest of antennæ piceous, protibiæ reddish.

Head: clypeus triangular, convex, the oblique sides rather raised, front margin bordered, arcuate, the lateral teeth obtuse and very little advanced, site of clypeal suture occupied by 1 to 3 fine, irregular, transverse ridges, from which a short longitudinal ridge runs back a little way across middle of front (or sometimes this ridge is also produced forwards, so that the transverse ridges join it on each side), an irregular transverse impression just before neck, accompanied by a few punctures. *Prothorax* subglobose, but narrowed in front and widest at basal third, a fourth wider than head and as long as wide, side border extending rather beyond hind lateral pore; median line deep, very deep behind, transverse impression moderately deep, crenulate. *Elytra* parallel, with rather square shoulders, no basal border, a fourth wider than prothorax, and four-fifths longer than wide; fully striate, the striæ fairly deep, punctate, a little shallower near apex, where the punctures disappear, 1 arising in basal pore and a little deeper than the other striæ, 8 as deep as 7 and running parallel with it, two apical pores, three posthumeral pores, the front one some little distance in advance of the other two; intervals convex, 1 raised, 3 with three pores on the interval, but very near stria 3. *Legs*: protibiæ with upper spine very slight, lower one well developed, apical digitation curving somewhat outwards, as long as spur.

Length, 3–3·2 mm.

BENGAL: Sardah (*F W Champion*). "India" (British Museum).

Type in the British Museum.

222 *a*. **Dyschirius asper**, sp. nov., var. **intricatus**, var. nov.

A solitary example from Pusa (Bihar), formerly in the Pusa collection, though agreeing in other respects with the

type form, differs in the sculpture of the head. The longitudinal ridge is wanting, and the whole front is covered by fine irregular rugæ, while across the vertex there are some irregular longitudinal striæ.

This form may prove to be a mere aberration, but, if other similar specimens are found, it may be desirable to treat it as a distinct species.

Type in the British Museum.

223. **Dyschirius perfectus**, sp. nov.

Colour bronze: basal joints of palpi, joint 1 of antennæ, two hind pairs of legs, and apical border of elytra ferruginous; front legs brown; apical joint of palpi and rest of antennæ fuscous.

Head: clypeus convex and more or less triangular, front margin bordered, bisinuate, the median part a little advanced, lateral teeth blunt and not much in advance of middle, clypeal suture generally ill-defined, subrugose, facial sulci fine behind, widening out in front, surface at sides very irregular and subrugose, vertex smooth, back of head with a microsculpture of isodiametric meshes. *Prothorax* globose, a fourth wider than head, and practically as long as wide, border extending a little beyond hind lateral pore; median line deep, very deep on basal half, transverse impression moderately deep, faintly crenulate. *Elytra* ovate, shoulders rather square, no basal border, a third wider than prothorax and a half longer than wide; fully striate, striæ moderately impressed, shallower near apex, punctate on basal two-thirds, 1 arising in basal pore, 1 and 2 rather deeper than the others, 8 as deep as 7 and running parallel with it throughout, two apical and three posthumeral pores; intervals moderately convex, 1 slightly raised, 3 with three pores on the interval. *Legs*: protibiæ with the upper spine small but distinct, lower one sharp and well developed, apical digitation curving downwards and outwards, hardly longer than spur.

Length, 2·6–2·9 mm.

United Provinces: Haldwani (*H. G. Champion*). Bombay (*G. Lewis*—Brit. Mus.).

Type in the British Museum.

Two examples in the Oxford University Museum, labelled "India, Capt. Boys," do not quite accord with the other specimens, and are treated as a variety.

224. **Dyschirius nitens**, *Putz.*

Dyschirius nitens, Putzeys*, Compt. rend. Soc. Ent. Belg. 1878, p. 173; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

Colour brassy: palpi, base of antennæ, two hind pairs of legs, and apex of elytra ferruginous, the pale colour on the

elytra running forward a little way on intervals 8 and 9; front legs brown.

Head: clypeus convex, arcuate in front, median part bordered, lateral teeth small, not projecting far, concave on their upper surface, clypeal suture and facial sulci deep, joining to form a curved impression, the sulci divergent behind and ending on each side in a finely punctate area behind eye, surface otherwise smooth, but very uneven at sides. *Prothorax* globose, a third wider than head, only a shade wider than long, border entire to hind lateral pore; median line fine but distinct and a little deeper at extremities, transverse impression moderately deep, formed chiefly by punctures. *Elytra* ovate, with square shoulders, a little depressed behind base, which is unbordered, a third wider than prothorax, and a half longer than wide; striæ deep throughout, only a little less deep near apex, coarsely punctate on basal half, 1 and 2 arising together in basal pore, 1 only slightly deeper than the other striæ, 8 rather fine and interrupted for some little distance behind, two apical pores, the hind larger than the front one, three posthumeral pores; intervals very convex, 1 hardly raised, 3 with three pores on the interval. *Legs*: protibiæ with upper spine obsolete, lower one small and blunt, apical digitation curving slightly outwards, longer than the spur.

Length, 2·45 mm.

BENGAL: Calcutta.

Type in the Brussels Museum.

The author described this species from three examples sent to him by Dr. Dohrn. Of these he no doubt retained one and returned the other two. Dohrn's collection is now in the Stettin Museum, but the two specimens are missing, and that in the Putzeys collection, now at the Brussels Museum, is the only one remaining and the only one I have seen.

225. **Dyschirius hingstoni**, sp. nov.

Colour metallic green: palpi, joint 1 of antennæ (rest brown), two hind pairs of legs, and apical border of elytra ferruginous, front legs piceous.

Head: clypeus convex and bearing a transverse carina, front margin bordered, arcuate, lateral teeth somewhat advanced but not very sharp, a short longitudinal carina connecting the transverse one with front, the surface round it uneven, clypeal suture wanting in middle but visible at sides, facial sulci deep and entire, a short transverse impression sometimes present on middle of neck, surface with some scattered microscopical punctures. *Prothorax* globose, but narrowed in front and widest at basal third, nearly a half wider than head, as long as wide, border extending some

way beyond hind lateral pore ; median line deep, transverse impression moderately deep, more or less punctate, with a slight depression behind each puncture. *Elytra* elongate-ovate, but with rather square shoulders, base unbordered, slightly wider than prothorax, and twice as long as wide ; striæ fairly deep and punctate, the punctures disappearing on apical third, 1 arising in basal pore and deeper than the other striæ, 4 and 5 deeper close to base and diverging a little outwards, 8 just traceable in front by microscopic punctures, deep for some little distance near apex, one apical pore, two small posthumeral pores, distant from each other ; intervals moderately convex, 1 raised, 3 with three pores adjoining stria 3. *Legs*: protibiæ with upper spine wanting, lower one distinct but blunt, apical digitation thick and blunt, curving slightly downwards, hardly longer than the spur, which curves inwards.

Length, 3·5–4 mm.

BENGAL : Calcutta (*F. H. Gravely*—Ind. Mus.). BIHAR : Pusa (*G. P. Pillai*—Pusa coll.). UNITED PROVINCES : Sitapur (*H. G. Champion*) ; Fyzabad (*R. W G. Hingston*—Brit. Mus.). " India " (*Capt. Boys*—Oxford Mus.).

Type in the British Museum.

226. **Dyschirius lacustris**, sp. nov.

Colour brassy : palpi, joints 1 and 2 of antennæ, two hind pairs of legs and apical border of elytra more or less ferruginous ; rest of antennæ and profemora piceous ; protibiæ reddish.

