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PYCNOGONIDA OF THE INDIAN MUSEUM.

By W. T. CALMAN, D.Sc., F.R.S., Deputy Keeper of Zoology in the British Museum (Natural History).

The collection described in this paper was entrusted to me for examination by the Director of the Zoological Survey of India, to whom my thanks are due, not only for the opportunity of studying these very interesting specimens but also for permission to retain, for the British Museum, such duplicates as were available.

With one or two exceptions, the specimens were collected on or near the coasts of British India. The only previous records of Pycnogonida from this region will be found in the writings of Wood-Mason (1873), Wood-Mason and Alcock (1891), and Carpenter (1904 and 1907), enumerated in the list of references at the end of this paper.

Seventeen species have been recognized, of which ten are described as new. There are also specimens which may represent some five additional species but they are too imperfect for exact description and are therefore recorded only under generic names. Where it has been necessary to refer to specimens in the British Museum collection, particulars of them are given in the lists of localities but are distinguished by being enclosed in square brackets.

Among the points of more general interest resulting from the study of this collection, attention may be called to the reduction of the typically tubular arthropodan exoskeleton to a framework of rods in *Pal-lenopsis* (*Rigona*) *alcocki*; to the curious and unexplained papillae on the proboscis of *Anoplodactylus investigatoris*; and to the numerous secondary diverticula of the digestive caeca in *Endeis flaccidus*.

The high proportion of new species is evidence of the imperfection of our knowledge of the tropical littoral Pycnogonida. Like many of the smaller inhabitants of the sea-bottom, the Pycnogonida are rarely to be obtained in bulk, and the laborious selection of single specimens is seldom undertaken except when the collecting is done by a specialist.

The difficulty of defining species in certain genera of Pycnogonida, to which I have elsewhere alluded (1915, p. 6), is illustrated especially by the specimens of *Ascorhynchus* and *Endeis* in this collection. In the former genus, the scantiness of the material gave an excuse for postponing consideration of the problem; in the case of *Endeis* I am far from confident in the permanence of the grouping adopted. It is offered merely as a product of "museum taxonomy" (cf. Annandale, *Museums Journ.* XXI, 1922, p. 143) to be overturned perhaps, by the first observer who can study the living animals in the field. The importance of oecological observation as an aid to taxonomy, which has been strongly urged by the Director of the Zoological Survey of India, surely needs no further argument. In the case of marine animals, however, more especially if they come from much below the littoral level, the difficulties of observation forbid the hope of much help in the immediate future; meanwhile, we must do the best we can with our museum material.

LIST OF SPECIES.

Family Colossendeidae

Colossendeis colossea Wilson.,, *macerrima* Wilson.*Rhopalorhynchus kroyeri* Wood-Mason.

Family Eurycydidae.

Ascorhynchus latus, sp. nov.

,, sp.

,, sp.

,, sp.

Family Nymphonidae.

Nymphon andamanense, sp. nov.

Family Phoxichilidae (Pallenidae, auctt.).

Pallene pectinata, sp. nov.

,, sp.

Parapallene kempi, sp. nov.,, *hospitalis* Loman.

Family Phoxichilidiidae.

Pallenopsis annandalei, sp. nov.,, (*Rigona*) *alcocki*, sp. nov.,, ,, *ovalis*, Loman.*Anoplodactylus cribellatus*, sp. nov.,, *saxatilis*, sp. nov.,, *investigatoris*, sp. nov.

,, sp.

Family Endeidae (Phoxichilidae, auctt.).

Endeis meridionalis (Böhm).,, *mollis* (Carpenter).,, *flaccidus*, sp. nov.**Colossendeis colossea** Wilson.*Colossendeis colossea*, Wilson, 1881, p. 244, pls. i & iii; Bouvier, 1917, p. 13, pl. i, fig. 2, pl. ii, fig. 1 (with synonymy).*C. gigas*, Hoek, 1881, p. 61, pl. viii, figs. 1, 2, pl. x, figs. 1, 5; Wood-Mason and Alcock, 1891, p. 17; Loman, 1908, p. 21.*Locality*.—"Andaman Sea, Lat. 13° 21' N., Long. 93° 27' E., 922 fathoms. Marine Survey, Stat. 114." 1 ♂*Remarks*.—The specimen was identified by Wood-Mason and Alcock, who describe its phosphorescence (*l. c.*). It measures 50 mm. in total length and the third left leg measures 235 mm. The minute genital pores are visible on the last two pairs of legs. The label states that the colour in life was "red, with the ventral surface of the legs whitish."

In enumerating the occurrences of this species Bouvier has omitted Wood-Mason and Alcock's record and also that from the "Siboga" Expedition of a specimen from 1788 metres depth between the Kei and Aru Islands. Although known to range from Greenland to the Crozet Islands and from Japan to Nova Scotia, it does not appear to have been recorded (except for this specimen) from the tropical Indian Ocean.

Colossendeis macerrima Wilson.

Colossendeis macerrima, Wilson, 1881, p. 246, pls. i, fig. 2, iii, figs. 9—12, v, fig. 32; Bouvier, 1917, p. 10, pls. i, fig. 1, iii, figs. 1 and 2 (with synonymy).
C. leptorhynchus, Hoek, 1881, p. 64, pl. viii, figs. 3—7; Loman, 1908, p. 21.

Localities.—"Arabian Sea, 636 fathoms. Marine Survey." 1 sp.

"Laccadive Sea, Lat. 7° 5' 45" N., Long. 75° 4' E., 719 fathoms. Marine Survey, Stat. 150." 1 sp.

"Andaman Sea, Lat. 11° 46' 30" N., Long. 93° 16' E., 569 fathoms. Marine Survey, Stat. 331." 1 sp.

"Andamans, 7½ miles E. of N. Cinque I., 490 fathoms. Marine Survey." 1 sp.

"Andaman Sea, Lat. 13° 21' N., Long. 93° 27' E., 922 fathoms. Marine Survey, Stat. 114." 1 sp.

Remarks.—All the specimens (which appear to be males) come within the limits of the definition given by Bouvier for this species. They fall into two groups coming from distinct geographical areas and differing from each other as follows:—

Group I. Tip of proboscis distinctly more slender than the base. As in the typical *C. macerrima* the fourth segment of the palp (usually reckoned as the fifth) is longer by about two-thirds than the second (third) segment. Arabian Sea, 636—719 fathoms. (First two specimens enumerated above).

Group II. Tip of proboscis (as in the typical *C. macerrima*) equal in diameter to the base or slightly stouter. Fourth segment of palp more than twice as long as the second. Andaman Sea, 490—922 fathoms. (Specimens 3, 4 and 5 above).

The number of specimens is obviously inadequate to establish the geographical range of the two forms, but it may be noted that *C. gardineri* Carpenter, which agrees, except for its smaller size and shorter proboscis, with the specimens of group I, comes from a locality (Saya de Malha) which, although distant, is nearer to that of the first group than to that of the second.

No differences of any magnitude, other than those mentioned, can be established between the two groups, which are thus seen to divide between them the chief characters on which Schimkewitsch (1893, p. 30) relied to distinguish his variety *minor* from the typical form of the species. While I concur in the synonymy established by Bouvier (to which, I believe, *C. gardineri* Carpenter, must be added), giving the species the same extended geographical range as *C. gigas*, (see Bouvier, who, however, omits the Malayan records of Loman), it might be possible to establish the existence of distinct species, varieties or local races if one could bring together for comparison the specimens now distributed in museums almost as widely scattered as were the original habitats.

The specimen mentioned by Hoek (1881, p. 65), as intermediate between *C. gigas* and *C. leptorhynchus*, agrees very closely with Cole's account of his *C. cucurbita* (1909, p. 188) except that the proboscis is less expanded at the tip. Loman referred a specimen from the Monaco collections to Cole's species, but Bouvier finds it to be only an example of *C. macerrima* in which the proboscis is less slender than usual. Some

of the specimens mentioned above differ from the typical *C. macerrima* as widely in one direction as *C. cucurbita* does in another and their inclusion under one name suggests the absorption of *C. cucurbita* also.

***Rhopalorhynchus kröyeri* Wood-Mason.**

(Text-fig. 1.)

Rhopalorhynchus kröyeri, Wood-Mason, 1873, p. 171, pl. xiii; Loman, 1908, p. 24, pl. xv, figs. 213—220.

Colossendeis tenuissima, Haswell, 1884, p. 1029, pl. lvi, figs. 5—8.

Rhopalorhynchus clavipes, Carpenter, 1893, p. 24, pl. ii, figs. 1—10.

R. gracillimus, Carpenter, 1907, p. 99, pl. xiii, figs. 25—32.

R. tenuissimus, Flynn, 1919, p. 71, pl. xviii, figs. 1—3.

Localities.—"Andamans, J. Wood-Mason." Reg. No. 401. Holotype, 1 ♂.

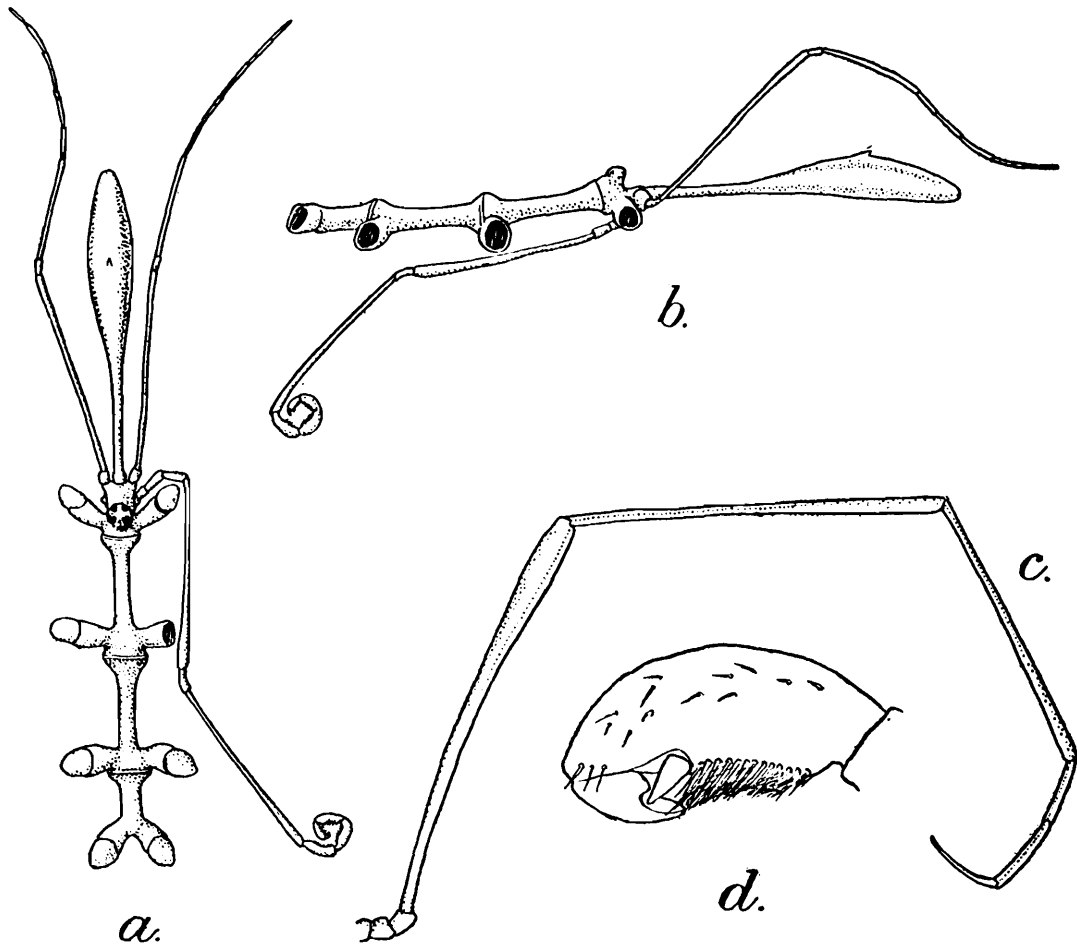


FIG. 1.—*Rhopalorhynchus kröyeri*, Wood-Mason. a. Dorsal view, legs omitted. b. Lateral view, legs omitted. c. Second leg of left side. d. Terminal segment of oviger. (a—c from the Holotype, d from a female from Muscat).

"N. E. of Ceylon, Lat. 8° 51' 30" N., Long. 81° 11' 52" E., 28 fathoms. Marine Survey, Stat. 175." 1 ♂.

"No History." 1 ♂, 1 ♀.

["Between Muscat and Mutha Harbours. Major S. G. Knox, C.I.E." B. M. Reg. No. 1914. 7. 21. 6—10.]

["Torres Straits. A. C. Haddon." Holotype of *R. clavipes*. B. M.]

["Maldive Islands. Prof. Stanley Gardiner." Syntypes of *R. gracillimus*. B. M. Reg. No. 1908, 1. 6. 11—15.]

Notes on Holotype.—Wood-Mason describes and figures two small teeth, one behind the other, on the dorsal surface of the proboscis. The anterior tooth, however, was found on examination to be merely an adherent particle of foreign matter. It became detached on touching with a needle, leaving not the slightest scar on the surface. The holotype, therefore, agrees with all the specimens of *Rhopalorhynchus* that have been described since in having only one tooth on the proboscis.

Measurements of Holotype, in mm.

Length of proboscis	...	...	...	...	5.8
Length of trunk	...	...	...	...	6.75
Second left leg—					
Femur	...	...	...	...	8.16
First tibia	...	...	...	...	7.28
Second tibia	...	...	...	...	5.28
Tarsus	...	...	...	...	1.36
Propodus	...	...	...	...	1.6
Claw	...	...	...	...	1.56
Palp—					
Second segment	...	...	...	...	4.12
Fourth	„	...	...	...	1.96
Fifth	„	...	...	...	0.45
Sixth	„	...	...	...	0.65
Seventh	„	...	...	...	0.72
Eighth	„	...	...	...	0.65
Ninth	„	...	...	...	0.57

The relative lengths of tarsus and propodus vary a little in the different legs and the claw may be slightly longer than the propodus.

Remarks.—Loman, who seems to have overlooked both of Carpenter's species, regards *C. tenuissima* as without question the same as *R. kröyeri*. Flynn, who does not refer to *R. kröyeri*, has no doubt that *R. clavipes* must be regarded as a synonym of *R. tenuissimus*. I have combined these two opinions and, adding *R. gracillimus*, have placed all the described species of the genus in the synonymy of *R. kröyeri*.

The chief characters that have been relied on for discriminating the various species are the supposed presence of two teeth on the proboscis of *R. kröyeri*, the differently shaped proboscis, especially in *R. gracillimus*, and the varying lengths of the claw in proportion to the propodus of the legs. The first of these has already been shown to rest on an error. The proboscis of *R. gracillimus* is narrowly produced anteriorly and the dorsal tooth is well behind the middle of the inflated part, but almost the same outline is shown in Loman's figure (1908, pl. xv, fig. 215) of a specimen which he refers to *R. kröyeri*; some of our specimens, notably those from Muscat, show the same character, but others are intermediate between these and the typical form. As regards the length of the claw, it varies, in our specimens, from a little longer than the propodus to less than half of its length.

Contrary to what Bouvier supposes (1913, p. 52) from Loman's figures, the interval between the bases of palps and ovigers is insignificant (see Flynn, 1919, pl. xviii, fig. 1).

In all cases the oviger has a curious subchelate termination imperfectly figured by Haswell in *R. tenuissimus* (Haswell, 1884 pl. lvi. fig. 7) which is not, as Flynn suggested (1919, p. 72) confined to the male

sex. The short terminal claw is broad and scoop-shaped and in some, perhaps in all cases, it has a deep notch on one side. It is opposed to a stout slightly curved spine.

Ascorhynchus latus, sp. nov.

(Text-figs. 2 and 3.)

Locality.—"Palk Straits, Gulf of Manaar. Marine Survey." 3 ♂.

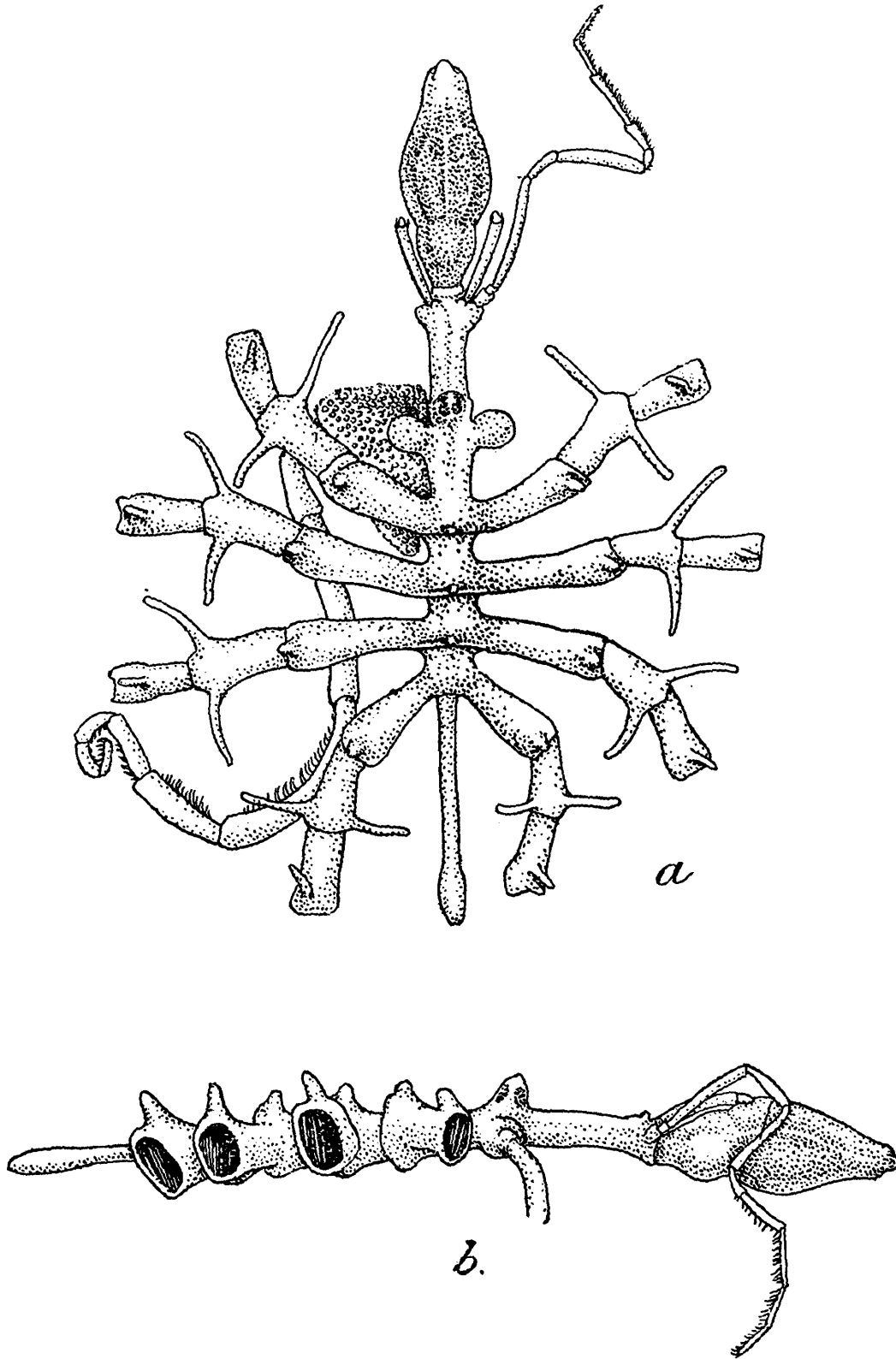


FIG. 2.—*Ascorhynchus latus*, sp. n. a. Male (ovigerous) dorsal view, legs omitted.
b. Lateral view of same.