Head : clypeus convex, transverse, front margin gently arcuate, bordered, lateral teeth moderately advanced, clypeal suture deep, facial sulci deep, sinuate at mid-eye level, vertex a little uneven and with a few punctures. *Prothorax* subglobose, but with sides very gently rounded in front, widest at basal third, a third wider than head, very little wider than long, side border extending rather beyond hind lateral pore ; median line very fine, passing through the transverse impression in front, without quite joining it, and deep at that point, not quite reaching front margin, the impression formed chiefly by pores, behind which the surface is impressed. *Elytra* elongate-ovate, shoulders evident but a little rounded, base unbordered, very shiny, and with two large pores, very little wider than prothorax, but practically twice as long as wide ; striæ not very deep and finely punctate, a little shallower behind, but the punctures are visible nearly to apex, 1 only vaguely connected with the basal pore, slightly deeper than the others, 8 formed by minute punctures, but deep quite close to apex, one apical pore in type (two pores in the second specimen), a single posthumeral pore ; intervals only slightly convex, 1 a little raised, 3 with three pores on the interval at

a sixth, a half, and five-sixths. *Legs* : protibiæ with the spines moderately developed, the spur a little longer than the apical digitation, which curves slightly downwards.

Length, 3·75 mm.

MADRAS : Ganjam district, Barkuda Island in Lake Chilka (*N Annandale* and *F H. Gravely*—Ind. Mus.), one of the two examples taken " at light."

Type in the Indian Museum, Calcutta.

This is the species referred to as " *Dyschirius sp.*" in my paper on the " Fauna of an Island in the Lake Chilka " in Rec. Ind. Mus. vol. xxii, pt. iv. No. 23, 1921, p. 341. It is the only Indian species so far met with in which there has been any variability in the number of apical pores on the elytra.

227. **Dyschirius verticalis**, *Putz.*

Dyschirius verticalis, Putzeys *, Compt. rend. Soc. Ent. Belg. 1878, p. 172 ; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.
Dyschirius æneobrachialis, Bates *, Ann. Mus. Civ. Gen. xxxii, 1892, p. 283.

Colour æneous, elytra bright, head and prothorax darker ; palpi, antennæ, apical border of elytra, and front legs ferruginous, two hind pairs of legs somewhat paler.

Head : clypeus depressed in front, margin truncate, lateral teeth blunt, a transverse ridge behind, connected by a fine longitudinal carina with one or more very irregular transverse carinæ across front, clypeal suture not apparent, facial sulci deep, some microscopical punctures on vertex. *Prothorax* subglobose, nearly a half wider than head, as long as wide, widest at a third from base, sides rather gently narrowed in front, so that the front angles are perceptible, border extending rather beyond hind lateral pore ; median line very fine on disk, a little deeper at extremities, transverse impression moderately deep, punctate, the surface slightly depressed behind the punctures. *Elytra* elongate-ovate, but with distinct shoulders, base unbordered, very slightly wider than prothorax, three-quarters wider than long, widest a little behind shoulders and tapering to apex, which (for the genus) is rather pointed ; punctate-striate, the striæ fairly deep and moderately punctate in front, shallower and crenulate behind, 1 arising in basal pore, deep on disk, 4 and 5 arising close to base, 2 and 3 usually rather further back, 8 obsolete along sides, but deep close to apex, one apical pore, two posthumeral pores, close together and rather distant from shoulder ; intervals fairly convex, 1 raised, 3 with three pores adjoining stria 3. *Legs* : protibiæ with upper spines small, apical digitation no longer than the spur.

Length, 3–3·5 mm.

BENGAL: Calcutta. UNITED PROVINCES: Sitapur and Haldwani (*H. G. Champion*), once "at light." BURMA: Senmigion (*L. Fea*).

Type in the Brussels Museum; that of *æneobrachialis* in the Genoa Civic Museum.

The species was described on two examples sent by Dr. Dohrn. Putzeys probably returned one and kept the other. Dohrn's specimen, however, is missing in his collection at the Stettin Museum, so that Putzeys' specimen, now in the Brussels Museum, must be regarded as the type.

227 *a*. **Dyschirius verticalis**, *Putz.*, var. **tenuescens**, var. nov.

This variety presents practically all the characters of the type form but is much smaller and somewhat narrower, the prothorax with rather less rounded sides. The colour is similar, except that joints 4 to 11 of the antennæ are more or less fuscous.

Length, 2–2·4 mm.

BENGAL: Sardah (*F W Champion*). BIHAR: Pusa (Pusa coll.).

Type in the British Museum.

227 *b*. **Dyschirius verticalis**, *Putz.*, var. **bispicifer**, var. nov.

The example for which this name is proposed resembles the variety just described, though the elytra are relatively a little longer. It presents, however, the character, remarkable in the genus, of two somewhat reflexed teeth on the middle of the front margin of the labrum.

Length, 2·5 mm.

UNITED PROVINCES: Haldwani (*H. G. Champion*).

Type in the British Museum.

228. **Dyschirius speculifer**, sp. nov.

Colour brassy, basal area of elytra brownish; palpi, joints 1 to 3 of antennæ, and legs more or less ferruginous; apex of elytra flavous, the colour often extending forward to apical third along intervals 7 to 9.

Head: clypeus convex, transversely depressed in front, margin truncate, lateral teeth blunt and projecting little, clypeal suture and facial sulci deep, joining and forming a curved impression, the sulci strongly divergent behind, surface a little uneven at sides. *Prothorax* globose, nearly a half wider than head, a fourth wider than long, border entire to hind lateral pore; median line very faint, transverse impression deep, impunctate but uneven. *Elytra* ovate, but with square shoulders, base unbordered, a fourth wider than prothorax,

a half longer than wide, widest at middle; striæ deep and coarsely punctate to about a third, where the punctures cease, 1 entire, arising in a basal pore, very deep on disk, 2 reaching a fourth from apex, the outer striæ gradually lengthening up to 7, which reaches a sixth from apex, thus leaving a more or less circular and very shiny area at apex, 8 formed by three or four pores only near base, but impressed behind on apical

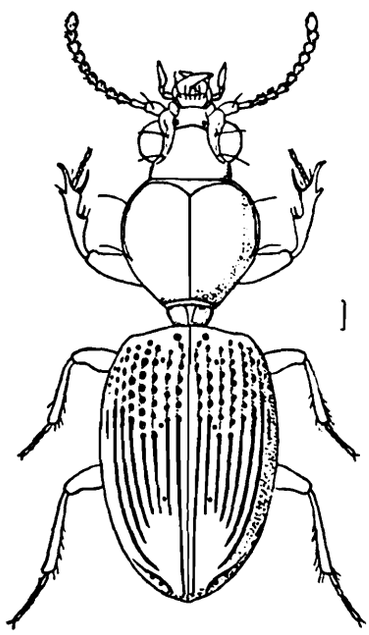


Fig. 60.—*Dyschirius speculifer*, Andr.

sixth, two apical pores, three posthumeral pores; intervals moderately convex, 1 raised, 3 with three pores on the interval. *Legs*: protibiæ with upper spine obsolete, lower one short but sharp, apical digitation slender, curving outwards, longer than spur.

Length, 2·5–2·8 mm.

BENGAL: Sardah (*F W Champion*); Calcutta (*F H. Graveley*—Ind. Mus.), an example "at light." UNITED PROVINCES: Haldwani, including one example from banks of Deoba Nadi (*H. G. Champion*).

Type in the British Museum.

The striation of the elytra in this species is unusual: the basal third is formed by coarse punctures, but from that point to their termination striæ 2 to 7 are deep, parallel, and impunctate, ending abruptly, and enclosing, with the apical margin, a rounded and highly polished area.

229. **Dyschirius æger**, sp. nov.

Similar in most of its characters to *D. speculifer*, but differing considerably in the sculpture of the elytra. *Colour* of upper surface darker, only the apical margin of elytra ferruginous.

(though exceptionally the apex is also pale at sides), profemora usually brown or piceous, apical joints of antennæ sometimes paler. *Head* and *prothorax* similar, except that on the latter the transverse impression is punctate or coarsely crenulate. *Elytra* oval, more contracted in front, so that the shoulders are less evident, striæ only moderately deep, reaching to a third from apex and melting gradually away, though increasing in length outwards, as in *speculifer*, the punctures generally visible to beyond a half, 2, 6, and 7 often traceable as fine lines to near apex.

Length, 2·5–2·8 mm.

UNITED PROVINCES: Kumaon, West Almora and Upper Gumti Valley (*H. G. Champion*).

Type in the British Museum.

230. **Dyschirius variabilis**, sp. nov.

Colour dark brassy: palpi, joints 1 to 3 of antennæ, apex of elytra, and legs more or less ferruginous, rest of antennæ fuscous.

Head: clypeus convex, front margin truncate at middle, bordered, lateral teeth blunt and not far advanced, clypeal suture deep, interrupted at middle, joining facial sulci, which are also deep, diverge strongly behind, and end on each side in a finely punctate area behind eye, surface very uneven at sides. *Prothorax* globose, about a third wider than head, but hardly wider than long, border entire to hind lateral pore; median line extremely fine, transverse impression fairly deep and finely crenulate. *Elytra* oval, but with square shoulders, base unbordered, a fourth wider than prothorax, and not quite two-thirds longer than wide; striæ moderately deep and clearly punctate to about three-fifths, disappearing gradually, leaving apex smooth, 1 entire, arising in basal pore, a little deeper than the rest, remaining striæ gradually shortening outwards, but sometimes traceable by minute punctures over the smooth area at apex, 8 generally represented by two or three punctures only near base, but deep near apex, two apical and three posthumeral pores; intervals moderately convex, 1 raised, 3 with three pores on the interval. *Legs*: protibiæ with upper spine obsolete, lower one short but sharp, apical digitation slender, curving downwards and outwards, longer than spur.

Length, 2·5–3·3 mm.

BENGAL: Calcutta (*F. H. Gravely*—Ind. Mus.), Sardah (*F. W. Champion*). UNITED PROVINCES: West Almora, Ranikhet, Haldwani, and Sitapur (all *H. G. Champion*); Dehra Dun (*M. Cameron*).

Type in the British Museum.

In this extremely variable species the following characters seem constant, viz., lateral border of prothorax entire to hind lateral pore, two apical, three dorsal, and three posthumeral pores, stria 8 always present, though sometimes reduced to a single pore near base. The clypeal suture is sometimes, though rarely, uninterrupted, and in one example the basal pores of the elytra have disappeared. Occasionally darker examples are found with the front legs piceous, and hardly any light colour at apex of elytra.

231. **Dyschirius indicus**, *Putz.*

Dyschirius indicus, Putzeys *, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x, 1867, p. 32; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

Colour brown, elytra dark brown (lighter round margin) with æneous reflections; palpi, antennæ, apex of elytra (more widely at sides), and legs more or less ferruginous.

Head: clypeus convex, truncate in front, lateral teeth small and blunt, clypeal suture and facial sulci very deep, joining and forming a curved impression, surface uneven at sides. *Prothorax* globose, a third wider than head, a fourth wider than long, widest behind middle, border entire to a little beyond hind lateral pore; median line wanting, transverse impression fairly deep and minutely crenulate. *Elytra* ovate, but with evident shoulders, base unbordered, a third wider than prothorax, and rather more than a half longer than wide, widest at middle; striæ punctate and fairly deep, 1 entire, arising in basal pore, the other striæ gradually shortening outwards and obsolete on apical third, 8 formed in front by three or four pores only, but deep near apex, two apical and three rather ill-defined posthumeral pores; intervals moderately convex on disk, 1 raised, 3 with three pores on middle of interval. *Legs*: protibiæ with the spines only slightly developed, apical digitation curved, longer than spur.

Length, 2·2–2·5 mm.

BENGAL: Calcutta. "North India" (*Bacon*).

Type in coll. R. Oberthür.

The species was described from a unique example in Chaudoir's collection, now in Mr. R. Oberthür's collection at Rennes. The above description is drawn up from a second example, labelled "Calcutta," formerly in the Putzeys collection, and now in the Brussels Museum.

232. **Dyschirius championi**, sp. nov.

Colour dark brassy, frequently with purplish reflections; palpi, joints 1 to 3 of antennæ (rest fuscous), tibiæ, tarsi, and base and apex of elytra testaceous, femora reddish.

Head: clypeus convex, its front margin truncate, bordered, lateral teeth blunt and only a little advanced, clypeal suture and facial sulci deep, joining to form a curved impression, the sulci divergent behind and ending on each side in a finely punctate area behind eye, surface uneven at sides. *Prothorax* globose, a third wider than head, and a fourth wider than long, border entire to hind lateral pore; median line very fine, transverse impression moderately deep, subpunctate. *Elytra* ovate, with very square shoulders, base unbordered, a third wider than prothorax and about a half longer than wide; striæ deep, punctate on basal third, subcrenulate to apical third or fourth, leaving apex smooth, 1 and 8 entire, 1 arising in basal pore, 8 very fine on apical third, but deep close to apex, two apical and three posthumeral pores; intervals moderately convex, 1 raised, 3 with three pores on the interval. *Legs*: protibiæ with the upper spine obsolete, lower one small though sharp, apical digitation slender, curving a little downwards, and much longer than the spur.

Length, 2·4–2·7 mm.

UNITED PROVINCES: Haldwani (*H. G. Champion*).

Type in the British Museum.

233. Dyschirius singhalensis, *Andr.*

Dyschirius singhalensis, Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, pp. 379 and 380.

Dyschirius ordinatus, Bates*, Ann. Mag. Nat. Hist. (5) xvii, 1886, p. 73.

Colour: elytra brassy, head and prothorax brassy black; palpi, joints 1 and 2 of antennæ (rest fuscous), two hind pairs of legs, and apical border of elytra more or less ferruginous; profemora and protibiæ piceous.

Head: clypeus very convex, front margin truncate and bordered at middle, lateral teeth moderately advanced and rounded, clypeal suture and facial sulci both deep, sides very uneven. *Prothorax* globose, but widest rather behind middle, a fourth wider than head and a little wider than long, border entire to hind lateral pore; median line fine, joining transverse impression in front, the impression fairly deep and impunctate. *Elytra* oval, shoulders nearly rounded away, a fourth wider than prothorax, and a half longer than wide, base unbordered, very shiny, with a disconnected pore on each side; striæ rather shallow, punctate, evanescent on apical fourth, 1 entire, but shallower behind, 8 formed by minute pores, interrupted at apical third, deep near apex, two apical and two poorly-defined posthumeral pores; intervals rather flat, 1 slightly raised, 3 with three pores on the interval at about a fifth, a half, and three-quarters. *Legs*: protibiæ with the spines very little

developed, apical digitation slightly curved and a little longer than spur.

Length, 3 mm.

CEYLON: Kandy (*G. Lewis*).

Type in the British Museum. This is the only example I have seen.