Description.—*Body* rather elongated, lateral processes separated by about their own diameter, width across second lateral processes eight times that measured between first and second. Cephalon (from base of proboscis to first lateral process) a little longer than rest of trunk ; interval between first lateral process and base of oviger a little less than half the distance from latter to frontal margin. Ocular tubercle set over insertion of ovigers but a little in front, rounded, eyes well marked. A blunt tubercle, little taller than wide, in middle of hind margin of

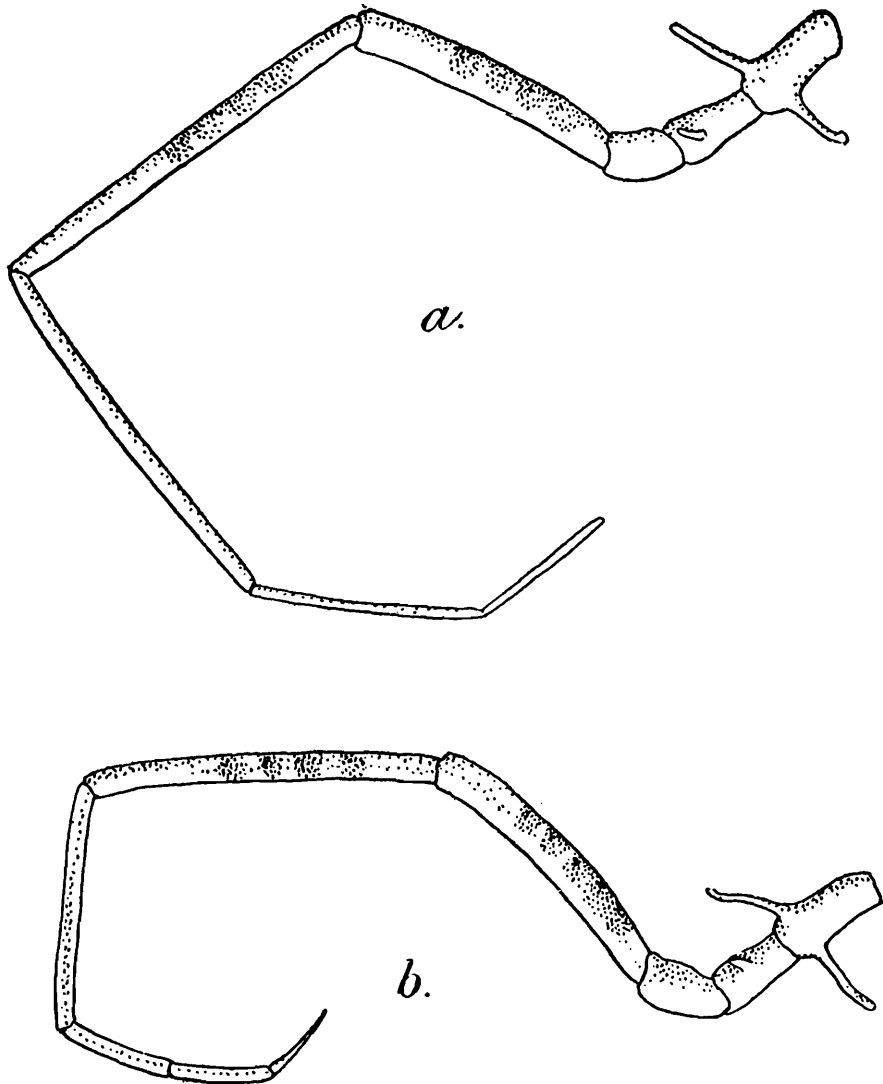


FIG. 3.—*Ascorhynchus latus*, sp. n. a. First leg of left side. b. Third leg of left side.

first three segments, a taller one on each lateral process, and a minute pair over bases of chelophores. Proboscis little more than one-fourth of total length, fusiform, bluntly pointed, with three lips not very deeply cleft, and with a constriction at less than one-third of its length from base. Abdomen slender, swollen at tip, as long as proboscis. *Chelophores* widely separated, less than $\frac{2}{3}$ ths as long as proboscis, scape undivided,¹ distal segment minute and irregular. *Palps* of ten segments. *Legs* with the three coxae successively shorter, first with a pair of long

¹ In one specimen the scape of one of the chelophores is divided.

finger-like processes, second with a shorter dorsal process. First legs much longer than the others, with the second tibia, and especially the tarsus and propodus much elongated and slender and the claw absent.

Measurements, in mm.

Length of proboscis	...	.....	...	...	2.48
Greatest diameter of proboscis	...		...	...	1.04
Length of trunk	...	...	...	...	4.4
Length of cephalon	...	...	...	...	2.36
Width across second lateral processes	...		...	...	3.44
Diameter between first and second lat. processes	...		...	...	0.44
Length of abdomen	...	...	...	...	2.4
					First Leg (left). Second Leg (left).
First coxa	...	...	...	...	0.88 0.88
Second coxa	...	...	...	...	0.76 0.8
Third coxa	...	...	...	...	0.64 0.68
Femur	...	...	...	...	2.6 2.64
First tibia	...	...	...	...	3.88 3.28
Second tibia	...	...	...	...	3.8 2.24
Tarsus	...	...	...	...	2.28 0.96
Propodus	...	...	...	...	1.44 1.04
Claw	...	...	...	...	... 0.72

Remarks.—The species described above is clearly allied to *A. ramipes* (Böhm) (1879, p. 56) and may even prove to be identical with it, but, if Böhm's figure is to be trusted, his species has a much more dilated proboscis and much shorter lateral processes. The latter character is confirmed by Ortmann (1890, p. 161) who says that the lateral processes are "etwa gleich der doppelten Rumpfbreite." In our specimens they are about $3\frac{1}{2}$ times as long. If the synonymy given by Loman (1911, p. 6) for *A. ramipes* be accepted our specimens might well be included under the same name, but I have elsewhere (1922, p. 202) suggested that Loman has undervalued some of the distinctions between *A. ramipes* and certain of the species he identifies with it.

Ascorhynchus sp.

Locality.—"Andamans, off Ross Isd., Port Blair, 2—6 fathoms (S. W. Kemp)." 1 ♀.

Remarks.—The specimen (total length, 6.7 mm.) is pale and soft as if from a recent moult. The somites are contracted and partly telescoped so that measurements are untrustworthy. The scape of the chelophores is inflated. The first legs have no claw and the distal segments are much elongated, the carpus being nearly as long as the second tibia. The lateral processes are only about twice as long as the diameter of the body. The processes on the proximal segments of the legs are mere tubercles.

It seems hardly possible that this can be the female of *A. latus* but the condition of the single specimen is such that a detailed description would be of little value.

***Ascorhynchus* sp.**

Locality.—"N. E. of Ceylon, Lat. $8^{\circ} 51' 30''$ N., Long. $81^{\circ} 11' 52''$ E. 28 fathoms. Marine Survey, Stat. 175." 1 ♂.

Remarks.—This specimen (total length about 9 mm.) is very imperfect. It resembles *A. tenuirostris* Carpenter (1892, p. 555) in having a finger-like process at the end of the femur and the ocular tubercle well in advance of the ovigers, but, unlike that species, it has well-marked spurs on the body and proximal segments of the legs as in *A. ramipes*.

***Ascorhynchus* sp.**

Locality.—"Andamans, Ross Channel, 2—9 fathoms (*S. W. Kemp*)." 1 sp.

"Nancowry Harbour, Nicobar Is., Marine Survey, St. 614. Surface (*Major Seymour R. Sewell*)." 1 sp.

Remarks.—These specimens (total length, 5.4 mm.) are immature, the chelophores being still perfectly chelate. They possess a claw on the first legs, the abdomen is not more than half as long as the proboscis, and the processes on the body and legs are short tubercles. In these characters it resembles *A. auchenicus* (Slater) but the ocular tubercle is more distinctly in advance of the ovigers than in the holotype of that species.

The specimen from Nancowry Harbour, which is not in good condition, differs in some details from the other. It is of interest as having been taken in the tow-net.

***Nymphon andamanense*, sp. nov.**

(Text-fig. 4.)

Locality.—"Andamans, Marine Survey." 1 sp. (? ♂).

Description.—*Body* slender, neck elongated. Cephalic segment half the total length of body, including abdomen; width at base of chelophore, $2\frac{1}{2}$ times diameter of neck. Second free somite (bearing third legs) longer by one-half than the first. Lateral processes well separated, interval between first and second and that between third and fourth equal to diameter of processes, that between second and third $2\frac{1}{2}$ times that diameter; processes bearing ovigers in contact with those of first legs. Abdomen little longer than last pair of processes. Proboscis hardly more than one-third of length of cephalic segment. Ocular tubercle low, rounded, with two papillae placed side by side.

Chelophores with hand little shorter than scape, fingers less than half as long again as the palm, not very strongly curved, with slender, widely-spaced teeth.

Palps with second segment hardly longer than third, and less than half as long again as fourth or fifth.

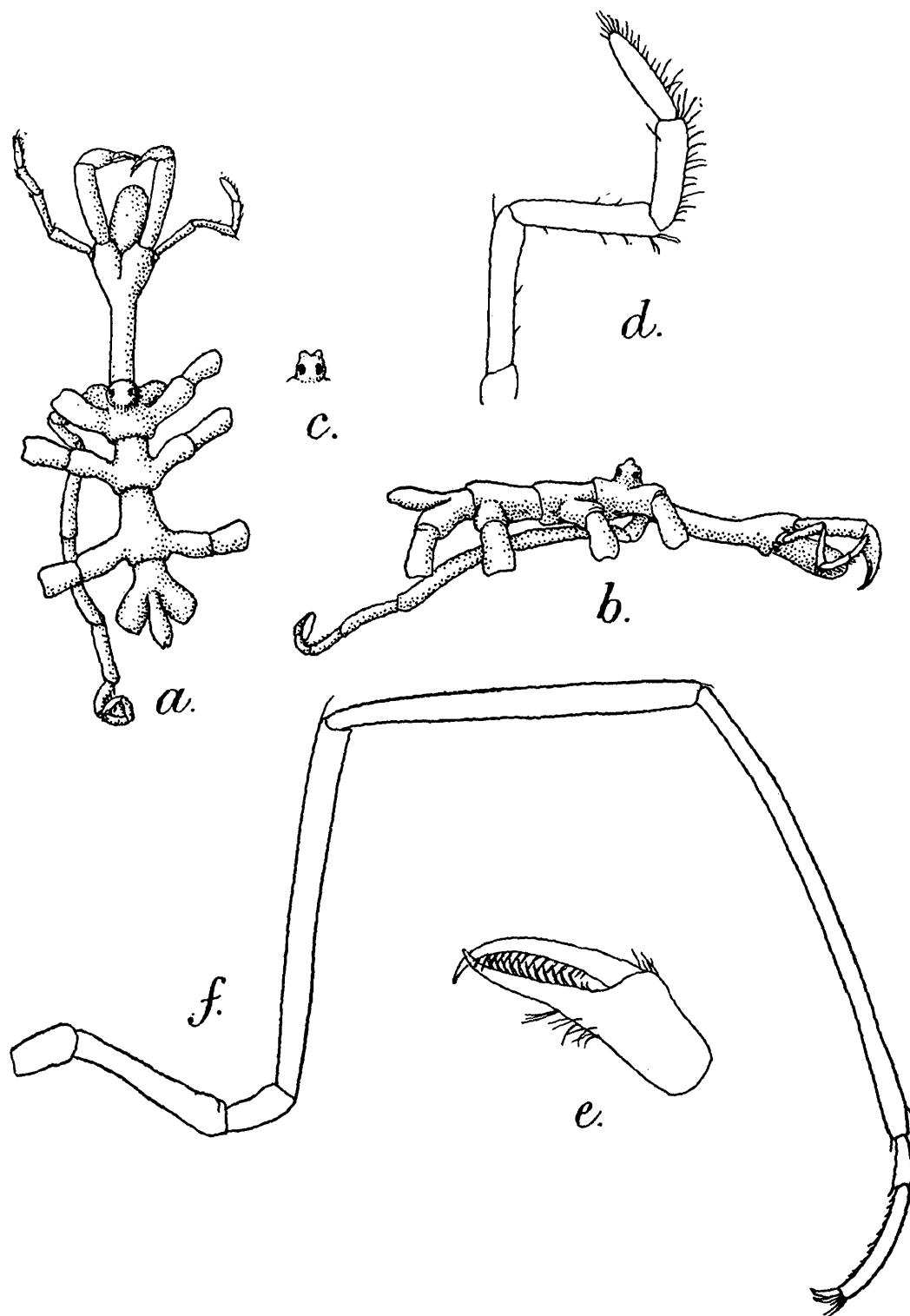


FIG. 4.—*Nymphon andamanense*, sp. n. a. Dorsal view, legs omitted. b. Lateral view. c. Ocular tubercle from front. d. Palp. e. Chela. f. Third leg of left side.

Legs slender, almost bare of setae or spines; second coxa three times as long as the first, femur a little shorter than first tibia and $\frac{3}{4}$ as long as second; propodus three times as long as tarsus and four times as long as main claw which is only a little longer than the auxiliaries.

<i>Measurements, in mm.</i>				
Length of proboscis (above)	...	...	...	0.68
Length of cephalon (to base of ocular tubercle)...	...	...	...	1.4
Total length of trunk	...	...	...	3.28
Length of abdomen	...	...	...	0.52
Third right leg—				
First coxa	...	...	...	0.45
Second coxa	...	...	...	1.6
Third coxa	...	...	...	0.6
Femur ...	...	...	...	3.44
First tibia	...	...	...	3.52
Second tibia	...	...	...	4.4
Tarsus ...	...	...	...	0.4
Propodus	...	...	...	1.2
Claw ...	...	...	...	0.24

Remarks.—Among the few species of the genus *Nymphon* that have been described from tropical seas, this species would seem to approach most closely *N. maculatum* Carpenter (1910, p. 256) from the Red Sea. It differs from that species in the much shorter neck and longer proboscis, in having the first free somite much shorter than the second, the palm much longer, the fingers of the chelophores less curved, and the second tibia of the legs longer than the first.

Pallene pectinata, sp. nov.

(Text-fig. 5.)

Locality.--From tube labelled " 21 " without indication of locality.
 1 ♂.

Description.—*Body* rather short, lateral processes of second and third pairs separated by less than their diameter. Cephalic segment nearly 1½ times as long as rest of trunk. Neck very short, merely a constriction in middle of cephalic segment. Abdomen very short.

Chelophores short and stout, the scape hardly more than twice as long as thick.

Legs with second coxa longer than first and third together, femur longer than first and shorter than second tibia, propodus not strongly curved, with three or four strong spines at the base ; claw strongly curved, auxiliaries nearly two-thirds as long as main claw, with spiniform teeth on inner edge at the base, those of first legs with three teeth, those of third legs with one tooth.

<i>Measurements, in mm.</i>				
Length of proboscis (below)	...	...	...	0.23
„ trunk	...	...	...	0.67
„ abdomen	...	...	...	0.07
Third left leg—				
First coxa	...	...	...	0.1
Second coxa	...	...	...	0.35
Third coxa	...	...	...	0.14
Femur ...	...	...	...	0.51
First tibia	...	...	...	0.48
Second tibia	...	...	...	0.58
Tarsus and propodus	...	...	...	0.28

Remarks.—Judging from the characters of the single specimen, this would seem to be a member of the genus *Pallene* in the restricted sense.

From most of the allied species it is distinguished by the abbreviation of the "neck," a character, however, subject to variation in other species. It has some resemblance in general form to *P. novae-zealandiae* Thomson (1884), but the latter (described from a solitary female) appears to have shorter claws. The most unusual feature of the present species, however, is the compound or pectinate structure of the auxiliary claws. The only Pycnogonid in which a similar structure has been described is *Pallene phantoma* Dohrn, a species differing widely from that now described in the much greater elongation of the body and especially of the "neck."

***Pallene* sp.**

Locality.—“Pamban, Ramnad district, Gulf of Manaar. From weeds, 0—2 fathoms. February 1913 (S. W. Kemp).” 1 ♀.

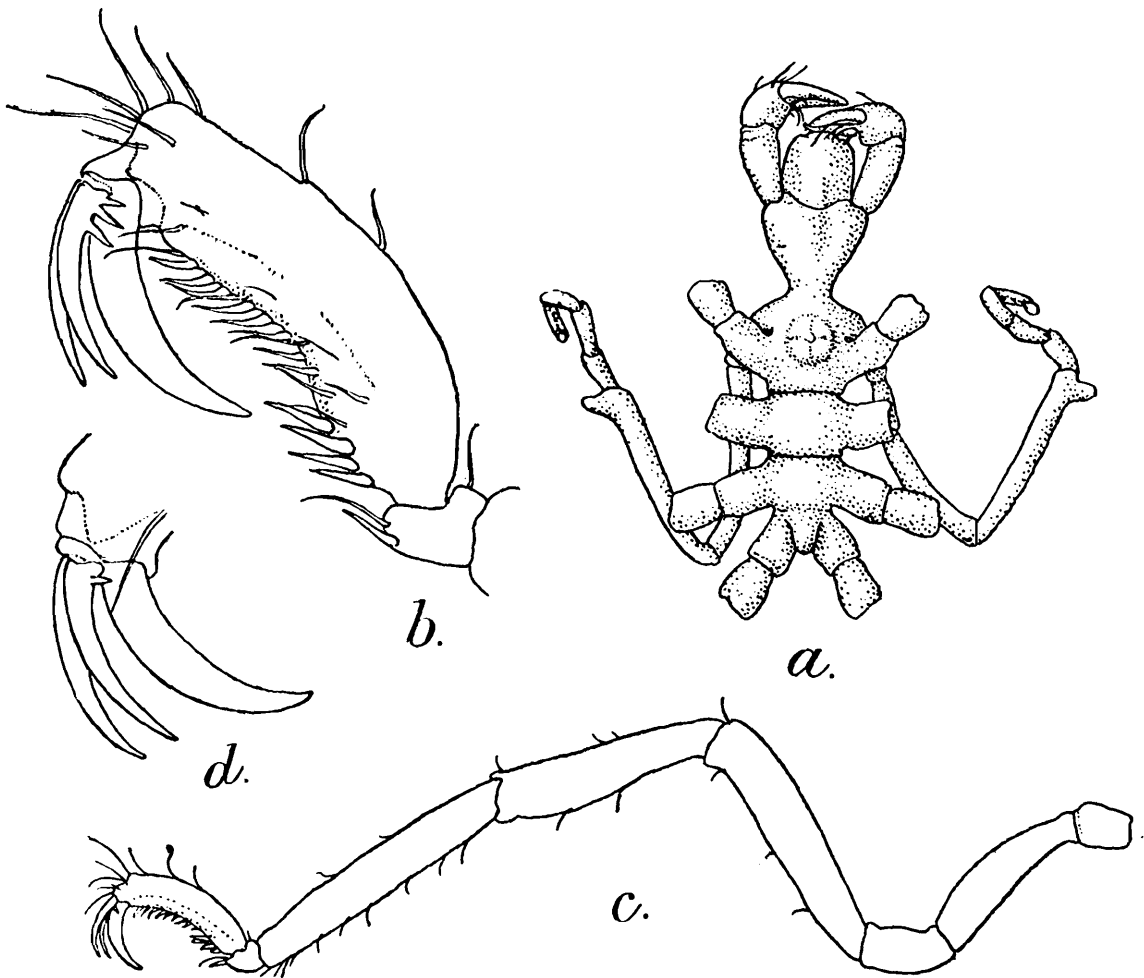


FIG. 5.—*Pallene pectinata*, sp. n. Male. *a.* Dorsal view, legs omitted. *b.* Propodus of first leg, left side. *c.* Third leg of left side. *d.* Claws of third leg.

Remarks.—This specimen (total length 1.12 mm.) resembles *P. producta* Sars, in the elongated body and "neck" but it appears to differ in having the proboscis and chelophores even shorter than in that species. There is a distinct prominence on the ventral side of the dilated femora which may prove to be a specific character. In the absence of any striking peculiarities it appears inadvisable to attempt to define a new species from this solitary specimen.

Parapallene kemp, sp. nov.

(Text-fig. 6.)