234. **Dyschirius constrictus**, sp. nov.

Colour dark brassy: palpi, joints 1 to 3 of antennæ (rest fuscous), and two hind pairs of legs ferruginous; front legs and apex of elytra (narrowly) more or less brown.

Head: clypeus convex, uneven and somewhat depressed in front, margin subarcuate, lateral teeth rather blunt and very little advanced, connected with front by a median ridge, on each side of which is an uneven rounded depression occupying the position of the clypeal suture, a short, transverse, often asymmetrical furrow across vertex, and a deeper, rather longer one behind it across neck, facial sulci deep, diverging behind and ending in a punctate area behind eye, the punctures extending a little inwards on to neck, surface very uneven at sides. *Prothorax* globose, a third wider than head, but hardly wider than long, border entire to hind lateral pore; median line very fine, transverse impression moderately deep, subcrenulate. *Elytra* ovate, shoulders square, base unbordered, a fifth wider than prothorax and a half longer than wide; striæ punctate and moderately deep to apical third, then gradually disappearing, but sometimes just visible to near apex, 1 entire, arising in basal pore, the other striæ shortening a little outwards, 8 generally reduced to two or three pores near base, deep close to apex, two apical and three posthumeral pores; intervals moderately convex, 1 raised, 3 with three pores on the interval. *Legs*: protibiæ with upper spine obsolete, lower one short but sharp, apical digitation nearly straight, longer than the spur.

Length, 2·3–2·7 mm.

ASSAM: Shillong (*F W Champion*). BENGAL: Sardah (*F W Champion*). BIHAR: Purnea district, Kierpur (*C. Paiva*—Ind. Mus.), "at light." UNITED PROVINCES: Kumaon, West Bhatkot, 4000 feet (*H. G. Champion*); Dehra Dun, Lachiwala (*M. Cameron*—Forest Res. Inst.).

Type in the British Museum.

235. **Dyschirius tamil**, sp. nov.

Colour dark brassy: palpi, joints 1 to 3 of antennæ, and two hind pairs of legs ferruginous; rest of antennæ, protibiæ, and apical border of elytra brown; profemora piceous.

Head: clypeus convex, front margin truncate, bordered, the small lateral teeth concave and fairly sharp, gradually narrowing to a median longitudinal carina, connecting it with front, a depression on each side of the carina, representing the clypeal suture, and behind it two or three short transverse impressions, one behind the other, facial sulci deep, diverging behind, the whole of neck punctate, but only lightly at middle, surface very uneven at sides. *Prothorax* globose, not quite a half wider than head, hardly wider than long, border entire to hind lateral pore; median line very fine, transverse impression fairly deep, subcrenulate. *Elytra* oval, shoulders distinct though somewhat rounded, base unbordered, a fourth wider than prothorax, two-thirds longer than wide; striæ not very deep but distinctly punctate, evanescent though generally traceable near apex, 1 arising in a basal pore, hardly deeper than the other striæ, which, where impressed, shorten outwards, 7 distinctly shorter than inner striæ, 8 represented by a few very fine punctures in front, deep behind, one apical and three posthumeral pores; intervals rather flat, 1 hardly raised, 3 with three pores on the interval. *Legs*: protibiæ with spines very slightly developed, apical digitation straight, not longer than spur.

Length, 2·9–3·25 mm.

MADRAS: Ganjam district, Lake Chilka, Barkuda Island (*N. Annandale*—Ind. Mus.) " at light "; Madras (*Tomlin*, also *F. H. Gravely*—Madras Mus.); Vizagapatam district, Chipurupalli (*R. S. Patuck*—Brit. Mus.).

Type in the British Museum.

236. **Dyschirius mitodes**, sp. nov.

Colour piceous, elytra with a faint æneous tinge; palpi, antennæ, apical border of elytra, and legs more or less ferruginous.

Head: clypeus convex, with a slight central depression behind, front margin truncate and strongly bordered, lateral teeth well advanced but not very sharp, clypeal suture not very deep, joining the much deeper facial sulci to form a curved impression, ending on each side behind eye, surface microscopically and sparsely punctate, sides less uneven than usual. *Prothorax* subcylindrical, somewhat contracted in front and widest at a third from base, a third wider than head and an eighth longer than wide, sides very faintly rounded, finely bordered to hind lateral pore, the border continuing as a very fine line to basal sulcus; median line and transverse impression both fine but distinct. *Elytra* cylindrical, shoulders square, base without umbilicate pore or tubercles, basal border fine but entire, hardly wider than prothorax, a little more than

twice as long as wide; striæ fairly deep and moderately punctate on basal half, more finely behind, 1 to 3 reaching apex (or nearly so), 4 to 7 somewhat shorter, 8 very fine, not reaching base, hardly interrupted behind, deep at apex, two apical and three posthumeral pores; intervals slightly convex, 1 not raised, 3 with three large pores, adjoining stria 3. *Legs*: protibiæ with upper spine small, lower one moderately developed, apical digitation curving a little downwards, longer than spur.

Length, 3·3 mm.

United Provinces: Fyzabad (*R. W G. Hingston*).

Type in the British Museum.

The type is unique. The species is noteworthy for the fine extension of the prothoracic border between the hind lateral pore and the basal sulcus.

237 **Dyschirius ladakensis**, sp. nov.

Colour black, elytra brassy on apical half; palpi, antennæ, and legs piceous.

Head: clypeus convex, subtriangular but truncated behind, front margin truncate and finely bordered in middle, lateral teeth moderately prominent and rounded, clypeal suture not very deep, subinterrupted at middle, facial sulci fairly deep, one or two oblique striæ on each side of vertex near eye, surface a little dull, but without any evident microsculpture. *Prothorax* subglobose, but contracted and gently rounded in front, widest at basal third, a third wider than head, as long as wide, border extending to hind lateral pore; median line moderately impressed, a little deeper near apex, passing through the transverse impression without joining it, and not quite reaching front margin, the impression not very deep, subcrenulate, surface slightly dull, like that of head. *Elytra* with parallel sides, shoulders square, base unbordered, very shiny and without pores, nearly a third wider than prothorax, rather less than twice as long as wide; striæ moderately impressed, but not any shallower towards apex, finely punctate, the punctures disappearing on apical third, 1 only reaching base, a little deeper than the rest, 7 and 8 both interrupted behind, 8 very fine, but deep close to apex, one apical pore, one posthumeral pore just behind shoulder and two other feebly-developed ones lower down; intervals moderately convex, 1 somewhat raised, 3 with three pores on the interval. *Legs*: protibiæ with spines poorly developed, apical digitation blunt, as long as spur.

Length, 3 mm.

Ladak (*G. Babault*).

Type in my collection. The type is unique.

238. **Dyschirius bifrons**, sp. nov.

Colour brassy: palpi, joints 1 to 3 of antennæ, apical border of elytra, and legs (except profemora) ferruginous; profemora and rest of antennæ piceous.

Head: clypeus convex, with a short transverse ridge behind, the ends of which are tuberculiform, median part in front a little advanced and with an emargination at middle, lateral teeth rather sharp and also somewhat advanced, their upper surface concave, the transverse ridge connected with a convex area on front by a fine carina, which extends back a little beyond the area, and has a small though deep depression on each side of it, the depressions joining facial sulci, which are deep behind but widen out and become shallower in front, their surface uneven. *Prothorax* globose, about a third wider than head, hardly wider than long, border not reaching hind lateral pore; median line exceptionally deep, deeper and wider on disk, transverse impression fairly deep, subpunctate. *Elytra* rather narrow, sides nearly parallel, shoulders square, base unbordered, about a fifth wider than prothorax, three-fourths longer than wide; striæ punctate and moderately deep on basal half, shallower behind, 1 arising in basal pore and deeper than the rest, 1, 2, and 7 reaching apex, 8 finer than the others, obsolete for a short distance at apical third, deep behind, two apical and three posthumeral pores, the second and third posthumerals considerably behind the first; intervals moderately convex, 1 raised, 3 with three pores adjoining stria 3. *Legs*: protibiæ with the spines well developed though blunt, apical digitation curving a little downwards, longer than the spur.

Length, 2·8 mm.

UNITED PROVINCES: Kumaon, River Sarda Gorge (*H. G. Champion*).

Type in the British Museum.

239. **Dyschirius disjunctus**, sp. nov.

Colour brassy: palpi, joints 1 and 2 of antennæ, and two hind pairs of legs testaceous; rest of antennæ, front legs, and apical border of elytra more or less brown.

Head: clypeus rather wide and convex behind, its front margin arcuate, bordered, lateral teeth rounded and very little advanced, clypeal suture and facial sulci deep, uniting to form a curved impression, surface somewhat uneven at sides. *Prothorax* globose, but strongly contracted in front and widest at basal third, about a third wider than head, as long as wide, border extending from front angle to front lateral pore only; median line very fine, transverse impression moderately deep, impunctate. *Elytra* short ovate, with square shoulders, base

very smooth, unbordered, a fourth wider than prothorax, and only a little more than a half longer than wide, widest at about middle, a large pore on each side at base, which is only sometimes and then imperfectly connected with stria 1; striæ punctate and deep on basal two-thirds, discal striæ rather shallower on apical third, where the punctures disappear, none quite reaching base, 1, 2, and 7 reaching apex, 3 joining 6, 4 and 5 free behind and somewhat shorter, 8 just traceable in front, deep on apical third, two apical and three posthumeral pores; intervals convex, 1 raised, 3 with two pores on the interval, the front one at a sixth and near stria 3, the hind one at a half and near stria 2, so that it is apparently the hindmost of the usual three pores which has disappeared. *Legs*: protibiæ with the spines very slight, apical digitation curved downwards, barely longer than the spur.

Length, 3·5–4 mm.

BENGAL: Sardah (*F W Champion*). UNITED PROVINCES: Haldwani and West Almora (*H. G. Champion*).

Type in the British Museum.

240. **Dyschirius porosus**, *Putz.*

Dyschirius porosus, Putzeys *, Compt. rend. Soc. Ent. Belg. 1877, p. 40; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

Colour: head and prothorax dark brown with brassy reflections, the prothorax paler along front and hind margins; palpi, antennæ, legs, and elytra more or less ferruginous, the elytra with a faint V-shaped dark marking across base and an equally faint dark transverse band behind middle.

Head: clypeus somewhat concave in front, triangular, with an obtuse angle pointed backwards, the front margin, which forms the base of the triangle, a little arcuate, lateral teeth advanced, sides forming slight ridges, which meet in a peak on middle of front, from which a very short sharp carina runs a little way backwards, two other ridges running obliquely forwards from mid-eye level, one on each side, and meeting the first-mentioned ridges at the peak, between which and the frontal plates is a deep rounded depression on each side ending in front in a groove, which separates the frontal plates and clypeus, facial sulci deep behind, divergent, shallower in front, and meeting at the peak, labial palpi small and slender, last joint of maxillaries strongly dilated, but produced and pointed at apex. *Prothorax* globose, a half wider than head, but very nearly as long as wide, lateral border obsolete; median line just traceable near base, transverse impression wanting, surface fairly closely punctate, except along base, which is smooth. *Elytra* ovate, base unbordered, shoulders evident, a third wider than prothorax and a half longer than

wide, widest behind middle ; striæ not deep and formed chiefly by punctures, which become small and evanescent towards apex, 1 arising in a very small basal pore and up to a fifth from base running very close to suture, deep on disk, 5, 6, and 7 approaching each other and sometimes joining behind, 8 moderately impressed behind, running forward and disappearing without quite joining marginal channel at a fourth from apex, a single large apical pore, marginal channel deep

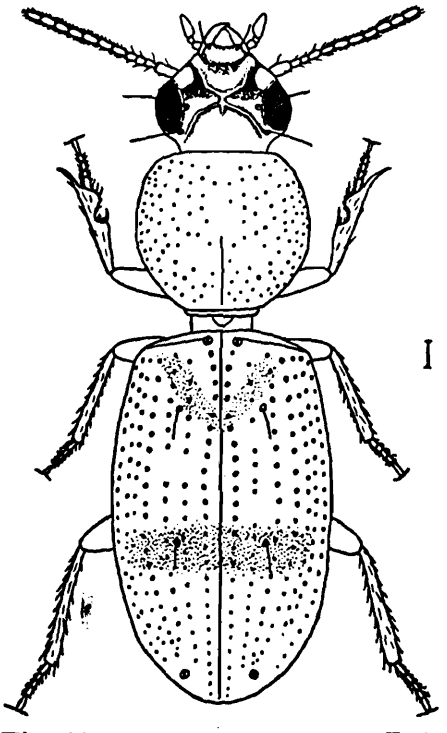


Fig. 61.—*Dyschirius porosus*, Putz.

except quite close to apex, with three posthumeral pores ; intervals convex on disk only, otherwise nearly flat, 1 raised on disk, 3 with two pores on the interval near base and just behind middle. *Legs* : protibiæ with spines nearly obsolete, the apical digitation long and sharp, curving downwards and outwards, longer than the spur.

Length, 1·95 mm.

Burma (*J. W Helfer*).

Type in the Stettin Museum.

The species was described on four specimens sent by Dohrn to Putzeys, who seems to have retained one example and returned two ; the fourth example has disappeared. Putzeys' specimen is now in the Brussels Museum, but is without a head, as is the second example in the Stettin Museum. There remains, therefore, only one specimen in a moderate state of preservation. The unusual characters detailed above indicate that a new genus will probably be required here, but the exiguous material available does not

allow of any thorough examination of generic characters, so that for the present the species is left in this genus, where Putzeys placed it.

Three further notes on the genus are required :—

(1) Among the specimens of *Dyschirius* sent by Dohrn to Putzeys were three unique examples of different species, all of which were named and described. Presumably they were returned by Putzeys, but, in any case, none of them is now to be found, either in the Stettin Museum or in the Brussels Museum, and for the present, at all events, all must be treated as lost. I have not been able to identify any of them while dealing with the considerable material I have examined, but they may yet be rediscovered, and consequently I append translations of Putzeys' descriptions :—

" *Dyschirius fusus*, Putzeys, Compt. rend. Soc. Ent. Belg. 1878, p. 172.

" Long. $3\frac{1}{2}$, el. 2, lat. $\frac{3}{4}$ mill.

" Æneo-piceous, clypeus bordered, undulate, with sharp angles, front elevation transverse, separated from the vertex by a deep sulcus. Prothorax oblong, hardly narrowed either in front or behind, sides subparallel, front margin truncate, angles rounded, median sulcus fine, somewhat deep in front, but not reaching margin, front transverse impression deep, formed by punctures, abbreviated on each side. Elytra a little wider than prothorax, elongate, gently narrowed from base to apex, striæ entire, coarsely punctate, sutural stria joined to prescutellary pore, marginal stria not extending beyond shoulder, interval 3 tripunctate. Protibiæ externally tridentate, outer digitation slightly curved, equal to spur.