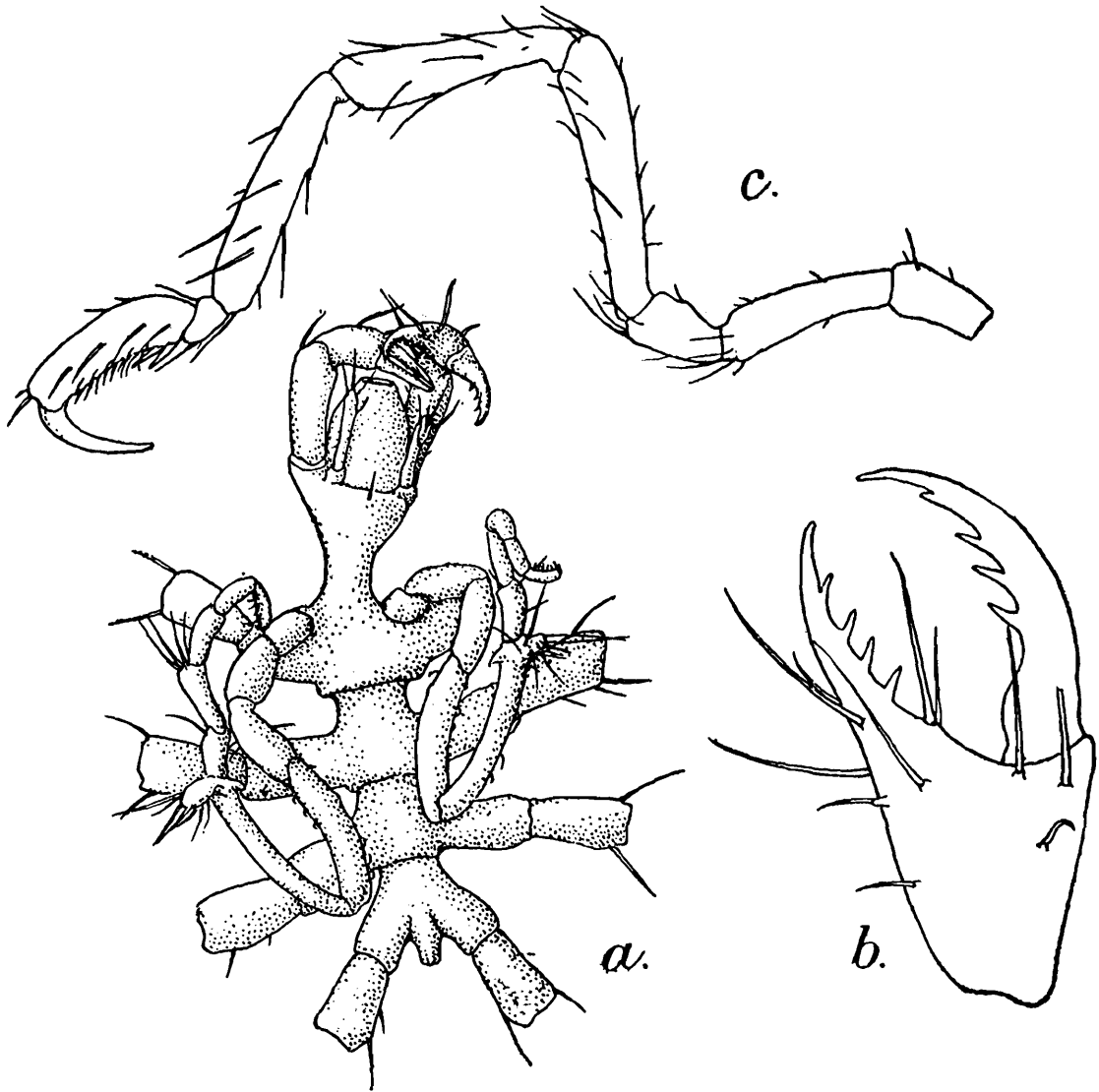
Localities.—"Orissa coast, December, 1888." 1 ♀."Kilakarai, Ramnad district, Gulf of Manaar. From weeds, 0—2 fathoms. February, 1913 (*S. W. Kemp*)," 2 ♂ and 3 ♀."Waltair, Madras Presidency, Stat. 3. January, 1921. (*S. W. Kemp*)." 4 ♀, 1 ♂, 1 yg.

FIG. 6.—*Parapallene kemp*, sp. n. Male. *a*. Ventral view, legs omitted. *b*. Chela. *c*. Third leg of right side.

Description.—*Body* completely segmented, elongated, the lateral processes separated by about their own diameter. Cephalic segment more than half the length of trunk, neck constricted to $\frac{1}{2}$ or $\frac{1}{3}$ of diameter of anterior part. Ocular tubercle low, broadly rounded, with a small, partly sunken tubercle on each side above the eyes. Proboscis about half as long as cephalic segment, a little constricted just above the base, distal half conical, truncated, with projecting finely setose lips. Abdomen very short, cylindrical, expanded at the base where it is wedged in between the last pair of lateral processes.

Chelophores stout, scape a little longer than proboscis, palm shorter than fingers which are strongly curved and armed with a few long widely-spaced teeth.

Palps of male shorter than proboscis, of two segments, the basal one very short, the distal about six times as long, slightly clavate, with a few long setae.

Ovigers of male of 10 segments, the fifth the longest; fourth and fifth with a few curved hooks, distal lobe of fifth with a tuft of strong setae; distal segments with lanceolate, acute, strongly serrate spines with one or two pairs of the basal serrations enlarged; no terminal claw. *Ovigers* of female shorter, fourth segment the longest, without curved hooks on fourth and fifth.

Legs with second coxa about twice as long as first or third, femur a little longer than first or second tibia; propodus with two strong spines proximally, no auxiliary claws.

Measurements, in mm.

			Male.	Female.
Length of proboscis (below)	...	...	0.26	0.33
„ trunk	...	...	1.2	1.25
„ abdomen	...	...	0.1	0.12
„ scape of chelophore	...	...	0.32	0.35
Third left leg—				
First coxa	...	...	0.25	0.25
Second coxa	...	...	0.43	0.43
Third coxa	...	...	0.19	0.2
Femur	...	...	0.67	0.8
First tibia	...	...	0.59	0.68
Second tibia	...	...	0.58	0.75
Tarsus and propodus	...	...	0.5	0.5
Diameter of eggs carried by male	...	...	0.2	

Remarks.—This species agrees in general with Böhm's brief description of his *Pallene longiceps* from Japan, especially in having palps of two segments not reaching to the end of the rostrum and in the long curved fingers of the chelae with widely separated teeth; but Böhm described the body as shortened, with narrow intervals between the lateral processes, the abdomen as oval, and the three coxal segments of the legs as short. The size of the Japanese specimens is also much greater than that of the Indian examples. Ortmann figures a female from Sagami Bay which shows all these differences from the form here described and in addition has the second tibia only half as long as the first and the propodus very long and slender.

***Parapallene hospitalis* Loman.**

Parapallene hospitalis, Loman, 1908, p. 45, pl. viii, figs. 102—111.

Locality.—From tube labelled “No history. No locality.” 2 specimens.

Remarks.—The specimens are in very bad condition but so far as can be seen they agree with Loman's account of this species except in the following particulars:—

There is no constriction of the neck immediately in front of the first lateral processes.

The proportions of the body are slightly different from Loman's description, which, however, does not agree altogether with his figures.

The proximal spines of the propodus are distinctly enlarged.

The chelae, seen from the dorsal side in their natural position, have the movable finger on the inner side, as in Loman's fig. 110, not as in his fig. 109.

This species differs widely in important characters from the last and its retention in the same genus can only be provisional. Loman's delimitation of the genus *Parapallene* is apparently not altogether satisfactory even to himself. It may be worth pointing out, therefore, that this species recalls, in the outline of the proboscis and the form of the chelophores, some of the Antarctic species for which Hodgson (1914, p. 161) established the genus *Austropallene*. It differs from them chiefly in having a large claw on the oviger and no spurs over the bases of the chelophores.

***Pallenopsis annandalei*, sp. nov.**

(Text-figs. 7 and 8.)

Locality.—"Laccadive Sea, Lat. 13° 47' 49" N., Long. 73° 7' E., 636 fathoms. Marine Survey, Stat. 177." 1 ♂

Description.—*Body* fully segmented, elongated, the lateral processes separated by about their own diameter. Cephalon widened in front. Proboscis half as long as trunk, not wider at tip than in middle. Ocular tubercle low, rounded, recumbent; eyes small, pigmented but indistinct. Abdomen long, clavate, more than half as long again as last pair of lateral processes.

Chelophores slender, scape with two segments, the first nearly as long as proboscis and twice as long as second. Fingers longer than palm, slender, curved, gaping when closed.

Palp represented by a low rounded papilla.

Oviger with ten distinct segments.

Legs long and slender, the first four segments without conspicuous setae, the femur and second tibia with numerous long soft hairs partly set in a row along the lateral line and partly scattered over the dorsal surface. The femur is longer than the first and shorter than the second tibia. The length of the curved femoral gland-tube is about half the diameter of the segment.

Male genital openings on low rounded prominences on the last two pairs of legs. Auxiliary claws very small, less than one-fourth of length of main claw.

Measurements of Holotype (male) in mm.

Length of proboscis	...	...	...	...	3.6
" of trunk	...	...	...	...	7.0
" of abdomen	...	...	...	...	3.75
" of first segment of chelophore	...	...	...	...	3.4
" of second segment of chelophore	...	...	...	...	1.8
Third left leg—					
First coxa	...	...	...	...	1.5
Second coxa	...	...	...	...	5.5
Third coxa	...	...	...	...	2.5
Femur	...	...	...	...	17.4
First tibia	...	...	...	...	16.75
Second tibia	...	...	...	...	21.25
Tarsus and propodus	...	...	...	...	3.2

Remarks.—Loman (1916, p. 15) has given a synopsis of 33 species which he recognizes in the genus *Pallenopsis* (including *Rigona*). Among these a considerable number agree with the form now described in having

the segmentation of the body and of the chelophore scape distinct and eyes and auxiliary claws present. The species of this group are distin-

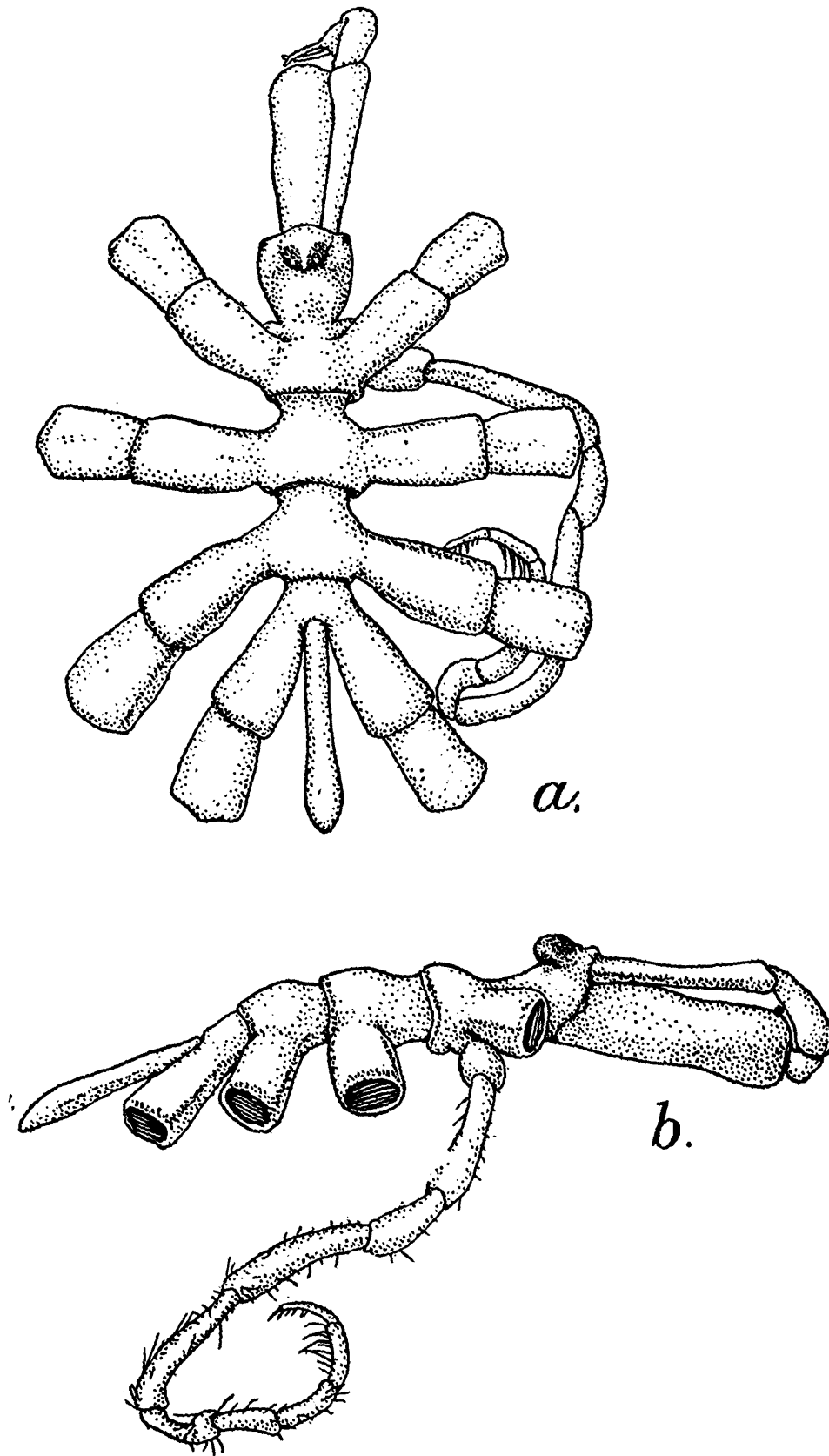


FIG. 7.—*Pallenopsis annandalei*, sp. n. Male. a. Dorsal view, legs omitted. b. Lateral view.

guished from each other by relatively small characters, some of which may be tabulated as follows :—

- A. Body and legs with numerous long hairs ... *P. pilosa* (Hoek).
P. villosa Hodgson.
P. lanata Hodgson.
- B. Long hairs, if present, restricted to tibiae of legs.—
 a. Fingers of chelophores shorter than palm, broad, meeting when closed ... *P. forcifer* Wilson.
P. patagonica (Hoek).
P. glabra Hodgson.
P. johnstoniana (White).

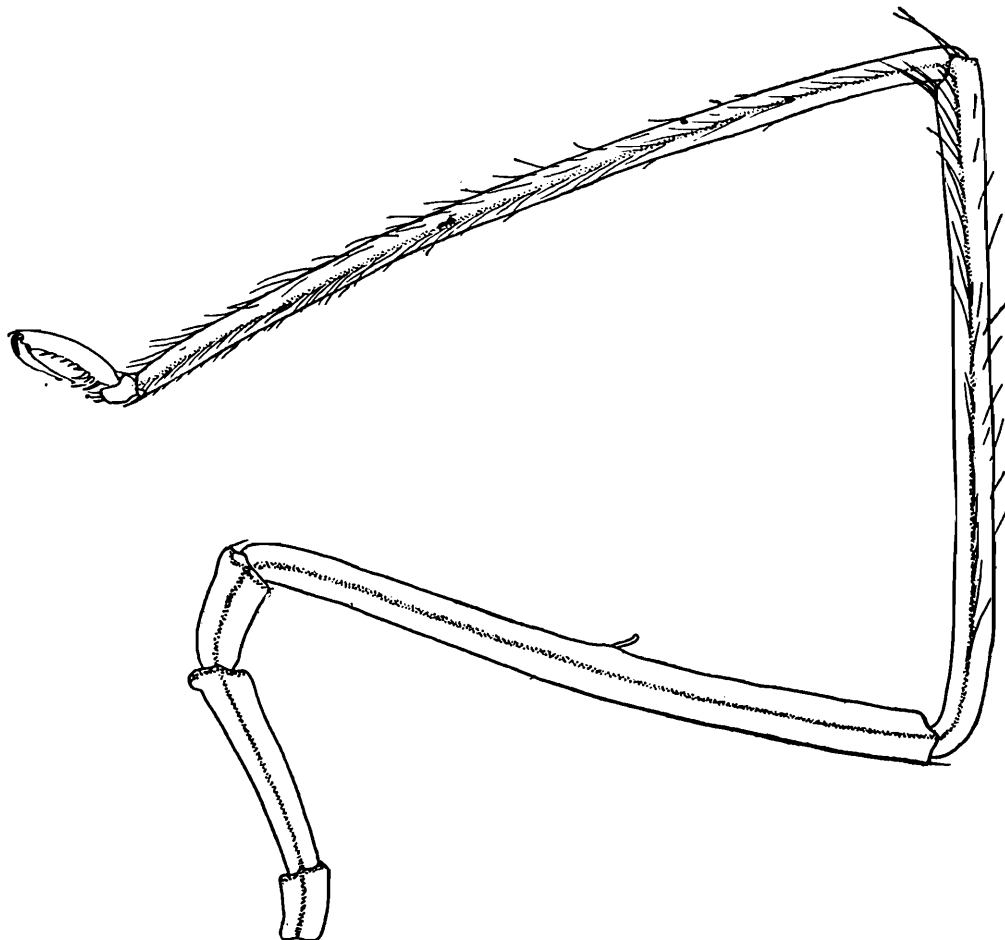


FIG. 8.—*Pallenopsis annandalei*, sp. n. Third leg of left side.

- b. Fingers of chelophores equal to or longer than palm, slender, gaping when closed.—
 a.¹ Proboscis widest at tip ... *P. oscitans* (Hoek).
P. plumipes Meinert.
- b.¹. Proboscis not widest at tip—
 a.². Proboscis as long as scape of chelophores or nearly so; second segment of scape at least $\frac{2}{3}$ as long as first ... *P. longirostris* Wilson.
P. tritonis (Hoek).
 (incl. *P. holti* Carpenter.)
P. mollissima (Hoek).
P. californica Schimkewitsch.
- b.². Proboscis hardly longer than first segment of scape which is twice as long as second ... *P. annandalei*, sp. nov.

Pallenopsis (Rigona) alcocki, sp. nov.

(Text-figs. 9 and 10.)

Locality.—"Andaman Sea, Lat. $14^{\circ} 38' 15''$ N., Long. $96^{\circ} 24' 30''$ E. 53 fathoms. Stat. 225, Marine Survey." 16 specimens.

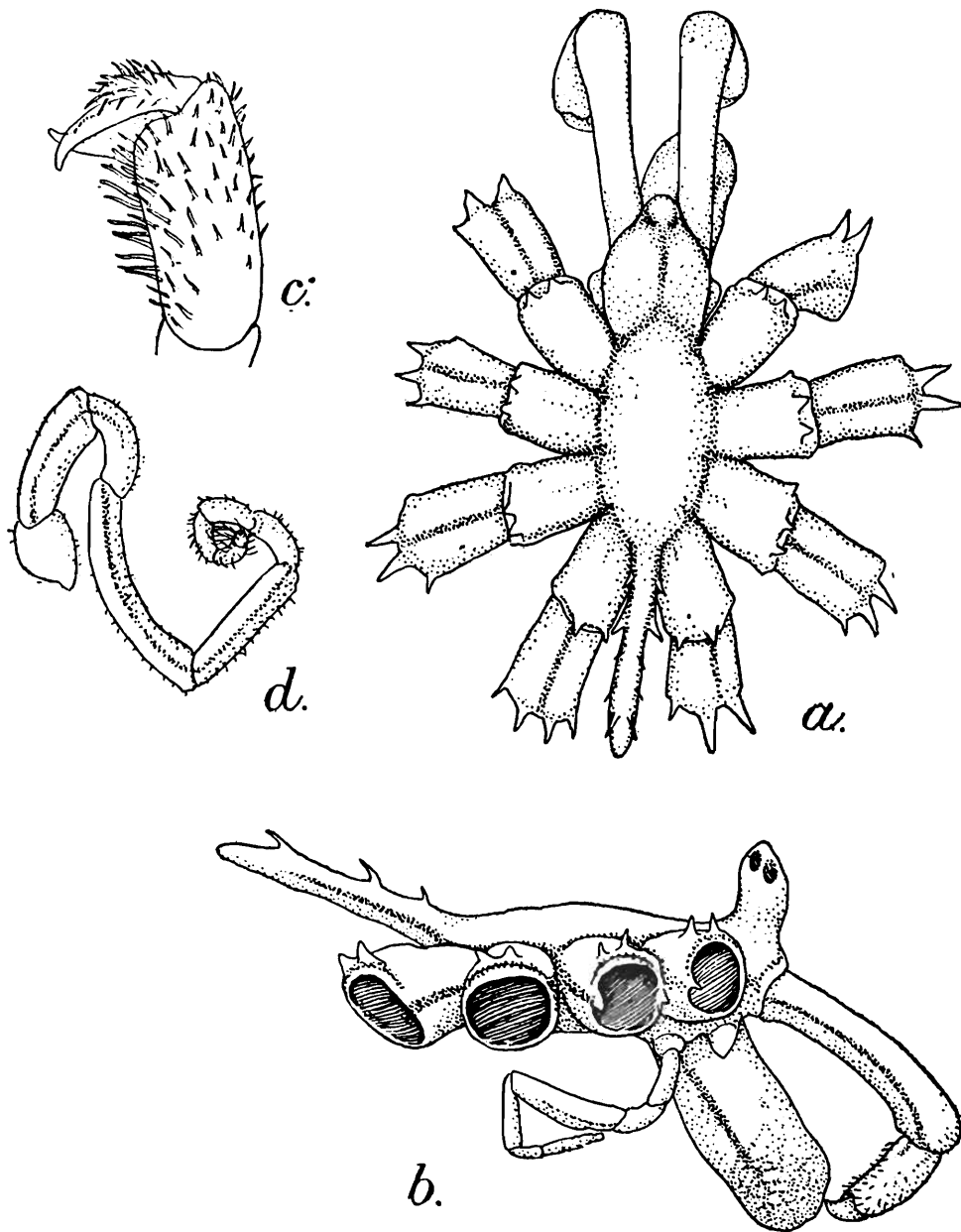


FIG. 9.—*Pallenopsis (Rigona) alcocki*, sp. n. Female. a. Dorsal view, legs omitted. b. Lateral view. c. Chela. d. Oviger of Male.