" Very near *D. cylindricus*, but redder, and much smaller ; the prothorax is less contracted in front, the marginal stria of the elytra does not extend beyond shoulder, and the prescutellary pore is not isolated.

" Calcutta, 1 ex. (coll. Dohrn)."

" *Dyschirius binodosus*, Putzeys, Compt. rend. Soc. Ent. Belg. 1878, p. 173.

" Long. 2, el. $1\frac{1}{4}$, lat. $\frac{3}{4}$ mill.

" Piceo-æneous, palpi and legs testaceous. (Antennæ wanting.)

"Clypeus bordered, truncate, angles divergent, front elevation cordate behind, nodulous, vertex with a similar nodule. Prothorax shortly globose, with a distinct longitudinal sulcus. Elytra subcylindrical, base rounded and smooth, shoulders with a reflexed tooth, striæ deep, coarsely punctate, smooth near apex, striæ 1 and 2 evident, marginal stria extending beyond shoulder, sutural stria connected with prescutellary

pore. Protibiæ externally dentate, and furnished with an upper denticulation.

" Calcutta 1 ex. (coll. Dohrn)."

" *Dyschirius rugifer*, Putzeys, Compt. rend. Soc. Ent. Belg. 1878, p. 173.

" Long. 2, el. 1, lat. mill.

" Black-æneous, palpi, base of antennæ, and legs testaceous.

" Clypeus narrowly bordered, truncate, angles prominent. Front elevation cordate, narrowly prolonged, rugulose, vertex impressed in middle and with some coarse irregular rugæ. Prothorax globose, median sulcus hardly visible. Elytra half as wide again as prothorax, ovate, base smooth, punctate-striate, striæ smoother at apex, interval 3 tripunctate, stria 1 arising in a prescutellary pore. Protibiæ externally bidenticulate.

" Calcutta 1 ex. (coll. Dohrn)."

(2) *Phreoryctes pusillus*, Schmidt-Goebel, Faun. Col. Birm. 1846, t. 3. f. 6 ; Putzeys, Compt. rend. Soc. Ent. Belg., 1878, p.174 ; Andrewes, Trans. Ent. Soc. Lond. 1923, p. 59 ; id., Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.
Dyschirius debilis, Putzeys, Rév. Gén. des Clivinides, Ann. Soc. Ent. Belg. x. 1867, p. 97 ; Bouchard, Ann. Soc. Ent. Fr. 1903, p. 170.

A species of *Dyschirius* was figured in Schmidt-Goebel's work ; the name appeared on the back of the cover of the only part which appeared, but the species was not described.

In the ' Révision ' Putzeys writes : " Mr. Schmidt-Goebel proposed to establish under the name of *Phreoryctes* a genus of which he figured the characters in pl. iii (fig. 6) of his *Faun. Birman.* But, according to a note in his handwriting on the cover of the first part of the work, he recognized that this genus was not sufficiently distinct from *Dyschirius*, and he designated, under the name of *Dyschirius debilis*, the insect figured as *Phreoryctes pusillus*." Later on Putzeys identified the species, as he thought, with his own *Dyschirius interpunctatus* (included in this work under the genus *Trilophus*). It is not possible to express any opinion about Bouchard's identification, as his collection has disappeared, but neither he nor Putzeys could have had more than the original figure to assist them.

When examining the Helfer collection, now in the Prague Museum, I could find no example of the genus *Dyschirius*, and there seems now to be no possibility of deciding what the species is.

(3) *Dyschirius ordinatus*, Bates, Scientific Results of the Second Yarkand Mission, Col. 1891, p. 9 ; Andrewes, Ann. Mag. Nat. Hist. (9) xvii, 1926, p. 378.

In his paper on the Carabidæ taken by Dr. Stoliczka during

this expedition, Bates identified a specimen taken in the Pamir, between Sirikol and Panga, with the words "I see no definite character to separate this small species from *D. ordinatus*, hitherto known only from Japan" (see Bates, Trans. Ent. Soc. Lond. 1873, p. 240, for a description of this species).

This identification seems to be inaccurate, but the specimen in question, now in the Indian Museum at Calcutta, has no head, so that the question must remain in abeyance until further material from the Pamir is available, when it may be possible to settle it.

Subgroup VII. *ZELMIDES.*

The subgroup is formed for the aberrant genus Zelma, of which only one specimen and fragments of another are at present known.

Genus **ZELMA.**

Zelma, Andrewes, Ann. Mag. Nat. Hist. (9) v, 1920, p. 451.

Form oval, and superficially more like a Tenebrionid (*e.g.* a small *Opatrum*) than a Carabid. Body winged. *Head* flat, semicircular, widest at base, which is emarginate in the middle to receive a projection of the prothorax, margin uneven and more or less serrate, bisinuate at sides, with deep frontal impressions, clypeal suture wanting; eyes practically invisible from above, coarsely faceted, sunk in sides of head, while between them and buccal fissure (which is represented by a fine groove up to the insertion of antennæ) intervene first a deep groove for the reception of the first four joints of the antennæ, and then a pitted space of about equal width, corresponding with the paragenæ; labrum very short, the front margin arcuate, sexsetose, ciliate at sides; mandibles without seta in the scrobe, short, slightly curved, sharply pointed, with a rough inner edge; mentum finely rugose, a little wider than long, moderately emarginate and edentate, epilobes very wide, the ridge separating them from the lobes extending to the basal suture, two large pores near base of central part, which (viewed from below) is depressed, lobes pointed, more or less bordered, slightly rounded at sides, apex very obliquely truncate, surface pitted; ligula very small, narrow, and glabrous, concealed behind the supports of the labial palpi, paraglossæ invisible; maxillæ short, apex slender and glabrous, hooked, inner margin densely ciliate; palpi very short and more or less hidden, maxillaries glabrous, joint 4 three times as long as 3, tapering almost from base to apex, labials with joint 3 inflated at base and tapering sharply to apex, a little longer

than 2, which is bisetose ; antennæ arising beneath a frontal plate and not quite reaching base of prothorax, moniliform, joint 1 stout and a little longer than 2, 3, 4, and 11, which are about equal, the remainder about two-thirds as long, pubescent from joint 2, but only densely from near the base of 4. *Prothorax* strongly transverse, quadrate, pedunculate, central part longitudinally raised, projecting in front into an indentation of head, the base emarginate and bituberculate above peduncle ; sides explanate and hollowed out, three or four large, transverse, shallow pits arranged longitudinally along them, bounded inwardly by a fine ridge ; scutellum very small, on the peduncle. *Elytra* tricarinate, base truncate, emarginate in middle, with small projections on each side of the emargination, resulting from extensions of the first carina, shoulders sharply rectangular, apex slightly truncate, the sutural angles just showing as a faint projection, outer carina forming the apparent margin, the real margin inflexed and invisible from above, separated from it by a shallow channel. *Underside* deeply pitted ; the propleura wide in front, narrowed behind, undulating in correspondence with the transverse pits on upper surface ; intercoxal process bordered, narrowed between coxæ, widened out behind, the apex minutely setulose, the border continued obliquely forward on each side in front across the prosternum, which is finely carinate down the central line ; a deep bordered sulcus between propleura and prosternum for the reception of the antennæ, episterna shagreened and forming (as seen from beneath) the floor of the antennal channel in front, but visible behind, where the channel widens out ; metasternum sulcate, the episterna long, narrow, and sulcate behind ; margins of ventral segments curving backwards at sides, 4 and 5 each with a deep, pitted transverse sulcus, 6 with a setiferous pore at margin on each side. *Legs* short ; profemora dilated, sulcate beneath, protibiæ with two inconspicuous teeth above terminal one, tarsi minute, joint 1 as long as the rest together ; mesofemora sulcate beneath, with a tooth near base, mesotibiæ slender, finely spinose, without trace of spur ; hind coxæ contiguous ; claws minute.

The usual setæ to be seen on various parts of the body in the Carabidæ are almost entirely wanting, with the exception of those on the labrum, last segment of ventral surface, and legs, but the cleansing of the specimens is probably to some extent responsible for this.

The remarkable feature in this genus is the presence of antennal grooves on the underside, not only of the head, but also of the prothorax. In the *Pseudomorphini* there are grooves on the underside of the head for the reception of the antennæ, and in some Scaritini there is a shallow groove, between eye and buccal fissure, for the scape only. I know of no other

instance in the Carabidæ of such grooves on the prothorax as well as on the head. There seems to be a relationship between this genus and *Solenogenys*, described by Westwood (Trans. Ent. Soc. Lond. 1859, p. 170) for *S. fœda*, a species taken by Bates on the Amazon, but they differ in many important characters.

241. **Zelma miranda**, *Andr.*

Zelma miranda, Andrewes, Ann. Mag. Nat. Hist. (9) v, 1920, p. 453.

Many of the characters of the species, the only one known at present, have already been given in the course of the generic description. As some of the measurements originally given were erroneous, I correct and amplify them below.

Colour grey, the upper surface covered with a minute, sparse, and almost invisible pubescence; underside piceous red, the legs a little lighter.

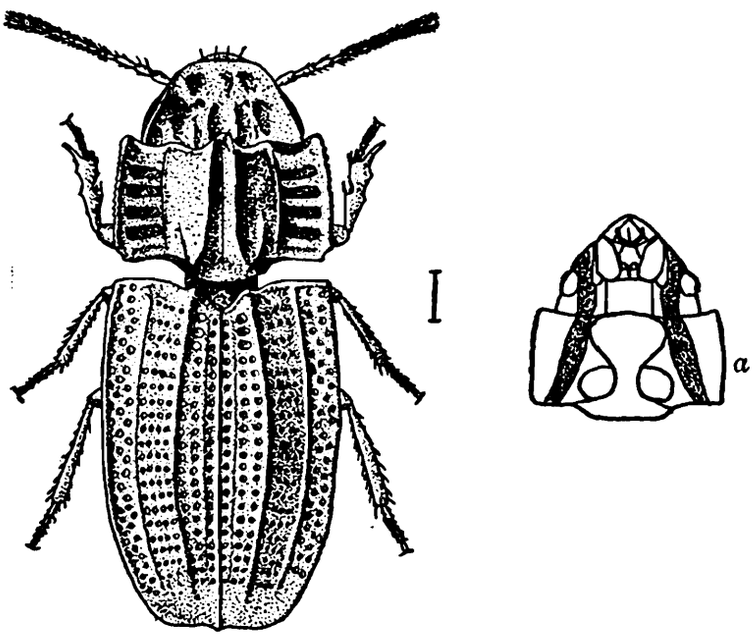


Fig. 62.—*Zelma miranda*, Andr.
(*a*) Underside of head and prothorax, to show the antennal grooves.

Head (0·86 × 1·05 mm.) coarsely sculptured, surface uneven, two small tubercles on middle of front. *Prothorax* (0·86 × 1·3 mm.) with the sides almost parallel, a row of small tubercles along the margin, front angles advanced, hind angles obliquely truncate; median line deep and widened out behind into the basal emargination, surface uneven and minutely tuberculate. *Elytra* (2·28 × 1·4 mm.) slightly convex, sides parallel, the carinæ minutely tuberculate (more finely so than the margin of the prothorax); three irregular rows of shallow punctures

between sutural interval and first carina, four between first and second carinæ, the punctures larger towards margin, also larger and quite irregular between second and third carinæ.

Length, 4 mm.

BURMA: Tharrawaddy (*G. Q. Corbett*). BENGAL: Calcutta, Eden Gardens, " at light " (*F. H. Gravely*—Ind. Mus.).

Type in my collection. The Calcutta example is fragmentary, but shows a good many of the characters; it is a little smaller than the type.

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All names printed in italics are synonyms.
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Lymantria obfuscata, 56.

Monolepta signata, 32.

Nephantis serinopa, 33.

Odontotermes obesus, 24.

Pieris brassicæ, 32.
Platypodidæ, 33.
Plusia, 62.
Polytela gloriosæ, 32.
Prodenia litura, 32.
Pyrausta machæralis, 33.

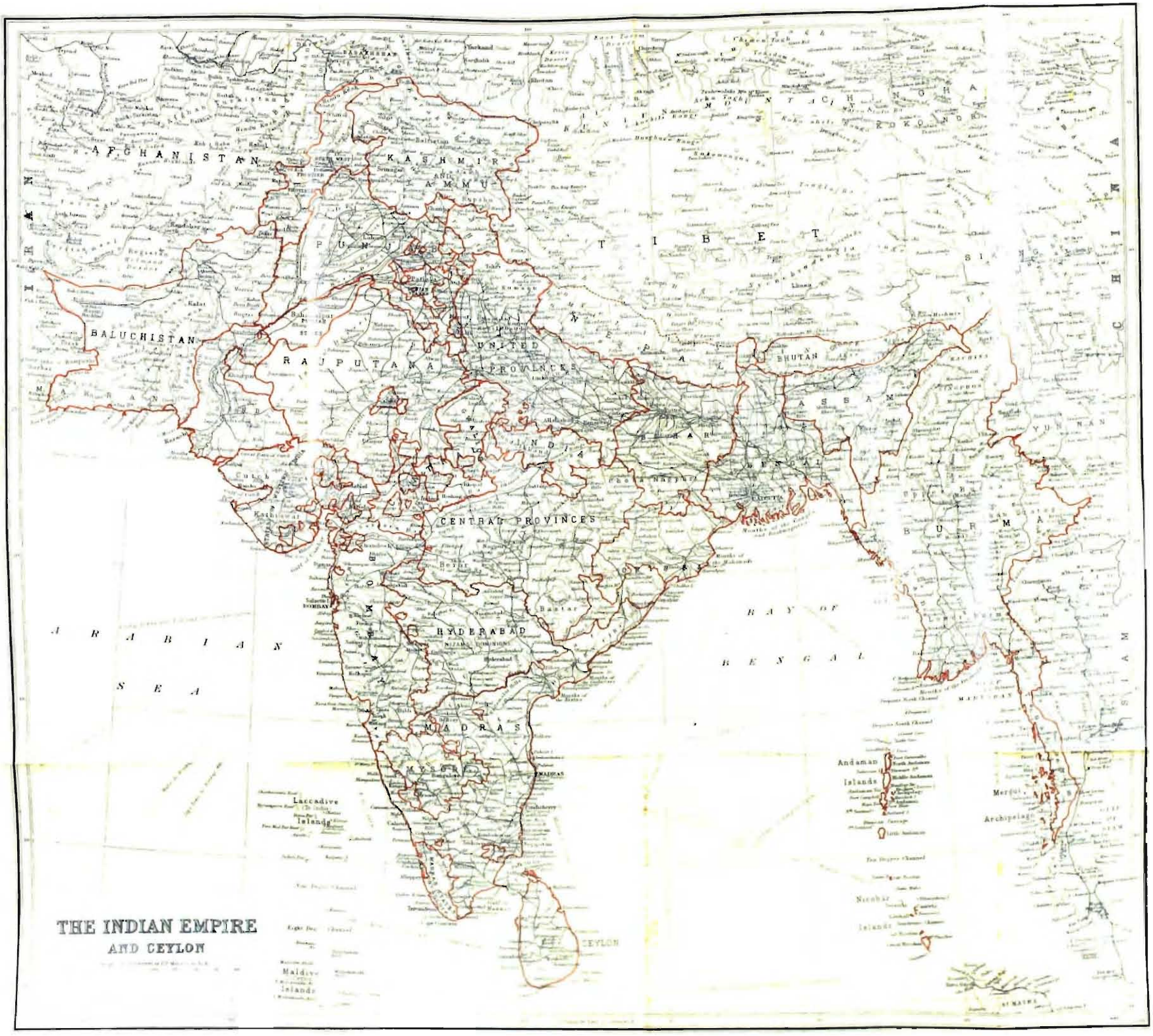
Remigia, 62.