Description.—*Body* unsegmented, short, the lateral processes in contact at their bases. Separating the lateral processes from the body on dorsal and ventral surfaces is a dark-brown line or rod-like thickening of the chitin forming an elliptical frame within which the integument remains thin, transparent and almost membranous, so that the internal organs are clearly visible. Opposite each junction of successive lateral processes the dorsal frame is produced inwards in a short point and these points are connected across the membrane of the dorsal surface by faint intersegmental grooves. Anteriorly the dorsal frame runs out

into a median rod and a pair of lateral ones on the cephalon and laterally it is connected with the strongly marked system of "lateral lines" on the legs. On the distal part of the proboscis the median rod of each of the three antimeres breaks up into a less distinct network of chitinous thickenings. Cephalon rather more than half as long as remainder of trunk (without abdomen). Ocular tubercle tall, with pointed apex directed a little backward; eyes large, posterior pair higher than anterior. Abdomen nearly as long as middle part of trunk, with spine-tipped tubercles, not quite symmetrical, on dorsal and lateral surfaces.

Chelophores with slender scape showing no trace of jointing; palm more than twice as long as wide, spinose; movable finger with a spinose cushion for more than half its length.

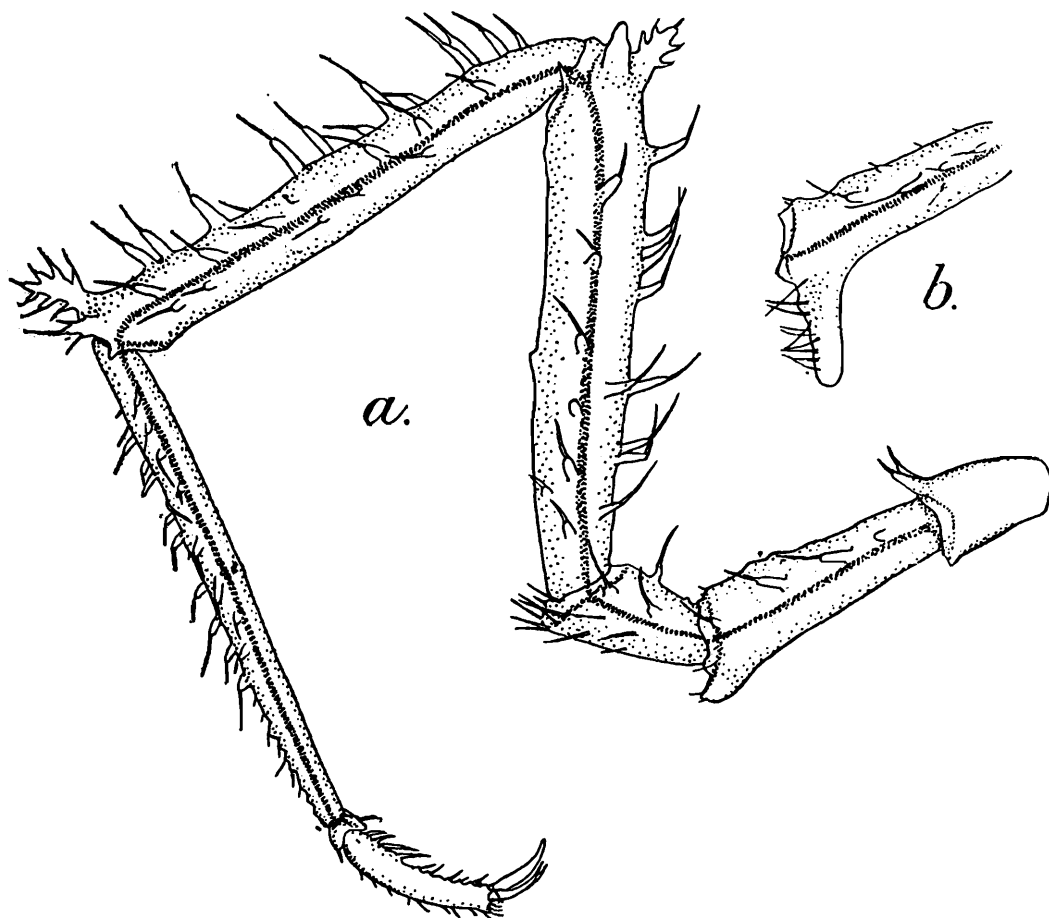


FIG. 10.—*Pallenopsis (Rigona) alcocki*, sp. n. a. Third left leg of female. b. Second coxa of last leg of male.

Palp represented by a conical papilla.

Oviger of male with ten distinct segments; that of female with last four segments coalesced.

Legs beset dorsally, from first coxa to second tibia, with finger-like processes each bearing a long apical spine. These processes are tallest and most numerous on femur and first tibia. The distal end of first coxa, femur and first tibia bears in each case five tubercles, of which three on the femur and first tibia become long processes, the median one bearing secondary spine-tipped tubercles. The first tibia is longer than the femur but shorter than the second tibia. In the male, the gland-tube on the ventral edge of the femur is longer than half the diameter of the

segment. The genital openings of the female are on short processes of the second coxa of all the legs ; those of the male on long processes on those of the last two pairs. The auxiliary claws are about two-thirds of the length of the main claw.

Measurements of holotype (female), in mm.

Length of trunk	..	...	...	...	3.92
„ abdomen	...	...	...	...	2.2
„ scape of chelophore	...	...	...	...	2.52
Third left leg :—					
First coxa ...	...	...	...	...	1.12
Second coxa	...	...	...	...	2.88
Third coxa	...	...	...	...	1.6
Femur ...	...	...	...	...	5.68
First tibia ...	...	...	...	...	6.0
Second tibia	...	...	...	...	7.6
Tarsus and propodus	...	...	...	...	1.76

Remarks.—Among the species of *Pallenopsis* enumerated by Loman that now described approximates to *P. crosslandi* Carpenter (1910, p. 257) by the finger-like spine-bearing processes with which the legs are armed. From *P. crosslandi* it differs in having these processes not restricted to the first tibia, the segmentation of the body completely obscured, the scape of the chelophores undivided, the female genital openings elevated on prominences and the auxiliaries distinctly shorter than the main claw.

The condition of the exoskeleton in this species is interesting and represents an advanced stage in a process that can be traced, more or less distinctly, in other species of the subgenus *Rigona*. This is the replacement of the system of supporting tubes which constitutes the exoskeleton of ordinary Arthropods by a framework of rods, a “skeleton” in the more popular sense of the word. The process has gone furthest in the case of the trunk and proximal segments of the legs, where the membrane filling the interspaces of the framework is very thin and soft. The distal segments of the legs retain the more usual condition in the stiffness of the whole exoskeletal tube.

***Pallenopsis (Rigona) ovalis* Loman.**

(Text-fig. 11.)

Pallenopsis (Rigona) ovalis, Loman, 1908, p. 68, pl. x, figs. 137—138.

Locality.—“ Andamans, off Ross Id., Port Blair, 2-9 fathoms. (S. W Kemp.)” 2 ♀

“ N. Cheval Paar, Ceylon, (T. Southwell).” 1 ♂.

Measurements, in mm.

Length of trunk	...	...	...	...	2.8
Third leg :—					
First coxa ...	...	...	...	...	0.75
Second coxa	...	...	...	...	1.6
Third coxa	...	...	...	...	1.1
Femur ...	...	...	...	...	3.6
First tibia ...	...	...	...	...	3.7
Second tibia	...	...	...	...	4.27
Tarsus and propodus	...	...	...	...	1.5

Remarks.—The measurements and drawings here given are taken from the larger of the two specimens, which is a little smaller and, judging from the shortness of the ovigers, less mature than Loman's type. The agreement with Loman's account is fairly close except in the following points. The trace of a longitudinal division of the cephalon observed by Loman is due to the presence of a median rib of chitin like that described above in *P. alcocki*. The anterior eyes are hardly larger than the hinder pair. The abdomen is not directed straight backwards but is strongly elevated. In the legs, the third coxa is distinctly longer

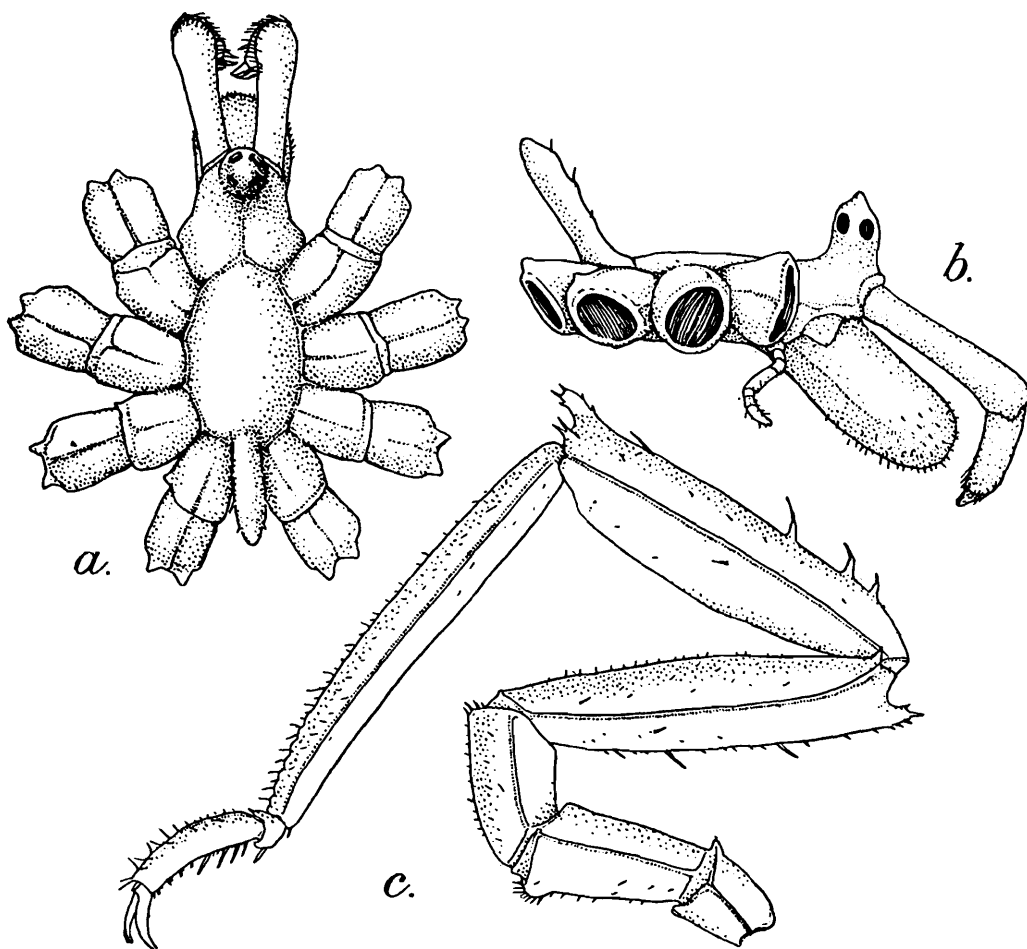


FIG. 11.—*Pallenopsis (Rigona) ovalis*, Loman, Female. a. Dorsal view, legs omitted. b. Lateral view. c. Third left leg.

than the first ; the femur and first tibia have each five processes distally, although only the median dorsal one is large and conspicuous ; the second tibia is distinctly longer than the first.

Anoplodactylus cribellatus, sp. nov.

(Text-fig. 12.)

Locality.—"Andamans, off Ross Id., Port Blair, 2-9 fathoms. (S. W Kemp.)" 2 ♂.

"Andamans, Marine Survey." 1 ♂.

Description.—*Body* elongated, the lateral processes separated by more than their diameter, last two somites coalesced. Neck of cephalon arrowed in the middle. Ocular tubercle vertical, pointed. Proboscis

dilated in its proximal fourth, then cylindrical. Abdomen as long as last pair of lateral processes, directed obliquely upwards.

Chelophores slender, scape distinctly longer than cephalic segment.

Legs slender, second coxa longer than first and third together, femur and first and second tibiae successively diminishing in length. Propodus with marked basal projection bearing two large unpaired spines followed by one pair and a series of rather slender spines extending nearly to base of claw, where there is a very short lamina. Claw long and slender, auxiliaries minute. Second coxa of last legs ending below in a short pointed process, that of penultimate legs without process; in neither case could the genital apertures be clearly seen. Femora of all legs with a series of about 15 cribriform gland-openings on dorsal surface.

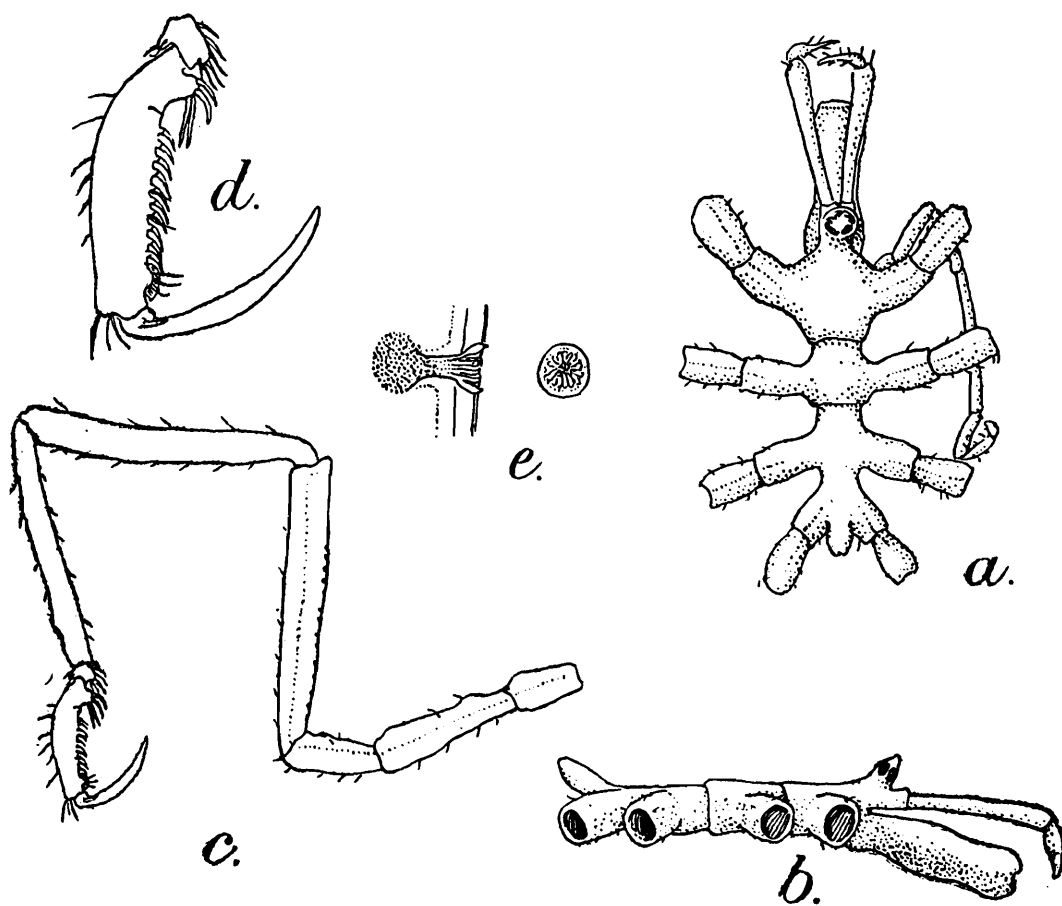


FIG. 12.—*Anoplodactylus cribellatus*, sp. n. Male. a. Dorsal view, legs omitted. b. Lateral view. c. Third leg of left side. d. Propodus of third leg. e. Optical section and surface view of "sieve-plate" opening of femoral gland.

Measurements, in mm.

Length of proboscis (below)	...	...	...	1.1
„ trunk	...	...	...	1.48
„ abdomen	...	...	...	0.24
„ scape of chelophore	...	...	...	0.75
Third left leg :—				
First coxa	...	...	...	0.3
Second coxa	...	...	...	0.75
Third coxa	...	...	...	0.4
Femur	...	...	...	1.33
First tibia	...	...	...	1.25
Second tibia	...	...	...	1.1
Tarsus and propodus	...	...	...	0.7

Remarks.—Most of the species of *Anoplodactylus* of which the males have been described differ from those of *Phoxichilidium* in that the femoral cement glands open by a single tubular orifice on the dorsal surface of the femur, whereas in *Phoxichilidium* there are numerous openings not produced into tubes. Loman states (1908, p. 18) that *A. oculatus* Carpenter is the only species forming an exception to this rule, overlooking the fact that the *Phox. angulatum* of Dohrn, which Loman transfers to *Anoplodactylus*, also possesses glands of the *Phoxichilidium*-type. The species here described resembles in many details Carpenter's *A. oculatus* which, however, differs in having the ocular tubercle very tall and acutely pointed, the legs more spiny, with a distinct process at the end of the femur and the two tibiae subequal. The femoral gland-openings are described by Carpenter simply as "cupshaped" but from his figure they appear to be, as in the present species, circular sieve-plates with a raised rim, each giving exit to a bundle of ducts.

***Anoplodactylus saxatilis*, sp. nov.**

(Text-fig. 13.)

Locality.—"Marble Rocks, Mergui Archipelago. 27th March, 1887. Marine Survey." 1 ♂.

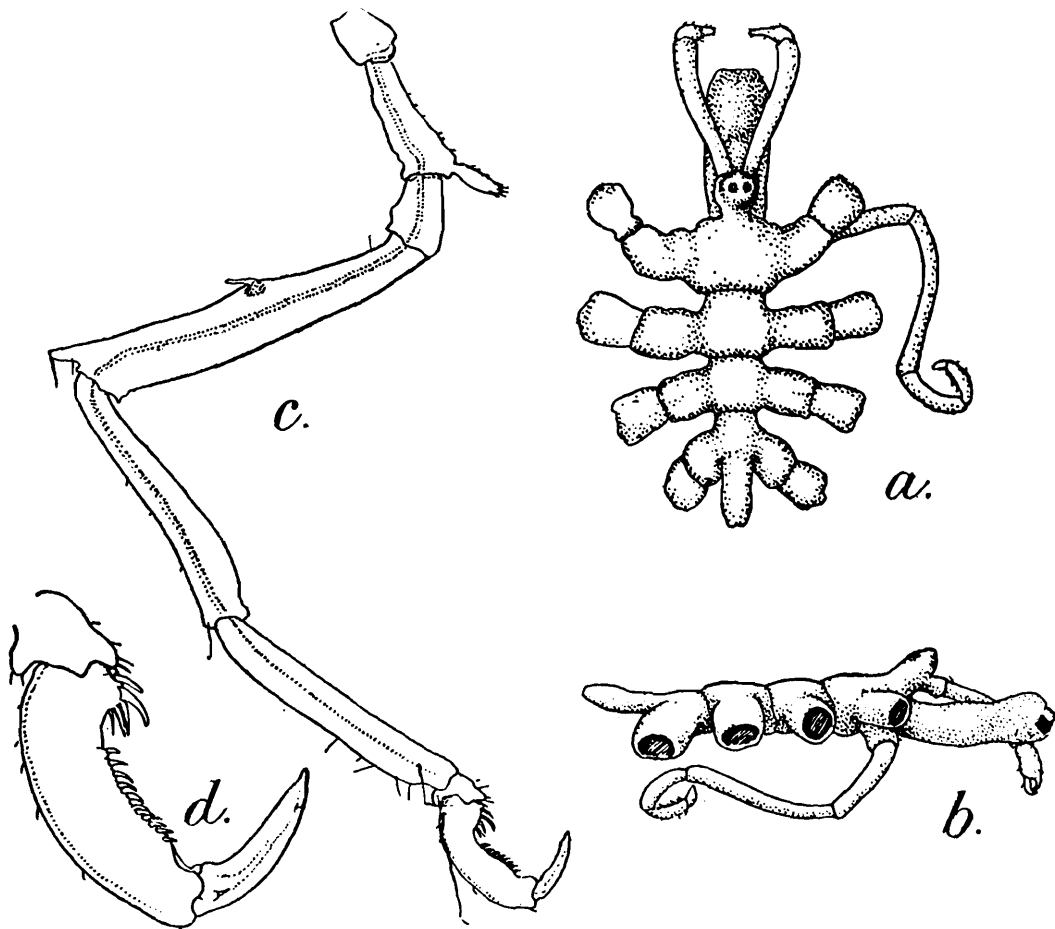


FIG. 13.—*Anoplodactylus saxatilis*, sp. n. Male. a. Dorsal view, legs omitted. b. Lateral view. c. Third leg of left side. d. Propodus of third leg.

Description.—*Body* rather stout, the lateral processes separated by about half their diameter. Neck of cephalon slightly constricted.

Ocular tubercle low, pointed. Proboscis cylindrical, slightly recurved. Abdomen longer than last pair of lateral processes, slightly elevated.

Chelophores slender, scape as long as cephalic segment.

Legs moderately slender, second coxa hardly longer than first and third together. Femur longer than the equal tibiae, with a prominent distal spine-tipped process and a dorsal gland-tube shorter than the width of the segment. Propodus with prominent basal projection bearing two unpaired spines, distal portion of ventral edge with a close-set row of spines and without lamina. Claw short and stout, auxiliaries very minute. Second coxa of last two pairs produced distally into a genital process, constricted at the base and more than one-third as long as the segment.

Measurements, in mm.

Length of proboscis (below)	...	...	...	1.15
„ trunk	...	...	...	1.65
„ abdomen	...	...	...	0.45
„ scape of chelophore	...	...	...	0.85
Third left leg :—				
First coxa	...	...	...	0.35
Second coxa	...	...	...	0.9
Third coxa	...	...	...	0.47
Femur	...	...	...	1.92
First tibia	...	...	...	1.72
Second tibia	...	...	...	1.72
Tarsus and propodus	...	...	...	0.96

Remarks.—The only species of *Anoplodactylus* known to have the male genital processes as long as those described above is *A. vershuysi* Loman (1908, p. 73), in which, however, the body is greatly elongated, the lateral processes being separated by three or four times their diameter. Among the species of which only females have been described, this form would appear to resemble most closely *A. digitatus* Böhm (redescribed by Loman, 1908, p. 74), but that species is stated to have no auxiliary claws.

***Anoplodactylus investigatoris*, sp. nov.**

(Text-fig. 14.)

Localities.—“ Madras. Outside harbour, along eastern wall. *S. W. Kemp.*” 1 ♀.

“ Marine Survey. No locality.” In tube, together with some unrecognizable fragments, labelled “*Pallene investigatoris*, n. sp.” 1 ♀.

Description (from Madras specimen).—*Body* short, the lateral processes separated by about half their diameter, segmentation distinct. Neck of cephalon narrowed in middle. Ocular tubercle inclined forwards, pointed. Proboscis cylindrical, slightly recurved, with a group of four papillæ on the ventral surface about one-third of its length from the base; the hinder pair of papillæ larger than those in front, all of them inclined forwards. Abdomen as long as last pair of lateral processes, directed obliquely upwards.

Chelophores moderately slender, scape longer than cephalic segment.

Legs with second coxa equal to first and third together. Femur longer than the equal tibiae. Propodus strongly curved at base with

three unpaired spines, distal part of ventral edge with a close-set row of stout curved spines without a lamina. Auxiliary claws very minute. A short rounded genital prominence on the second coxae of all the legs, that on the last pair not more than $\frac{1}{5}$ th of the length of the segment.

The specimen from an unknown locality mentioned above differs from that just described in the somewhat greater elongation of the body, of which the lateral processes are separated by about their own diameter ; also in having the tubercles on the proboscis less prominent and placed a little further forward, the anterior pair about the middle of the length of the proboscis.

Measurements of Madras specimen, in mm.

Length of proboscis (below)	...	...	...	1.35
„ trunk	...	...	...	1.8
„ abdomen	...	...	...	0.33
„ scape of chelophore	...	...	...	1.0
Third left leg :—				
First coxa	...	...	...	0.3
Second coxa	...	...	...	0.9
Third coxa	...	...	...	0.45
Femur	...	...	...	2.12
First tibia	...	...	...	1.8
Second tibia	...	...	...	1.8
Tarsus and propodus	...	...	...	1.0

Remarks.—I do not know of any Pycnogonid having a structure of the proboscis comparable to that described above. The four tubercles have, at first sight, the appearance of embryonic limb-buds, and one might even be tempted for a moment to suppose that they represented rudiments of palps and ovigers. This, however, is out of the question, since the proboscis, whatever its morphological nature may be, is not a somite. No opening could be detected on the papillae, the integument on which appears to resemble exactly that of the adjacent surface of the proboscis, and no gland could be discovered internally.

Anoplodactylus sp.

Locality.—“ Yé, Burma. 27th March, 1887 Marine Survey.” 1 ♀.

Remarks.—This specimen (1.23 mm. in length of trunk) resembles rather closely certain forms of *A. petiolatus* (Kr.) but differs in the following characters :—(1) there are no tubercles on the lateral processes ; (2) the ocular tubercle is very tall, exceeding in length the neck or anterior process of cephalon which carries it ; (3) the “ knife-edge ” occupies more than half the ventral edge of the propodus.

Schimkewitsch (1889, p. 343) has recorded *A. petiolatus* (under the name of *P. longicolle* Dohrn) from the West Coast of Patagonia (Lat. 45°S.). In view of the extent of variation implied in the synonymy which Norman (1908, p. 202) gives for this species, I hesitate, on the evidence of a single specimen, either to extend the range of *A. petiolatus* to Burma or to establish a new and very closely-allied species.

Genus **Endeis** Philippi.

Calman, 1915, p. 48.

= *Phoxichilus*, auctt. plur.

Species of *Endeis* appear to be among the commonest Pycnogonida in shallow water and between tide-marks on the coasts of India. Ten lots of specimens are in the Indian Museum collection and I have also examined a large gathering from Christmas Island and the single specimen of *E. mollis* recorded by Carpenter from the Maldives. These specimens can be sorted with comparative ease into three groups which are here designated as species but which differ, for the most part, only in the degree of development of the spines on the body and legs. Other characters, such as the relative proportions of the proboscis and body, the distance between the lateral processes, and the form and armature of the foot, vary a good deal without affording a basis for specific separation.

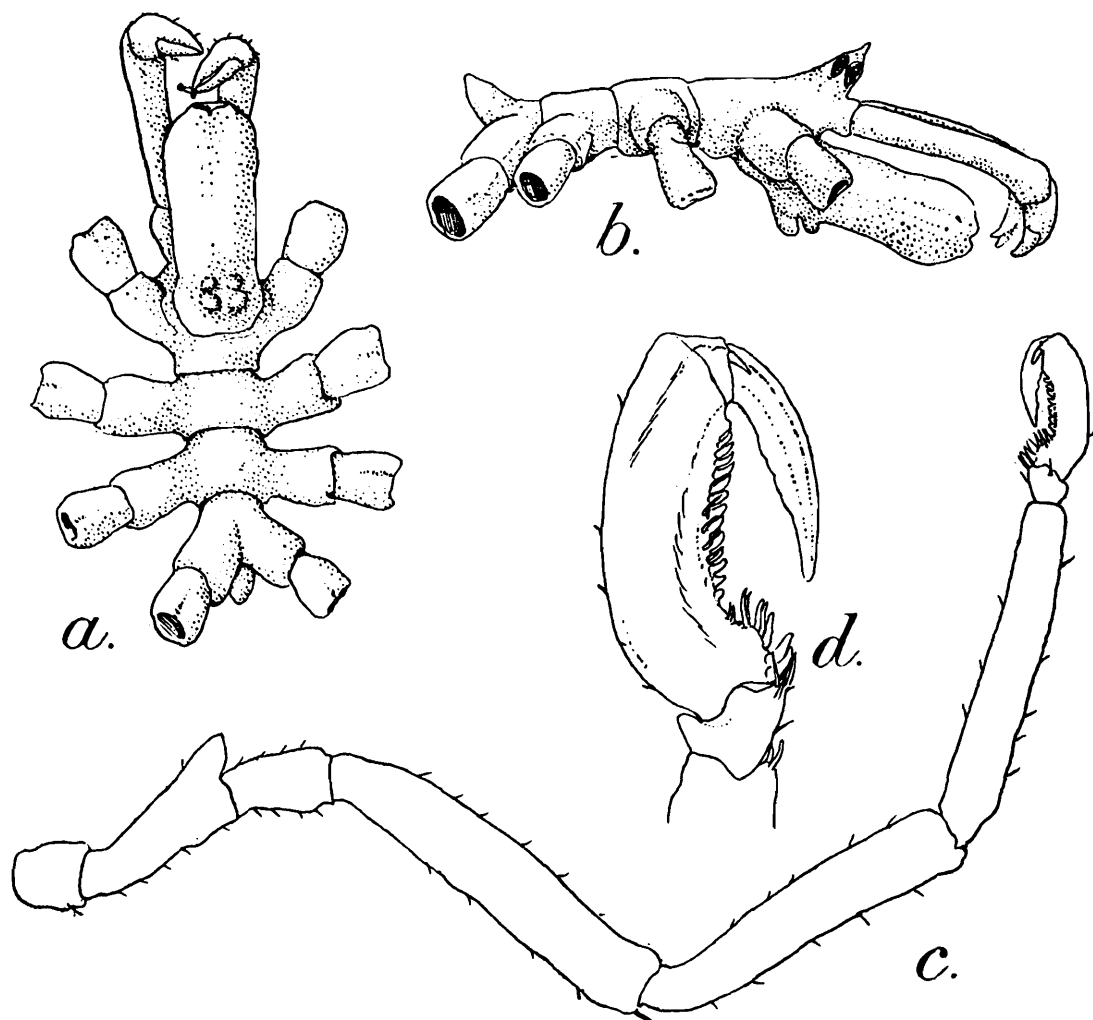


FIG. 14.—*Anoplodactylus investigatoris*, sp. n. Female. a. Ventral view, legs omitted. b. Lateral view. c. Third leg of left side. d. Propodus of third leg.

In all the species here considered, as in the European *E. spinosus* (Montagu) and *E. charybdaeus* (Dohrn), the base of the proboscis is encircled by a collar which is most prominent on the dorsal side. Two curved grooves, probably always present although sometimes hard to see, mark off from this collar a pair of dorso-lateral lobes, within each of which a more transparent area appears to indicate the "excretory organ" described by Dohrn as corresponding to the missing palp.

Behind the collar a pair of papillae can be detected, representing, according to Dohrn, the vestigial chelophores. The structures which Loman figures (1908, pl. xi, figures 151 and 154) as vestigial chelophores in *E. procerus* and *E. meridionalis* are, apparently, the lateral lobes of the collar.

The antarctic *E. australis* (Hodgson) is distinguished by the absence of the collar (Calman, 1915, p. 49, fig. 11) as well as by the presence of eight instead of seven segments in the oviger (Bouvier, 1913, p. 119, fig. 74). In the latter character, but not, apparently, in the former, it agrees with *E. clypeatus* (Möbius). The remaining species of the genus are only to be discriminated by trivial and variable characters and it is not surprising that Carpenter (1904, p. 182) even doubted whether it would be possible to maintain specific distinctions within the genus.

Bouvier (1917, p. 31) points out that *E. charybdaeus* (Dohrn) differs from *E. spinosus* (Montagu) and agrees with *E. meridionalis* (Böhm) in having the second tibia longer than the femur. In this particular nearly all the Indian specimens agree with *E. meridionalis*. They agree also with *E. mollis* (Carpenter) in having the penultimate segment of the oviger expanded laterally, although the expansion is not quite so marked as it appears in Carpenter's figure.

***Endeis meridionalis* (Böhm).**

(Text-fig. 15.)

Phoxichilus meridionalis, Böhm, 1879, p. 189, pl. ii, figs. 4—4b; Loman, 1908, p. 78, pl. xi, figs. 153—155.

Localities.—"Madras. On buoys and in net hauled in harbour, close to eastern end. (*S. W. Kemp*)."
1 ♀.

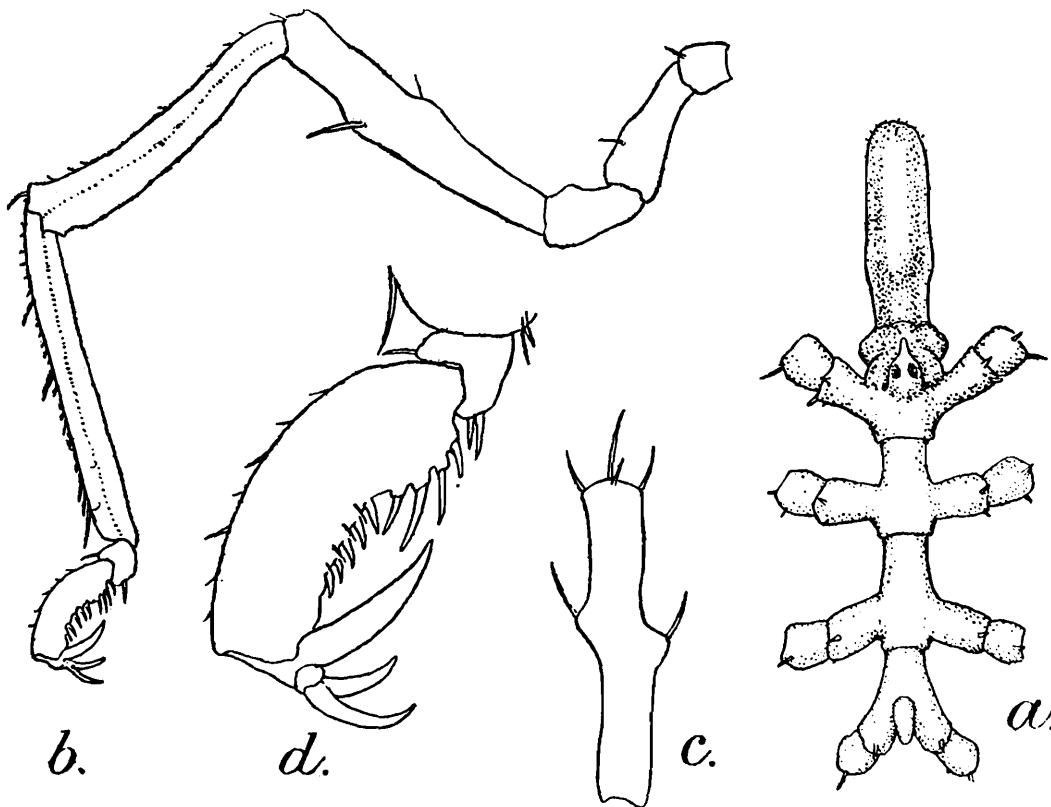


FIG. 15.—*Endeis meridionalis* (Böhm). Female, from Christmas Island. a. Dorsal view, legs omitted. b. Third left leg. c. Dorsal view of femur. d. Propodus.

["Christmas Island. On piles of pier, Flying Fish Cove, 1908. C. W. Andrews. B. M. Reg. No. 1909.5.19. 325—329." About 40 specimens.]

Description.—*Body* moderately extended, the lateral processes separated by at least twice their diameter; two teeth or sharp tubercles on first lateral processes, one on each of the others. Proboscis little wider at tip than at base. Ovipositor with penultimate segment expanded and armed with recurved spines. Legs rather stout, well armed with spines; first coxa with a dorsal tooth and a posterior spine which is large in the first pair and small in the others; second coxa with a posterior spine which also is much larger in the first pair; femur, seen from above, distorted by swellings bearing the large lateral spines, of which the anterior is longer, sometimes much longer, than the diameter of the segment, and the posterior little, if at all, shorter; three of the distal spines of both the femur and the first tibia very large; second tibia longer than femur. Cement glands in femur of male about 23, in a single row.

Measurements of female, in mm.

Length of proboscis (to collar)	...	...	...	1.4
" body	...	...	...	2.76
Width across 2nd lateral process	...	...	...	1.0
" between 2nd and 3rd lat. processes	...	...	...	0.3
Diameter of 2nd lateral process	...	...	...	0.28
Interval between 2nd and 3rd lat. processes	...	...	...	0.56
Third left leg :—				
First coxa	...	...	...	0.32
Second coxa	...	...	...	0.88
Third coxa	...	...	...	0.48
Femur	...	...	...	2.0
First tibia	...	...	...	1.8
Second tibia	...	...	...	2.24
Tarsus and propodus	...	...	...	0.92

Remarks.—The spinulation of the leg in our specimens, more especially in those from Christmas Island, resembles Böhm's figure so nearly as to suggest identification with his species. His specimen, however, was a good deal larger and had the legs nearly three times instead of little more than twice as long as the body and proboscis. Further, the surface of body and limbs is described as "mit perlartigen Wärrchen dicht besetzt." Possibly this refers to the appearance of granulation produced, when the cuticle is very thick, by the canals of the dermal glands. In our specimens the cuticle is thin and the canals inconspicuous. Bouvier's suggestion (1917, p. 31) that the species might be distinguished by the strongly curved propodus and the length of the claw appears to rely too much on the accuracy of Böhm's figures. Loman (1908, p. 78) comments on the varying characters of the specimens he referred to this species. His figure 155 on pl. xi represents a large distal process of the femur very different from what is found in the specimens here discussed. The presence of as many as 40 cement glands may have been due to the large size of the specimen examined by him, but they are stated to have been arranged in two rows.

While it is improbable that Böhm's holotype agreed exactly with any of the specimens that I have examined, it seems reasonable to give his

name to the more spiny forms from the Indian region and I propose to restrict it to those that have the femur markedly distorted, with lateral spines at least as long as the diameter of the segment.

The numerous specimens collected by Dr. Andrews at Christmas Island show some differences in the length of individual spines but they have unmistakably a common facies which made it easy to sort them out from specimens of the following species with which they were mixed.

The single specimen from Madras Harbour is rather less spiny than those from Christmas Island but it differs chiefly in its very thin and flabby cuticle; this might be attributed to a recent moult were it not that all the specimens of *E. flaccidus* (v. infra) from the same locality have the same character.

***Endeis mollis* (Carpenter).**

(Text-fig. 16.)

Phoxichilus mollis, Carpenter, 1904, p. 182, plate, figs. 1-7; Carpenter, 1907, p. 98.

Localities.—"Tongatabu. 3269/7" 1 ♀.

"3283/9. Lat. 6° 0' N., Long. 81° 16' E. 34 fathoms. 25th April, 1888. (*J. Wood-Mason*.)" 2 ♂, 1 ♀.

"Sta. 148. In Lagoon of Northern Maldivé Atoll, 15—30 fath. Marine Survey." 1 ♂.

"Muscat, Arabia. 5th November, 1918. (*H. J. Walton*.)" 1 ♂.

"N. Cheval Paar, Ceylon. November, 1910. (*T. Southwell*.)" 2 ♂.

"Kilakarai, Ramnad Dist., Gulf of Manaar. From Weeds, 0—2 fathoms. 15th—20th February, 1913. (*S. W. Kemp*.)" 1 ♂.

"Madras. (*K. Ramuni Menon*.) 7295/10." 2 ♂, 3 ♀.

"Nancowry Harbour, Nicobar Islands, Marine Survey, Sta. 614. Surface. (*Major R. Seymour Sewell*.)" 1 ♂.

["Christmas Island. On piles of pier, Flying fish Cove, 1908, C. W. Andrews. B. M. Reg. No. 1909. 5.19.330—334." About 20 specimens.]

["Hulule, Maldivé Islands. 'Sealark' Expedition. B. M. Reg. No. 1908.1.6.9." 1 ♀.]

Remarks.—I have included under this name specimens showing considerable diversity. While agreeing in most characters with the specimens assigned above to *E. meridionalis* they have the femur straight or nearly so, its lateral spines much shorter than the diameter of the segment, and the other spines of the body and limbs greatly reduced in size and in number. Some of the specimens, such as those from North Cheval Paar, agree very closely with Carpenter's original description and figures. Others have the body more elongated, like the specimen from Hulule, Maldivé Islands, which Carpenter himself referred to this species, and the very large male (total length 7.6 mm.) from Muscat. The latter specimen is very smooth, with the legs relatively very long, approaching, though they do not reach, the proportions found in *E. procerus* (Loman);

the number of the femoral cement glands is about 40 as against 24 in the type of the species. The specimen from Tongatabu has the femora distinctly distorted, approaching *E. meridionalis*, from which it is mainly distinguished by the feeble development of the spines. Perhaps the most aberrant form is that represented by the specimen from Kilakarai (Text-fig. 16) with which those from Madras and from Nancowry Harbour are in general but not complete agreement. This form is very smooth, hardly even the most minute spines being present on the body and proximal segments of the limbs. There are three spine-bearing tubercles

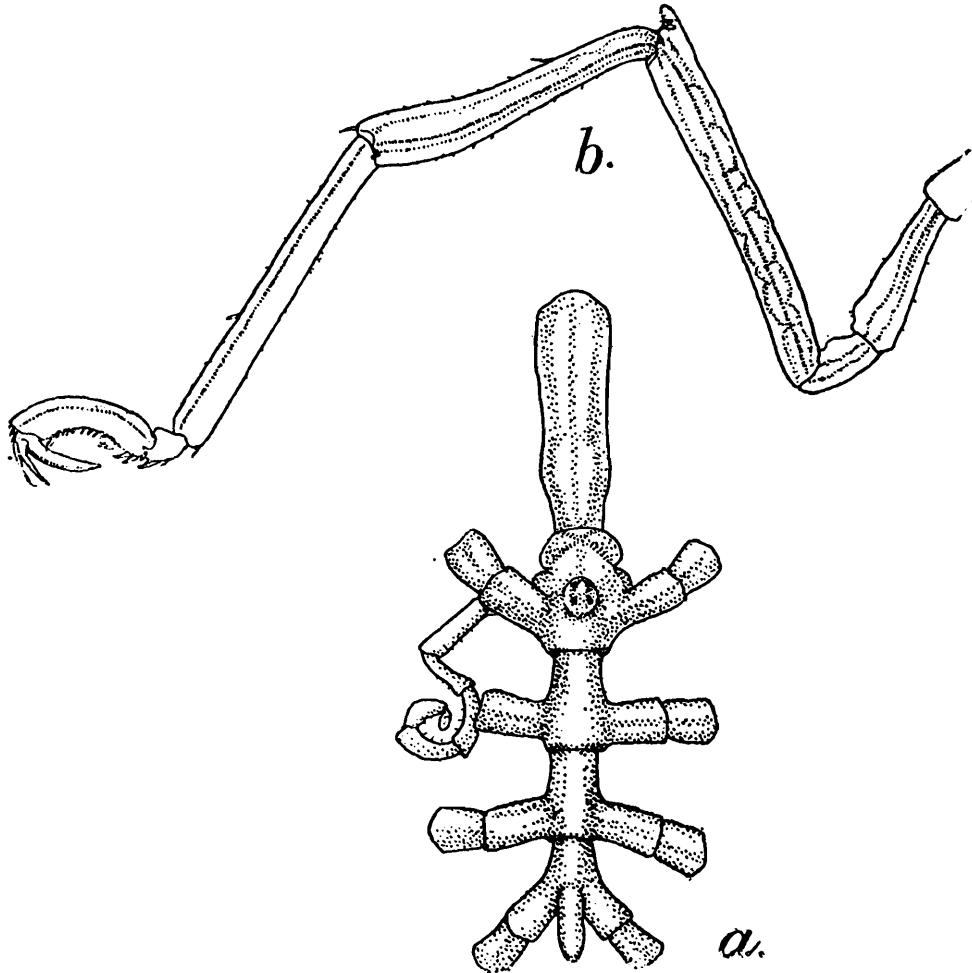


FIG. 16.—*Endeis mollis* (Carpenter). Male, from Kilakarai. *a.* Dorsal view, legs omitted. *b.* Third leg of left side.

at the distal end of the femur, the dorsal one being very prominent, much as in Loman's figure of what he regards as *E. meridionalis* (Loman, 1908, pl. xi, fig. 155). The second tibia is usually a little shorter than the femur, although it may be equal to it or even slightly longer in one or other of the legs of the same specimen. The femoral cement glands were unusually difficult to count but there appeared to be about 25.