Stictaspis ceratitina, 32.
Sylepta derogata, 33.

Termes redemanni, 24.
Thermesia, 62.

Utetheisa pulchella, 31, 32.

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THE INDIAN EMPIRE
AND CEYLON

EXPLANATION OF PLATE II.

Fig. 1. *Omophron vittatus*, Wied. × $5\frac{1}{2}$.
2. „ *pictus*, Wied. × $5\frac{3}{4}$.
3. *Scapterus crenatus*, F. × $4\frac{1}{2}$.

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EXPLANATION OF PLATE III.

Fig. 1. *Leïstus indus*, Tchitch. × 5.
2. *Omophron porosus*, Chaud. × 6.
3. „ *interruptus*, Chaud. × 6.
4. „ *guttatus*, Chaud. × $6\frac{1}{2}$.
5. „ *lunatus*, Bänn. × 6.
6. „ *testudo*, Andr. × $6\frac{2}{3}$.

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B. H. Crawford, photog.

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EXPLANATION OF PLATE IV.

Fig. 1. *Omophron affinis*, Bänn. × 6.
2. „ *striaticeps*, Gestro. × $6\frac{1}{2}$.
3. „ *maculosus*, Chaud. × $7\frac{1}{2}$.
4. „ *smaragdus*, Andr. × $5\frac{1}{2}$.
5. „ *virens*, Andr. × 6.
6. „ *oberthüri*, Gestro. × 10.

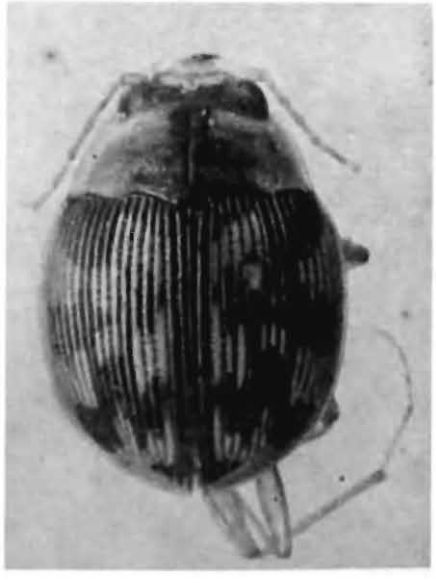
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B. H. Crawford, photog.

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EXPLANATION OF PLATE V.

Fig. 1. *Omophron gemmeus*, Andr. × 8.
2. „ *bicolor*, Andr. × $7\frac{1}{2}$.
3. „ *axillaris*, Chaud. × $7\frac{1}{3}$.
4. „ *rotundatus*, Chaud. × $7\frac{1}{3}$.
5. *Siagona cyathodera*, Andr. × 2.
6. „ *polita*, Andr. × $2\frac{1}{2}$.

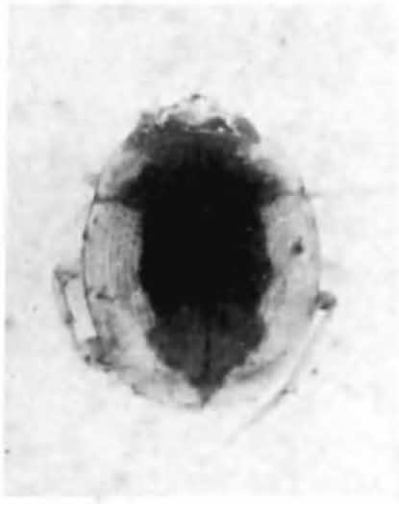
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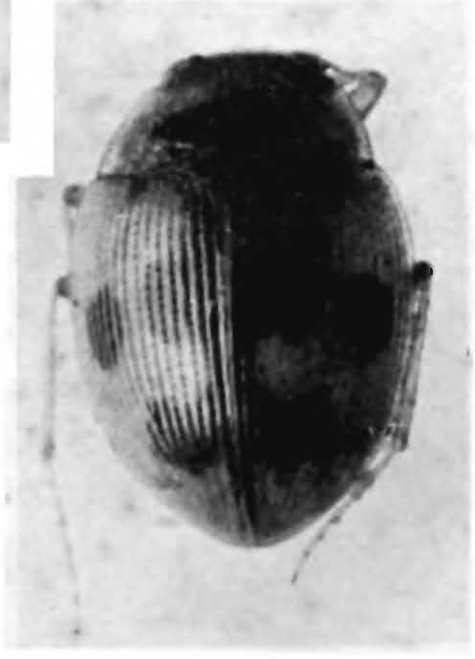
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EXPLANATION OF PLATE VI.

Fig. 1. *Siagona kulla*, Andr. × $5\frac{1}{4}$.
2. ,, *pumila*, Andr. × 5.
3. ,, *angustipennis*, Bates. × 5.
4. *Coptolobus glabriculus*, Chaud. × 4.
5. *Gnaphon costatus*, Andr. × $2\frac{3}{4}$
6. ,, *loyolæ*, Fairm. × $2\frac{1}{2}$.



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EXPLANATION OF PLATE VII.

Fig. 1. *Oxylobus mahratta*, Andr. × $2\frac{1}{2}$.
2. „ *meridionalis*, Bates. × $2\frac{1}{2}$.
3. „ *dekkanus*, Andr. × $2\frac{1}{4}$.
4. „ *follis*, Andr. × $2\frac{1}{4}$.
5. „ *inæqualis*, Andr. × $2\frac{3}{4}$.
6. „ *alternans*, Andr. × $2\frac{1}{2}$.

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EXPLANATION OF PLATE VIII.

Fig. 1. *Oxylobus porcatus*, F. × 3.

2. „ „ var. *obliteratus*, Andr. × $2\frac{3}{4}$.

3. „ *alveolatus*, Chaud. × $2\frac{1}{2}$.

4. „ *foveiger*, Chaud. × $2\frac{1}{2}$.

5. „ *rugiceps*, Andr. × $2\frac{1}{2}$.

6. „ *asperulus*, Chaud., ♂. × $2\frac{1}{2}$.

7. „ *quadricollis*, Chaud., ♀. × $2\frac{1}{2}$.

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EXPLANATION OF PLATE IX.

Fig. 1. *Oxylobus montanus*, Andr. × $2\frac{1}{2}$.
2. „ *lateralis*, Dej. × $2\frac{1}{2}$.
3. *Scapterus sulcatus*, Putz. × $3\frac{3}{4}$.
4. „ *stevensi*, Andr. × 2.
5. *Oxygnathus aboranus*, Andr. (ex mandibles). × $4\frac{1}{4}$.
6. *Sparostes striatulus*, Putz. × 3.



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