The specimen from Nancowry Harbour, Nicobar Islands, is recorded by Major Seymour Sewell to have been taken by the tow-net along with the immature specimen of *Ascorhynchus* sp. mentioned above. The occurrence of a species of *Endeis* under these conditions is noteworthy since Miss Lebour (1916) has stated that young specimens of *Endeis spinosus* are occasionally found clinging to medusoids at Plymouth.

***Endeis flaccidus*, sp. nov.**

(Text-fig. 17.)

Phoxichilus sp. Loman, 1908, p. 79, pl. xiii, fig. 189.*Localities*.—"Madras. Springhaven, on buoys and piles at northern end. (*S. W. Kemp.*)" 9 specimens."Madras. Springhaven, on piles at northern end. (*S. W. Kemp.*)" 1 ♀."Madras Harbour. January, 1921. (*S. G. Manavala Ramanujam.*)" 8 specimens.

Description.—*Body* rather contracted, the lateral processes separated by less than their diameter; no teeth or conspicuous spines on the lateral processes. Proboscis hardly wider at tip than at base. Ovipiger with penultimate segment expanded and armed with recurved spines. Legs rather stout; first coxa with a dorsal spine, second coxa with only inconspicuous spines and setae; femur, seen from above, nearly straight, with very small lateral spines, one of the distal spines larger; no marked distal prominences; second tibia slightly longer than femur.

Femoral cement glands of male about 57, scattered irregularly in a broad band along the length of the femur (fig. 17*e*.)

Exoskeleton unusually thin, flaccid and transparent, allowing the internal organs to be clearly seen. The diverticula of the alimentary canal in the legs give off, along the whole of their length, short digitiform or simply branched caeca (fig. 17 *d* and *f*).

Measurements of female in mm.

Length of proboscis (to collar)	...	...	...	1.52
" body	...	...	...	2.08
Width across 2nd lateral processes	...	...	...	1.2
" between 2nd and 3rd lat. proc.	...	...	...	.36
Diameter of 2nd lateral process	...	...	...	.28
Interval between 2nd and 3rd lat. proc.	...	...	...	.24
Third left leg :—				
First coxa	...	...	...	0.32
Second coxa	...	...	...	1.0
Third coxa	...	...	...	0.6
Femur	...	...	...	2.2
First tibia	...	...	...	1.8
Second tibia	...	...	...	2.28
Tarsus and propodus	...	...	...	1.0

Remarks.—Except in its rather abbreviated body, this species does not differ conspicuously in external characters from some of the smoother forms referred above to *E. mollis*. It differs from all of them, however, in the fact that the cement glands are not uniserial and that the alimentary diverticula are provided with numerous caecal branches. In the latter character it agrees with the specimen mentioned by Loman (1908, p. 79, pl. xiii, fig. 189) and dredged by the "Siboga" off the island of Sumbawa.

Loman gives very few particulars regarding this specimen but he states that it was "durchsichtig und schlaff, wie eben gehäutet." The specimens now recorded, however, all have the cuticle thin and transparent, suggesting that the character may be specific and not temporary.

Even in species of *Endeis* where the cuticle is comparatively thick it is fairly easy to see the outline of the alimentary diverticula in the legs

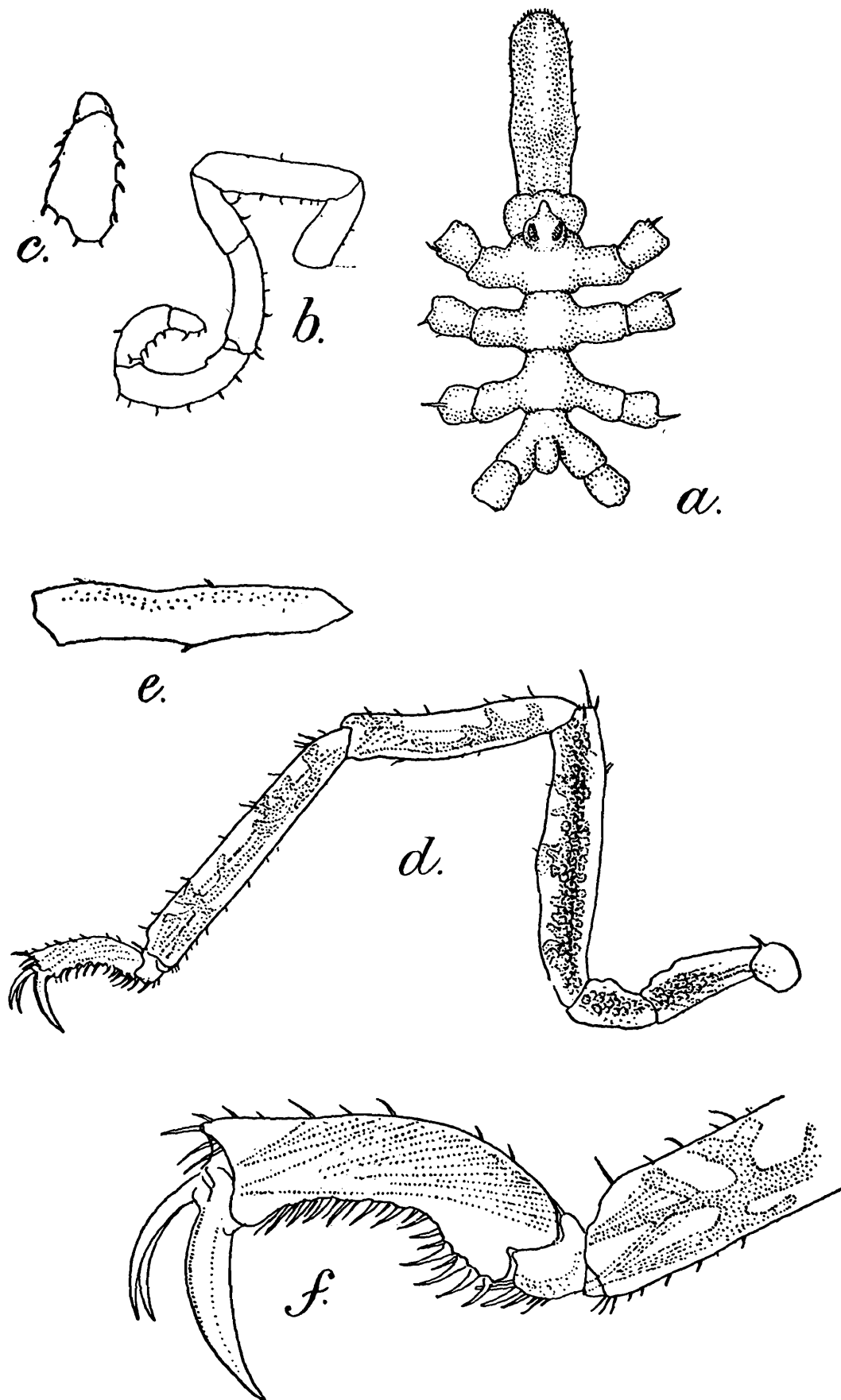


FIG. 17.—*Endeis flaccidus*, sp. n. a. Dorsal view of female, legs omitted. b. Oviger of male. c. Terminal segments of same. d. Third left leg of female. e. Dorsal view of femur; dots indicate openings of cement glands. f. Terminal part of leg further enlarged.

and they are certainly devoid of accessory caeca in all the other specimens I have examined. Loman mentions as a possibility that the presence of these caeca in his specimen might have been due to the presence of some parasite, but there is no evidence that this is the case.

So far as I know, the only structures resembling these caeca in any other Pycnogonid are the "secundäre Blindsäcke des Darmes und seiner Schläuche" in *Pycnogonum littorale* mentioned by Dohrn (1881, p. 39) and before him, as "drüsige Anhänge," by Zenker (1852, p. 387). They have never been figured and the specimens at present available to me for dissection are too ill-preserved to show them.

The femoral cement glands are arranged in a single row in all the other species in which I have been able to see them distinctly, but Loman's statement that they were present in two rows in specimens which he referred, perhaps wrongly, to *E. meridionalis*, suggests that some other species may have them arranged as in *E. flaccidus*.

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ON A NEW SPECIES OF LINGUATULID FROM PALESTINE.

By M. L. HETT, B.Sc., *Professor of Biology, Lady Hardinge Medical College, Delhi.*

Several specimens of Linguatulids were sent to me for examination by the Director of the Zoological Survey of India, Calcutta, in February 1923. Among them were some belonging to a new species which I have placed provisionally in the genus *Raillietiella*. As in the other members of this genus, the mouth is terminal, the hooks surrounded by fleshy protruberances, and the genital aperture appears to be anterior in the female as well as in the male ; but, unlike the hitherto described species of *Raillietiella*, the female is spirally coiled and in both sexes there is a narrow wing-like lateral expansion on each side of the body.

***Raillietiella spiralis*, sp. nov.**

There were three specimens :—

- (a) a mature female specimen,
- (b) a damaged specimen—apparently the anterior half of a female,
- (c) a smaller specimen—either a male or an immature female, probably the former.

(a) This specimen is spirally coiled, the posterior part of the body forming two complete turns. Uncoiled, the entire length would be about 20 mm. ; width of head 1.5 mm. The centre of the body is cylindrical but there are two narrow wing-like expansions on either side extending from a point just behind the cephalothorax to the extreme posterior end. There is a slight narrowing of the body between the cephalothorax and the abdomen but, except for this constriction, the diameter of the body is fairly uniform, only decreasing to a small extent posteriorly. The mouth lies at the extreme anterior end ; the armature is thimble-shaped. The hooks are single and sharply curved, the anterior pair well in advance of the posterior and slightly closer together. Each hook is surrounded by small fleshy protruberances and there are also a pair of prominent soft projections from the dorso-lateral aspect of the cephalothorax—probably dorsal papillae.

It was not possible to determine the position of the genital aperture with absolute certainty, but there is an anterior depression guarded by a papilla which I have little hesitation in describing as such. The posterior extremity is bifid but the characteristic flattened projections on either side of the anus are scarcely developed : it bears more resemblance to the posterior end of *Porocephalus teretiusculus*. This, however, is scarcely a diagnostic character as I have found a good deal of variation in this respect among undoubted specimens of *Raillietiella*.

The rings are difficult to count but there are about 60.

The cuticle has a dotted appearance, but whether this is due to numerous stigmata or to an irregular surface I could not determine.

The specimen is a mature female ; the body is slightly distended and eggs can be seen in the uterus.

(b) The head of the damaged specimen resembles that of (a), but the body is only half the length and not spirally coiled ; probably the coiled portion has been broken off. It is almost certainly a female specimen because there are two large oval structures visible through the semi-transparent body-wall, just behind the cephalothorax, which are apparently spermathecae.

(c) The smaller specimen is curved but not coiled. Length 13 mm. Rings 60 to 70. At first sight this appeared to be of a different species, as the cephalothorax is only about half the width of the abdomen. But on closer examination it is quite evident that the cephalothorax of this specimen closely resembles that of the larger individuals and that the characteristic wing-like expansions are present in the abdominal region. The difference in shape is probably due to the distension of the body by the eggs in the uterus of the mature female ; this swelling renders the body more cylindrical and therefore narrower. An immature specimen or a male is flatter and thus appears more expanded in the abdominal portion.

It is not always easy to distinguish an immature female *Raillietiella* from a male specimen since the genital aperture is anterior in both sexes. I am inclined to think that the specimen in question is a male because in those Linguatulids where the female is spirally coiled while the male is not, the female generally shows some signs of torsion at an early stage, and there is no such tendency in this specimen.

The specimens were taken in the lung of a snake (*Coelopeltis monspessulana*) at Khan Junis in Southern Palestine by Major R. B. Seymour Sewell, I.M.S., in March, 1917.

The only other Linguatulids in which wing-like expansions of the lateral body-wall are found belong to the genus *Linguatula* ; but here the expansions are very much more prominent and the species above described differs from species of *Linguatula* in almost every other particular. The general appearance of the expansion, as viewed by transmitted light, gives the impression that it does not contain an extension of the body cavity, the dorsal and ventral walls having coalesced in this region ; this, however, cannot be established without dissection. This peculiar structure marks the species off from all the other species of *Raillietiella* but, as on the other hand all the characteristic features of the genus are present, I feel that it should be included in this group, and I have therefore named it *Raillietiella spiralis*.

A NEW INDIAN DROSOPHILID FLY

By E. BRUNETTI.

***Drosophila prashadi*, sp. nov.**

The present species appears allied to *D. ananassae* Dol. and *D. hirticornis* de Meij.

It differs from *hirticornis* by the arista generally possessing only three long bristly hairs on the upper side (sometimes four), and only one on the underside, this latter placed a little beyond the middle. The tip of the 3rd antennal joint does not nearly reach the mouth opening; the 3rd and 4th longitudinal veins are quite parallel; the last segment of the 5th vein (de Meijere's 4th) is about equal to the distance between the cross-veins (and not over $1\frac{1}{2}$ times as long). Dr. deMeijere evidently regards the 1st longitudinal vein as present and the 2nd as absent whereas it seems to me that the vein present is the 2nd longitudinal, since the anterior cross-vein must separate the 3rd and 4th veins. This will account for the difference in the readings.

From *ananassae* the present species differs mainly by the transverse black bands on the hind margins of the abdominal segments, varying in width from occupying nearly half the segment to their total absence. Doleschall's species has the abdomen mainly rather dark, brownish to blackish brown, so the two forms cannot be conspecific. Doleschall's description is valueless, as noted by Osten Sacken, but deMeijere re-describes the species from a large number of specimens from Java, collected on cut fruit, sent by Jacobson and apparently obtained from (or possibly named by) Doleschall himself.

The following notes on the present species may be useful. 3rd antennal joint greyish, with short pubescence, bearing several short bristles of varying length: arista dark, cylindrical, not pointed at tip; the black bristly hairs it bears may number 2 (possibly one missing), 3 or 4, in the latter case the 3rd and 4th are generally smaller and rather unsymmetrically placed. The number does not seem constant as two specimens have five bristly hairs above and three below, all long and distinct. Whole body pale brownish yellow, the hind margins of the abdominal segments more or less narrowly black, the colour sometimes extending to the middle of the segment, and being sometimes hardly visible or quite absent. These bands are most conspicuous in the ♂. Chaetotaxy: one pair ocellar bristles directed forwards, one pair of nearly erect vertical ones just behind ocellar triangle, three distinct bristles near upper corner of eye, the innermost and outermost converging, the middle one strongly divergent; the outermost is obviously post vertical, the other two vertical, though the innermost might possibly be considered as the 1st fronto-orbital. 2 fronto-orbital (apart from the one just mentioned) placed on upper part of frons, and an additional bristle alongside the lower one, also some minute bristly hairs on lower part of cheeks towards sides. 3 distinct oral bristles on each side of

mouth opening, with 3 or 4 others in addition to smaller ones on lower part of cheeks. Thorax with 2 dorso-central on hinder part ; 2 humeral, 1 post humeral, 1 post sutural, 1 supra alar and 2 others which appear to be notopleural. Scutellum with a basal pair, placed on upper corners and the usual apical pair.

Type.—Number $\frac{5710}{H. 2}$ in the collections of the Zoological Survey of India, Indian Museum, Calcutta.

[The above description is based on a large series of specimens bred in the laboratories of the Zoological Survey of India, Indian Museum, Calcutta, in November 1920. The flies were made to lay eggs on two bananas left exposed in a petri-dish. This was later covered by a bell-jar. In about a fortnight the flies began to appear in fair numbers and a few days later the whole jar was absolutely full of them. The importance of this fly lies in the fact that it is liable to be confused with the Phorid fly *Aphiochaeta xanthina*, Speiser (described as *A. ferruginea* by Brunetti), which also breeds on bananas and causes myiasis in man. *B. Prashad.*]

A REVIEW OF THE INDIAN SPECIES OF THE GENUS
OLIGODON SUPPRESSING THE GENUS *SIMOTES*
(*OPHIDIA*.)

By F. WALL, Colonel, C.M.G., I.M.S.

Last year at my request all the available specimens of *Simotes* and *Oligodon* in the Indian Museum were submitted to me for study, also all those available in the Bombay Natural History Society's collection. I also had an opportunity while in England of examining some of the specimens in the British Museum. To notes from this material I have added notes from the many scores of specimens examined in smaller museums and of my own collecting. I propose in the following paper to review this genus and put on record all that is known of the various species up to date.

In a previous paper (*Journ. Bombay Nat. Hist. Soc.*, XIX, p. 556, foot-note) I showed from a study of skulls in my collection that Duméril and Bibron had established a genus *Oligodon* distinct from *Simotes* on the erroneous observation that species to which they applied the generic title *Oligodon* had no teeth in the palate. Later Boulenger discovered that some of these had palatine teeth, but he retained the genus as distinct from *Simotes* on the erroneous assumption that these same species had no pterygoid teeth. All those whose skulls I have prepared, except doubtfully *templetoni*, have pterygoid teeth so that the grounds for separating *Oligodon* from *Simotes* on dentition do not exist.

As *Oligodon* has priority (1827) over *Simotes* (1853) the former title must be retained to designate the whole.

A study of the genitalia show that there are two very different varieties to be met with among the species, and it is possible the genus, as now represented, may be divided hereafter on this basis.

However, as I have genitalia of only four species, it is wisest provisionally to let them all remain under the one generic title *Oligodon*.

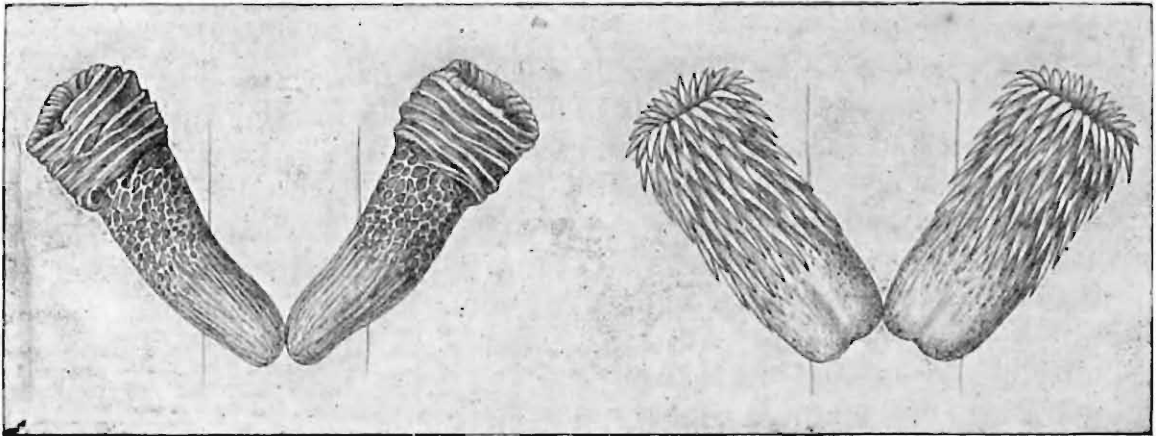
IDENTIFICATION.—Distinctive as are all the species of this genus, there is no easily defined guide to their recognition. The following associated characters concerning lepidosis appear to me to afford the most important basis for identification. *Rostral*. In the median line the portion visible from above is twice or more than twice the length of the suture between the internasal fellows (except in *cruentatus* and *theobaldi*). *Internasals*. In species where two are present, as is usually the case, the suture between them is half or less than half the internaso-præfrontals. *Frontal*. As long as the parietals (except in *cruentatus* and *theobaldi*). *Temporals*. Two shields border the parietals, the posterior subequal to, or longer than, the anterior (except in *splendidus* where three border the parietals). *Infralabials*. The last of the series (the 4th or 5th) is as long as, and rather broader than the posterior sublinguals, and touches only two scales behind.

HABITS.—Terrestrial. Diurnal. Active. Courageous.

FOOD.—Chiefly lizard's (or snake's) eggs and frog's spawn. Sometimes small mammals, lizards, and other reptiles.

BREEDING.—Oviparous in all the species whose habits I have investigated.

The male genitalia vary in the species here included in one genus, and it is possible that this variation may be used as a basis for a subdivision of the genus into two. I have dried genitalia of four species in my collection. In *taeniolatus* and *sublineatus* the organ is relatively small, cylindrical and beset with recurved cartilaginous processes from base to extremity, just as one sees in so many other species of the Colubridæ. In *albocinctus* and *juglandifer*, however, the organ is relatively very large, cylindrical, and increases in girth from base to extremity, being cleft at the extreme tip. There are no recurved processes. The proximal third has feeble longitudinal rugae, the middle third a honeycomb network of rugae, and the distal third concentric and somewhat imbricate rugae (see figures).



A

A Genitalia of *Oligodon albocinctus* ($\times 2$).B " " *sublineatus* ($\times 5$).]

B

LEPIDOSIS.—For Indian species. *Rostral*. Touching six shields (eight in *splendidus*). Portion visible above as long as or nearly as long as its distance to the frontal. *Internasals*. A pair. (Absent in *brevicauda* and *herberti*, four in *splendidus*. Separated by the rostral in *planiceps*.) *Praefrontals*. A pair. *Frontal*. Touching six shields. Length greater than its distance to the end of the snout (except in *cruentatus*, where it is subequal or less); equal to or almost equal to the parietals (two-thirds to three-fourths in *theobaldi* and *cruentatus*). *Nasals*. Entire, semidivided, or divided. *Loreal*. Present or absent. *Praeocular*. One. *Postoculars*. Two. (One in *herberti*, *mcDougalli* and *dorsalis*.) *Temporals*. 1 + 2, or 2 + 2, well developed (small and hardly differentiated in *splendidus*). Two border the parietals, the posterior being as long as or longer than the anterior (except in *splendidus*, where three border the parietals). Two shields between the parietals and the last supralabial (except in *splendidus*, where there are three). *Supralabials*. Usually 7 or 8. 4 in *planiceps*, 6 in *herberti*, *melanozonatus*, and *woodmasoni* (where the 3rd is divided into an upper and lower part) and in *violaceus*, *purpurascens*, and *splendidus*, where the 4th is similarly

divided. Two touching the eye (except in *planiceps*, where only the 3rd touches). *Infralabials*. 4 or 5. The last as long as, or longer than the posterior sublinguals, as broad or broader than those shields, touching two scales behind. *Sublinguals*. Two pairs, the posterior shorter than the anterior. Two or three pairs of scales between the posterior and the 1st ventral.

OSTEOLOGICAL CHARACTERS.—*Skull. Praemaxilla*.—Broader than high. *Nasals*. Whole breadth of posterior border forming a ligamentous suture with the frontals. *Praefrontals*. The suture with the frontal equal to the orbital rim of the frontal. *Frontals*. Longer than broad, slightly constricted opposite the middle of the orbit. Contributing about one-third to two-fifths to the orbital rim. *Postfrontal*. Touching the frontal in some species, not in others. *Parietal*. Contributing a little to the orbital rim in some species, nothing in others. *Supratemporal*. Projecting beyond the quadrate. *Maxilla*. Projecting beyond the palatine anteriorly, and posteriorly. As long as the dentary. Teeth 6 to 16; much compressed; anododont, syncranterian, strongly coryphodont. With or without an edentulous space anteriorly. *Ectopterygoid*. Rather shorter than the maxilla. *Palatine*. Slender; teeth 0 to 10; anododont, isodont or feebly kumatodont. With or without an edentulous space anteriorly. *Pterygoid*. Teeth 1 to 23 (? none in *sublineatus*). Anododont, kumatodont. With or without an edentulous space anteriorly. *Mandible*. Angular present. Sphenoid present. Coronoid absent. Dentary about as long as its distance to the quadrate. Teeth 6 to 20; anododont, feebly kumatodont. With or without an edentulous space anteriorly. *Quadrate*. About as long as its distance to the orbit. Oblique from above backwards. *Columella auris*. Short, ending in cartilage which is attached to about the middle of the quadrate.

Vertebrae. Neural spines.—Wanting on the atlas. On the axis as long as the body. On the 3rd somewhat oblique backwards. On the succeeding vertebrae the depth is about three-fourths the body, length rather shorter than the body. *Hypapophyses*. On the atlas a small tubercle. On the axis bifid, the posterior part oblique backwards. Well developed in succeeding vertebrae, disappearing in the anterior part of the second eighth of the body, where they are replaced by a shallow, even ridge. Bifid to form two laterally disposed laminæ on the 2nd and succeeding caudal vertebrae.

Costae.—1st rib articulated to the 3rd vertebra, rather shorter than the 2nd. Penultimate bifid, the outer ramus about one-fifth the inner. Ultimate bifid, the outer ramus about two-thirds the inner.

Pseudo-costal processes.—Bifid to form outer and inner rami on the first three caudal vertebrae, single in succeeding vertebrae.

Oligodon planiceps (Boulenger).

Simotes planiceps, Boulenger, *Cat.* II, 1894, p. 232.

COLOUR.—Pale brown dorsally, some of the scales with blackish lower borders. A blackish bar behind the parietal shields. A black oblique subocular streak. Ventrally white (pinkish, Boulenger), with lateral, squarish, black spots, usually in pairs.

FOOD AND BREEDING.—Nothing known.

GROWTH.—Maximum Length. 130 mm. ($5\frac{1}{4}$ inches.) Tail 15 mm. ($\frac{3}{5}$ of an inch).

LEPIDOSIS.—As detailed in the synopsis. *Rostral*. Entirely separating the internasals, and partially separating the præfrontals. In the specimen in the Indian Museum the supralabials are 4. The 4th is a very long shield and possibly a confluence of two.

DISTRIBUTION.—*Burma*. The type is from Minhla, Burma (Lat. 20° Long 95°). Another specimen in the Indian Museum killed on the Yunnan Expedition is dubiously from Upper Burma or Yunnan.

***Oligodon herberti* Boulenger.**

O. herberti, Boulenger, *Bomb. N. H. J.*, XVI, p. 235.

TYPE.—In the British Museum, from Mogok, N. Shan States, Burma.

COLOUR.—Dark grey dorsally. A buff, black-edged vertebral stripe involving the vertebral and upper half of the next row from the nape to the tip of the tail, and constricted at intervals to form elongate spindle-shaped segments. An ill-defined, blackish line on the confines of the second and third rows above the ventrals, and ending at the vent. Ventrally whitish (orange-red, Boulenger) with squarish, black, lateral spots, usually on alternate shields. Head with an indistinct præfrontal blackish bar, re-appearing below the eye, and an ill-defined blackish bar on the parietals, sending forward an angular process to the frontal, behind which is a buff oblique bar on the neck, separated from its fellow ventrally.

FOOD AND BREEDING.—Nothing known.

GROWTH.—Maximum Length. 560 mm. (1 foot, 10 inches).

LEPIDOSIS.—As detailed in the synopsis.

DENTITION.—Maxillary. 7 ? with an edentulous space anteriorly.

DISTRIBUTION.—*Burma*. Mogok, N. Shan States. Sinlum Kaba (Lat. 24° Long $97^{\circ}5$). 6,000 ft. (Bombay colln.)

NOTE.—I have seen four specimens.

***Oligodon mcdougalli* Wall.**

O. mcdougalli, Wall, *Bomb. N. H. J.*, XVI, p. 251.

TYPE.—From Sandoway, in the Bombay Natural History collection.

COLOUR.—Dusky black dorsally with a rufous-brown, vertebral stripe from the nape to tail tip, bordered interruptedly with black and involving the vertebral and half the next row. A linear black line on the confines of the 2nd and 3rd rows above the ventrals, interrupted anteriorly and ending at the vent. A supra-anal and a subterminal caudal black bar. Ventrally black mottled with fawn. Tail beneath black laterally, and crimson centrally. Head blackish. Rostral rufous yellow blotched with black below. Labials mottled black and rufous-yellow. A rufous collar, incomplete on the nape.

FOOD AND BREEDING.—Nothing known.

GROWTH.—Maximum Length. 350 mm. (1 foot, $1\frac{3}{4}$ inches).

LEPIDOSIS.—As detailed in the synopsis.

DISTRIBUTION.—*Burma.* Sandoway.

NOTE.—Known from a single specimen.

***Oligodon torquatus* (Boulenger).**

Simotes torquatus, Boulenger, *Cat.* II, 1894, p. 232.

COLOUR.—Dorsally brown with or without four indistinct longitudinal stripes. The anterior superior edge of the 3rd row above the ventrals, and both anterior edges of the superjacent rows with a whitish speck. Ventrally white with a few irregularly disposed black spots on a few shields before the vent. Tail immaculate beneath. Head with obscure blackish marks. A more or less distinct blackish bar behind the parietals. A subocular blackish streak.

FOOD.—Nothing known.

BREEDING.—A gravid ♀ killed at Myitkyina by Captain Venning on the 1st of May 1911 was sent to me which was found to contain two (dubiously three) eggs. One of the eggs was protruding from the cloaca proving that the species is oviparous. No mention was made of any eggs already discharged.

GROWTH.—Maximum Length. 292 mm. ($11\frac{1}{2}$ inches). Tail 37 mm. ($1\frac{1}{2}$ inches).

LEPIDOSIS.—As detailed in the synopsis.

DENTITION.—As detailed in the synopsis. I have two skulls in my collection.

DISTRIBUTION.—*Burma.* Hills between Lat. 24° and 26° , and East of Long. 96° Bhamo. Myitkyina.

NOTE.—I have seen four specimens including the types.

***Oligodon erythrorhachis* Wall.**

O. erythrorhachis, Wall, *Bomb. N. H. J.*, XIX, p. 923.

TYPE.—From Jaipur, Assam, in the British Museum.

COLOUR.—Dorsally pale grey with a powdering of black, giving a dark grey effect extending to the edges of the ventrals. A conspicuous red vertebral stripe from the nape to tail tip, involving the vertebral and next one and a half rows, 29 narrow, black, light-edged cross bars on the body and 7 on the tail. Ventrally white with square black lateral spots in the whole length. A pinkish suffusion in the middle from tail tip, disappearing in the fore-body. Head with a blackish transverse bar across the præfrontals, reappearing below the eye. A broad oblique black temporal streak. An elongate, black, median arrow head on the nape with the point confluent with the præfrontal bar, but not united with the temporal streaks.

FOOD AND BREEDING.—Nothing known.

GROWTH.—Maximum Length. 375 mm. (1 foot, $2\frac{3}{4}$ inches). Tail 62 mm. ($2\frac{3}{4}$ inches).

LEPIDOSIS.—As detailed in the synopsis.

DISTRIBUTION.—*Assam.* Namsang near Jaipur, at the foot of the Naga Hills.

NOTE.—Only one specimen is known.

Oligodon dorsalis (Gray).

O. dorsalis, Boulenger, *Cat.* II, 1894, p. 241. Venning, *Bomb. N. H. J.*, XX, pp. 338 and 772. Wall, *Bomb. N. H. J.*, XVIII, p. 327; *l. c.* XIX, p. 831.

COLOUR.—Dorsally brown the colour deepening in the flanks. A light vertebral stripe from the nape to the tip of the tail, outlined with black, involves the vertebral and half the next row. A black linear stripe on the confines of the second and third rows above the ventrals. A basal and a sub-terminal caudal blackish bar. Ventrally parti-coloured black and white, some shields being entirely black or white, others half black and half white. Beneath the tail is crimson, unspotted and unbanded. Head powdered with black. A more or less distinct transverse bar on the præfrontals, and a chevron on the nape sending forward a median streak to meet the præfrontal bar. These may be very obscure, losing definition as age advances.

FOOD.—Nothing known.

BREEDING. (A) *The Sexes.*—The female appears to grow longer than the male. In females the body is rather longer, and the tail rather shorter than in the males as seen by the ventral and subcaudal shields. (Ventrals ♂ 162 to 182, ♀ 170 to 189. Subcaudals ♂ 35 to 51, ♀ 27 to 40.)

(B) *Method of Reproduction.*—From the size and character of eggs I have seen “in abdomina” there is no doubt that the species is oviparous.

(C) *Season.*—From available data eggs appear to be hatching from June to about the end of September. Venning’s six inch specimen was killed on the 17th of June. A gravid female with eggs in an advanced stage of development was acquired by me on the cartroad below Shillong on the 20th of August 1907. Supposing these eggs were fit for discharge they would not probably have hatched for six or eight weeks.

(D) *The eggs.*—The specimen just referred to contained two eggs, but as it had been mutilated by cartwheels it is possible there were more.

GROWTH.—(a) *The Hatchling.*—The smallest specimen known to me was 152 mm. (6 inches) in length, but it is uncertain whether this was a hatchling.

(b) *Maximum Length.* 560 mm. (1 foot, 8 inches). Tail 68 mm. ($2\frac{3}{4}$ inches).

LEPIDOSIS.—(a) *Typical.*—As detailed in the synopsis.

(b) *Anomalies.*—In a specimen from Haka the 3rd and 4th rows above the ventrals blend, redivide, and reunite repeatedly on the left side in the anterior part of the body. I have seen two postoculars on one side in one specimen.

DENTITION.—As indicated in the synopsis. I have two skulls.

DISTRIBUTION.—*Assam.* Garo Hills. (Tura, Ind. Mus.). Naga Hills. (Samaguting. Ind. Mus. Namsang, near Jaipur, F. W.) Khasi Hills. (Ind. Mus., Shillong, F.W.). *Bengal.* Chittagong Hills. (Ind. Mus.). *Burma.* Chin Hills. (Haka 6,500 ft. Bombay Colln.). Mansi, Katha Dist. (Lat. $24^{\circ}1$. Long. $97^{\circ}4$. Bombay Colln.).

NOTE.—I have now examined eighteen examples.

Oligodon brevicauda Günther.

O. brevicauda, Boulenger, *Cat. II*, 1894, p. 240.

COLOUR.—Light brown dorsally with two lateral darker stripes. The upper involves the lower half of the seventh, and the sixth rows above the ventrals, and extends from the nape to the tip of tail. It is bordered with a black line above which is interrupted anteriorly and renders the light vertebral stripe increasingly conspicuous from the fore body posteriorly. The lower stripe involves the lower half of the third, and the second rows, and extends from the neck to the vent. Ventrally pink, half or the whole of several ventrals blackish. Tail pink beneath, immaculate or with a few spots. Head with a transverse dark bar across the præfrontals reappearing below the eye. An oblique, dark, temporal stripe from the gape to the parietals. A dark frontal spot which may be confluent with the præfrontal bar. A broad dark chevron on the nape.

FOOD AND BREEDING.—Nothing known.

GROWTH.—Maximum Length. 480 mm. (1 foot, 7 inches). Tail 50 mm. (2 inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis. Peculiar in that the internasals are wanting as in *herberti*.

(b) *Anomalies*.—There is sometimes a segment detached from the parietals which forms a spurious upper anterior temporal.

DISTRIBUTION.—*Western Ghats*.—South of the Goa Gap. (Nilgiris. Anamalais. Travancore Hills.)

Oligodon taeniolatus (Jerdon).

Coronella taeniolata, Jerdon, *J. A. S., Bengal*, XXII, 1853, p. 258.

Oligodon subgriseus, Boulenger, *Cat. II*, 1894, p. 243. Ferguson, *Bomb. N. H. J.*, X, p. 71. Millard, *Bomb. N. H. J.*, XV, p. 348. Pearlless, *Spol. Zeylan*, 1909, p. 54. Sarasin, *Zool. Jahr. Jena*, 1910, p. 130. Slater, *List. Sn. Ind. Mus.*, 1891, p. 25. Wall, *Bomb. N. H. J.*, XVI, p. 298; *l.c.*, XIX, p. 556; *l.c.*, XXVI, p. 568. *Spol. Zeylan*, 1921, p. 406. Willey, *Spol. Zeylan*, 1906, p. 233.

Oligodon taeniolatus, Wall, *Oph. Tap.*, 1921, p. 239.

COLOUR.—Subject to much variation. Dorsally the ground colour is tawny or light brown. The anterior inferior edges of some of the scales are edged with a lighter and some a darker shade so as to form a fine variegation. The darker streaks show a more or less decided tendency to form crossbars of which there may be from 28 to 42 on the body and 7 to 11 on the tail. In some specimens there is an intermediate series of less obvious bars. In most specimens there are four more or less distinct darker longitudinal stripes. The upper and broader stripes pass from the nape where they are confluent, to the tip of the tail, and involve the edge of the vertebral, and two and half adjoining rows. The lower stripes pass from the neck to the vent, and involve the contiguous halves of the 2nd and 3rd rows above the ventrals. A pale line occupies the middle of the vertebral row, and expands anteriorly to the edge of the uppermost row. The belly is pearly white and usually quite immaculate but some specimens exhibit a few scattered brownish spots in the posterior part of the body. The head is marked with three dark bars.

The anterior crosses the præfrontals and reappears below the eye; the median is chevron-shaped with its apex on the frontal and its limbs pass obliquely to the gape; the third and broadest is chevron-shaped and situated on the nape, its apex extending forwards to the parietals. These marks which are so characteristic of the species of this genus are usually complete and discrete, but may be more or less confluent in the median line, or disintegrate. In some old specimens they become effaced, and replaced by a fine mottling.

Four varieties may be recognised of which the first three are completely connected.

Variety (A) (a). In this the variegations are light and sparse, the bars are not or hardly suggested, and the stripes are wanting or very faint.

Variety (A) (b) *taeniolatus* (Jerdon). The variegations are more pronounced than in (A) (a) and both bars and stripes are fairly conspicuous.

Variety (C) (c) *fasciatus* (Günther). Like the last but with the bars replaced by from 23 to 37 round, indented, or completely bisected spots on the body, and from 5 to 11 on the tail. I have examined specimens intermediate between (A) (b) and (A) (c), i.e., with spots anteriorly and crossbars posteriorly.

Variety (C) *spilonotus* (Günther). Differs from the previous forms in having large, light-edged marks, shaped like a walnut kernel, and reminding one of the ornamentation seen in *splendidus*, *venustus* and *juglandifer*: There are from 13 to 23 of these on the body, and 4 to 6 on the tail.

FOOD.—I have found lizard's (or snake's ?) eggs in the stomach many times and also frog's spawn.

BREEDING.—(a) *Method of reproduction*.—I have examined a gravid female with eggs of such a size and character, as to make it fairly certain that the species is oviparous.

(b) *Season*.—Two specimens found in company at Bangalore, on the 23rd of April 1920, proved to be ♂ and ♀. The latter showed no enlargement of the ovarian follicles. A young specimen, apparently a hatchling which measured 122 mm. ($4\frac{7}{8}$ inches), was taken by me at Cannanore in March. None of the 18 females collected by me in the Nilgiris and Wynad in the months of June to September 1917 were gravid, but 14 young of the year varying from 150 to 232 mm. (6 to $9\frac{1}{4}$ inches) were brought in during that period.

(c) *The Brood*.—The only gravid female that has come into my hands contained four large eggs. The date of capture is unfortunately not on record.

GROWTH.—(a) *The Hatchling*.—The smallest specimens I have seen were 118 mm. ($4\frac{3}{4}$ inches), date unknown, and 121 mm. ($4\frac{7}{8}$ inches) in March. I have seen another $4\frac{7}{8}$ inches long, date and locality not on record.

(b) *Early Life*.—From rather meagre figures at my disposal it would appear to grow about 5 inches a year in the first three years of life, when it would be about 20 inches long.

(c) *Maximum Length*.—The longest I know taped 585 mm. (1 foot 11 inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis,

(b) *Anomalies*.—*Praefrontals*.—Rarely quite separated by the frontal. *Parietals*. Sometimes a small detached portion forms a spurious upper anterior temporal. *Loreal*. Rarely absent, being confluent with the præfrontal. *Praeocular*. I have seen two in one specimen. *Postoculars*. Rarely three. *Supralabials*. The 3rd and 4th are rarely confluent. I have seen the 3rd divided in one specimen, as one sees the 4th divided in *purpurascens* and *violaceus*. In one specimen the 6th was cuneate and failed to reach the edge of the lip. Rarely there is a supernumerary making the total 8. *Ventrals*. I have seen the last divided like the anal in one example. *Anal*. Rarely entire. *Subcaudals*. Rarely some at the base of the tail are entire.

DENTITION.—From five skulls in my collection.

Maxillary.—An edentulous space anteriorly followed by 6 to 7 teeth. *Palatine*. Edentulous anteriorly and posteriorly; a single tooth (or none?) in the middle. *Pterygoid*. Edentulous anteriorly and posteriorly; 6 to 10 teeth in the middle. *Mandibular*. A short edentulous space anteriorly followed by 12 teeth.

DISTRIBUTION.—*Ceylon*. *Peninsular India* to Sind and Baluchistan in the North-West, the Western Himalayas, and to Bengal (Purnea) in the North-East.

Variety (A) (a).—Baluchistan (Khila Abdulla). Sind. Punjab. Western Himalayas (Dhikala, Garhwal District). Bengal (Purnea District). Throughout the Peninsula. Ceylon.

Variety (A) (b). Sind. N.-W. Frontier. Punjab. Western Himalayas (Dhikala, Garhwal District). Bengal (Barrakur) to South India and Ceylon.

Variety (A) (c).—Western Ghats (Matheran. Mysore Hills. Wynad. Nilgiris. Anamalais. High Range, Travancore. Tinnevely Hills). Ceylon.

I have examined specimens intermediate between (A) (b) and (A) (c) from Mysore Hills (Koppa), the Anamalais, Tinnevely Hills and Bellary.

Variety (B).—Western Ghats (Castle Rock, Canara. Mysore Hills. Anamalais. Nelliampathi Hills. Travancore.)

***Oligodon ellioti* Günther.**

O. ellioti, Sarasin, Zool. Jahr. Jena, 1910, p. 138. Wall, Bomb. N. H. J., XIX p. 533.

COLOUR.—Very like *taeniolatus* (Jerdon). Dorsally brown; with the anterior inferior borders of some scales edged lighter and others darker, so forming a variegation. There are from 36 to 40 darker, light-edged crossbars on the body (or spots with a median indentation anteriorly and posteriorly), and 10 to 11 on the tail. The spots are completely bisected in the forebody and on the tail in one specimen, which thus resembles a specimen of variety *fasciatus* of *taeniolatus*. Three darker ill-defined stripes are more or less in evidence. The median stripes begin on the nape, and end at the tail tip, and involve the vertebral, and the next one and a half rows. A narrower lateral stripe begins in the neck and passes to the vent, and involves the lower half of the fourth, the third and the upper half of the second rows above the ventrals. Ventrally

yellowish and unspotted, or with the basal parts of the ventrals dusky. A dark transverse bar crosses the præfrontals and edge of the frontal to reappear below the eye. A dark chevron with its apex on the frontal and its arms passing to the gape curves forward to the throat, and nearly meets its fellow behind the posterior sublinguals. A dark broad mark on the nape is projected forwards in the middle line to the posterior angle of the frontal.

FOOD AND BREEDING.—Nothing known.

GROWTH.—*Maximum Length*.—343 mm. (1 foot, $1\frac{1}{2}$ inches). Tail 47 mm. ($1\frac{7}{8}$ inches).

LEPIDOSIS.—As detailed in the synopsis.

DISTRIBUTION.—South India. Ceylon ?

NOTE.—Only three specimens are known, the type in the British Museum, labelled "Madras Presidency," and two discovered by me in the Bombay collection labelled *O. subgriseus*.

One of these is from Nasik, and the other said to be from Ceylon, but before finally accepting the last locality it would be advisable to await confirmation of this.

***Oligodon sublineatus* Dumeril and Bibron.**

O. sublineatus, Abercromby, *Sn. of Ceylon*, 1910, p. 72. *Spol. Zeylan.* 1911, p. 206. Annandale, *J. A. S. Beng.*, 1905, p. 175. Boulenger, *Cat. II.* 1894, p. 242; *l.c.* III, 1896, p. 640. Pearless, *Spol. Zeylan.* 1909, p. 54. Sarasin, *Zool. Jahrb. Jena*, 1910, p. 134. Slater, *List Sn. Ind. Mus.* 1891, p. 25. Wall, *Spol. Zeylan.* 1910, p. 37; *l.c.* 1921, p. 400. *Oph. Tap.* 1921, p. 248. Willey, *Spol. Zeylan.* 1906, p. 233.

COLOUR.—Dorsally brown, the anterior inferior borders of many scales edged darker and lighter to form a variegation. A series of from 12 to 15 paired dark brown, light-edged spots on the body, 3 to 4 on the tail. These sometimes alternate with those of the opposite side. Ventrally whitish with three series of brown spots, sometimes confluent into lines. The lateral pass from the neck to the tip of the tail. The median ceases at the vent. Head with a dark præfrontal bar re-appearing below the eye. A similar transverse bar on the posterior part of the frontal, and anterior edge of the parietals. A dark bar on the nape, sometimes interrupted in the median line, sometimes confluent in the median line with the frontal bar. These marks tend to become obscure with age. They are sometimes very distinct and discrete, sometimes more or less confluent, or disintegrated.

FOOD.—On two occasions I have found the eggs of a lizard (or snake ?) in the stomach. In one there were two soft shelled eggs 17 mm. ($\frac{5}{8}$ of an inch) long, and in the other a single egg about 13 mm. ($\frac{1}{2}$ an inch) long.

BREEDING.—(a) *Method of Reproduction*.—The single gravid female that has come into my hands contained an egg of such dimensions as to leave no doubt that the species is oviparous.

(b) *Season*.—The gravid specimen was killed on the 4th of October 1920, and must have been very near the climax of her oöesis.

(c) *The Brood*.—My one gravid female contained but one egg which measured 26×5 mm. (1 inch $\times \frac{1}{6}$ of an inch).

GROWTH.—(a) *The Hatchling*.—The length at exovation is not known, but one is justified in assuming that it is appreciably smaller than in *taeniolatus*, probably less than 100 mm. (4 inches).

(b) *Early Life*.—Two specimens obtained in 1920, one in January 200 mm. (8 inches) and the other in February 178 mm. ($7\frac{1}{2}$ inches) were probably hatched in the preceding year, and these seem to indicate that the young as in so many other snakes double their length in the first year of life. Eight specimens obtained between August and October and varying from 225 to 263 mm. (9 to $10\frac{1}{2}$ inches) would make it appear that these were about eighteen months old.

(c) *Maturity*.—My egg-bound female taped 412 mm. ($9\frac{1}{4}$ inches), a length suggesting that she was about eighteen months old.

(d) *Maximum Length*.—The largest known to me was 324 mm. ($12\frac{3}{4}$ inches) long, the tail 38 mm. ($1\frac{1}{2}$ inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis.

(b) *Anomalies*. *Loreal*.—I have seen this absent on one side in three specimens. *Supralabials*. The 2nd and 3rd were confluent on one side in two specimens, and on both sides in one example. *Costals*. In one specimen the 6th and 7th rows above the ventrals blended and redivided several times anteriorly so that the costals were alternately 15 and 13. Rarely the 2nd and 3rd rows above the ventrals blend posteriorly, so that the rows count 13 at a point two heads lengths before the vent.

DENTITION.—From three skulls in my collection. *Maxillary*. An edentulous space anteriorly that would take about 2 teeth, followed by from 6 to 8 teeth. *Palatine*. Edentulous? *Pterygoid*. A long edentulous space anteriorly, followed by from 4 to 6 teeth. *Mandibular*. An edentulous space anteriorly that would take two or three teeth, followed by from 9 to 10 teeth.

DISTRIBUTION.—Peculiar to Ceylon. A denizen of the low country ascending to 3,000 feet. South Prov. (Galle), West Prov. (Colombo, Matugama, Veyangoda), Sab'wa Prov. (Ratnapura and Yatiyantota Districts), Central Prov. (Peradeniya.)

NOTE.—There are two specimens in the Indian Museum labelled Nicobar Islands on the authority of de Roepstorff. This is to be distrusted. The same authority is responsible for two other equally startling records from the Nicobar Islands, viz., *Polyodontophis sagittarius* which does not occur south of Lower Bengal, and *Amblycephalus monticola* a hill-snake that does not occur south of Assam.

***Oligodon templetoni* Günther.**

O. templetoni, Abercromby, *Sn. of Ceylon*, 1910, p. 73. Boulenger, *Cat.* II, 1894, pp. 241 and 359. Sarasin, *Zool. Jahr. Jena.*, 1910, p. 127. Wall, *Spol. Zeylan.* 1921, p. 400. *Oph. Tap.* 1921, p. 245. Willey, *Spol. Zeylan.* 1906, p. 233.

COLOUR.—Dorsally brown, with a more or less distinct lighter vertebral stripe from the nape to the tip of the tail. A series of darker brown or blackish brown transverse lateral bars, involving the 5th, 6th and 7th rows above the ventrals. There are about 18 of these on the body, and 5 on the tail. Ventrally dappled with squarish black and white (yellow or pinkish in life) spots. A fine peppering of dark brown on the

head, a dark oblique stripe below the eye. An oblique dark bar behind the gape nearly meeting its fellow over the nape.

FOOD AND BREEDING.—Nothing known.

GROWTH.—(a) *The Young*.—The smallest specimen I have seen was 126 mm. (5 inches) in length, but as the navel was completely effaced it is certain that the young are less than this when hatched or born.

(b) *Maximum Length*.—The longest I have measured was 290 mm. (11½ inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis.

(b) *Anomalies*. *Loreal*.—Sometimes touches the eye below the præocular. *Postoculars*. Sometimes only the upper touches the parietals. *Supralabials*. The 6th is sometimes cuneate and fails to reach the edge of the lip. *Sublinguals*. The posterior rarely touch the 3rd as well as the 4th infralabial.

DENTITION.—From one skull in my collection. *Maxillary*. An edentulous space that would carry 2 teeth followed by 7 teeth. *Palatine*. Edentulous. *Pterygoid*. Edentulous. *Mandibular*. An edentulous space anteriorly that would take 1 tooth, followed by 7 teeth.

DISTRIBUTION.—Peculiar to Ceylon. A low country species ascending to about 3,000 or 4,000 feet. South Prov. (Udugama), West Prov. (Hewissa, Matugama), Sab'wa Prov. (Ratnapura, Balangoda), Cent. Prov. (Peradeniya).

***Oligodon melaneus* Wall.**

O. melaneus, Wall, *Bomb. N. H. J.*, XIX, p. 349.

TYPE.—In the British Museum. Co-type in the Bombay Natural History Society's collection. Both from Sukna, Darjiling District.

COLOUR.—Dorsally blackish. Under a lens the ground colour is seen to be blackish and finely powdered with lighter blue-grey speckling. Ventrally uniform deep bluish grey, the throat and chin rather paler. Head like the body above, and without marks.

FOOD.—Nothing known.

BREEDING.—The type was egg bound and contained four (five?) eggs about 12 mm. (½ an inch) long. This and a male (the co-type) were dislodged from a heap of loose metal on the road side. Unfortunately no date of capture was recorded.

GROWTH.—*Maximum Length*.—333 mm. (1 foot, 1½ inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis.

(b) *Anomalies*. *Anal*.—In the co-type the anal is entire.

DISTRIBUTION.—*Bengal*. (Sukna, Darjiling District, 540 feet).

NOTE.—Only two specimens are known.

***Oligodon travancoricus* Beddome.**

O. travancoricus, Ferguson, *Bomb. N. H. J.*, X, p. 71. Sarasin, *Zool. Jahr. Jena* 1910, p. 138.

COLOUR.—Dorsally light brown, with a series of dark brown or blackish, light-edged bars, 25 to 33 on the body, and 5 to 6 on the tail. These bars are frequently indented in the middle line anteriorly and posteriorly. Belly marked with squarish black and white dapplings.

On the head there is a dark light-edged transverse præfrontal bar re-appearing below the eye, a similar transverse bar over the frontal passing obliquely over the temporal region, and a similar bar behind the parietals passing to the side of the neck. These bars may be more or less confluent in the median line.

FOOD AND BREEDING.—Nothing known.

GROWTH.—*Maximum Length*.—465 mm. (1 foot, $6\frac{2}{5}$ inches). Tail 65 mm. ($2\frac{3}{5}$ inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis.

(b) *Anomalies. Supralabials*.—The 6th sometimes reaches the edge of the lip, the 5th and 6th are partially confluent on one side in one specimen.

DENTITION.—From one skull in my collection. *Maxillary*.—An edentulous space anteriorly that would take 2 to 3 teeth, followed by 7 teeth. *Palatine*. Edentulous. *Pterygoid*. An edentulous space anteriorly that would take 5 to 6 teeth, followed by 12 teeth. *Mandibular*. An edentulous space anteriorly that would take 1 tooth, followed by 8 teeth.

DISTRIBUTION.—*Western Ghats*.—South of the Palghat gap. (High Range, Travancore. Tinnevely Hills).

***Oligodon cruentatus* (Günther).**

Simotes cruentatus, Boulenger, *Cat.* II, 1894, p. 231. *Faun. Mal. Pen. Rept.* 1912, p. 150. Flower, *P. Z. S.*, 1896, p. 885. Wall and Evans, *Bomb. N. H. J.*, XIII, pp. 349 and 617.

COLOUR.—Dorsally brown, with the anterior inferior borders of many scales edged lighter and darker to form a sparse variegation. A light vertebral stripe from the nape to the tail tip involving the vertebral and the next two rows. An indistinct dark stripe from the neck to the vent on the contiguous halves of the 3rd and 4th rows above the ventrals where the rows are 17, and of the 2nd and 3rd where 15. A blackish band on the base of the tail, and a similar band subterminally. Ventrally dappled with squarish black and yellow (white in spirit) spots to the vent. Crimson beneath the tail. Head with a dark transverse bar on the edge of the præfrontals and frontal reappearing below the eye. An oblique dark temporal bar from behind the gape to the parietal, usually meeting its fellow on the frontal. A dark sagitta with its point on the frontal or detached, and the arms passing to the side of the neck. In old specimens these head marks are more or less disintegrate and obscure. Chin whitish with some fine mottling on the lips.

FOOD.—In one specimen I found four soft-shelled eggs in the stomach dubiously snake's or lizard's.

BREEDING.—Nothing known.

GROWTH.—(a) *The Young*. I have never had a specimen smaller than 245 mm. ($9\frac{5}{8}$ inches). The annual growth cannot be estimated from my records.

(b) *Maximum Length*. 387 mm. (1 foot, $3\frac{1}{4}$ inches).

LEPIDOSIS.—(a) *Typical*. As detailed in the synopsis.

(b) *Anomalies. Loreal*. Rarely absent, being confluent with the præfrontal. *Præocular*. Rarely two. *Supralabials*. I have seen the

2nd and 3rd confluent on one side in one specimen. *Infralabials*. Sometimes only four, in which case the 4th only touches the posterior sublinguals. *Subcaudals*. Rarely one or more at the base of the tail or entire.

DENTITION.—From two skulls in my collection. *Maxilla*. 14 to 16, no edentulous space. *Palatine*. 8 to 10, no edentulous space anteriorly or posteriorly. *Pterygoid*. 14 to 18, no edentulous space anteriorly. *Mandibular*. 17 to 18, no edentulous space anteriorly.

DISTRIBUTION.—*Burma*. Pegu, Toungoo, Rangoon, Minglegon, Yuathit, Prome District, Mandalay. Bhamo.

NOTE.—Stoliczka's record of Penang seems to me to call for confirmation.

Oligodon violaceus (Cantor).

Simotes violaceus, Boulenger, *Cat.* II, 1894, p. 222; *l. c.* III. 1896, p. 640. Slater, *List Sn. Ind. Mus.* 1891, p. 23. Wall and Evans, *Bomb. N. H. J.*, XIII, pp. 350 and 618. Wall, *Bomb. N. H. J.*, XII, pp. 672 and 766; *l. c.* XIX, p. 831.

COLOUR.—Very variable. I would divide individuals into the following categories, all of which however are completely connected by intermediate forms.

Var A. *violaceus* Cantor (= Var *cinereus* Günther). Dorsally varying shades of brown with sometimes a ruddy or violaceous tinge. Rarely the colour of a boiled prawn. There are no cross bars or stripes. Belly whitish with or without dark, squarish, lateral spots.

Var B. *multifasciatus* Jan (= *semifasciatus* Anderson). Usually darker brown than the last, the anterior inferior margins of many scales edged darker and lighter to form a variegation. The dark streaks congregate to form cross bars, varying from 19 to 27 on the body, and 3 to 7 on the tail. In most specimens an intermediate series of less distinct bars are to be seen, but in a few examples the intermediate series are as distinct as the former, and then there may be from 39 to 55 bars on the body. In some specimens all the bars are obscure and the belly is unspotted. To such Günther applied the name *swinhonis*. Belly with dark, squarish, lateral spots usually disposed on alternate sides and alternate ventrals. Some specimens exhibit an ill-defined, darker, longitudinal median stripe from the neck to tail tip, involving the vertebral and the next two and a half rows and enclosing a narrow pale vertebral stripe. A similar narrower lateral stripe passes from the neck to the vent, and involves the contiguous edges of the 2nd and 3rd rows above the ventrals. The head in all varieties has a dark præfronto-frontal cross bar which reappears below the eye. A similar dark oblique temporal bar passes from behind the gape to the parietals. A dark sagitta on the nape is projected forwards to the frontal, or has its point detached. These head marks are very distinct in some examples, obscure in others, especially in old specimens.

The two varieties referred to are completely connected by specimens showing every gradation, from faint (*swinhonis*) to dark cross bars, and every degree from scanty and small, to numerous and dark, squarish spots on the belly.

FOOD AND BREEDING.—Nothing known.

GROWTH.—(a) *The Young.* I have seen examples 178 and 185 mm. long (7 and $7\frac{3}{8}$ inches) which appeared to have been recently born or hatched. No dates unfortunately are on record.

(b) *Maximum length.*—760 mm. (2 feet, 6 inches). Tail 75 mm. (3 inches).

LEPIDOSIS.—(a) *Typical.* As detailed in the synopsis.

(b) *Anomalies.* *Internasals.*—Quite divided by the rostral in one example. *Parietals.* Sometimes a small portion is detached to form a spurious upper anterior temporal. *Supralabials.* Rarely the 2nd and 3rd, or the 4th and 5th are confluent. The 3rd may be cuneate, and not reach the edge of the lip. In some specimens the 3rd as well as the 4th is divided into an upper and a lower part. In some the 4th is not so divided. *Infralabials.* The 3rd and 4th are sometimes confluent. *Subcaudals.* It is not very unusual to find some of these shields entire at the base of the tail.

DENTITION.—From one skull in my collection. *Maxillary.* 10 to 11, no edentulous space anteriorly. *Palatine.* 8, no edentulous space anteriorly or posteriorly. *Pterygoid.* 11 to 13, no edentulous space anteriorly. *Mandibular.* 15 to 16, no edentulous space anteriorly.

DISTRIBUTION.—*Assam. Chittagong. Burma. Indo-China. South China.*

Var. (A) *violaceus.* Uniform or with bars and stripes very faint.

Burma.—Tounggyi, S. Shan States (Brit. Mus.). Rangoon. Mingle-gon. Arakan Hills. (F.W.). *Indo-China.* Camboja (Brit. Mus.). *S. China.* Hongkong (F.W.).

Var. (B) *multifasciatus.* (a) With 19 to 27 distinct bars on body, 3 to 7 on tail, and less distinct intermediate bars. *Assam.* Cherrapunji, Khasi Hills. Samaguting, Naga Hills. *Bengal.* Tinsukia (F.W.). Chittagong Hills (Ind. Mus.). *Burma.* Mansi, Katha District. Tounggyi, S. Shan States (Bombay colln.). Kunchoung (F.W.).

(b) With 39 to 55 bars on the body, 4 to 8 on the tail; all equally distinct. *Assam.*—Nazira (Ind. Mus.). Halem (F.W.). Naga Hills (Anderson). *Burma.* Kunchoung (F.W.).

NOTE.—Boulenger mentions Bengal as part of its habitat. I cannot trace the authority for this. There is a specimen from the Chittagong Hills, which are politically in Bengal, in the Indian Museum, but I have found more than one specimen from the Eastern Himalayas in museums, wrongly identified, which proved to be *albocinctus*. (One such is specimen No. 16523 in the Indian Museum).

***Oligodon venustus* Jerdon.**

O. venustus, Boulenger, *Cat. II*, 1894, p. 235. Sarasin, *Zool. Jahr. Jena*, 1910, p. 138. *Bomb. N. H. J.*, XXIII, p. 169; *l.c.* XXVI, p. 567.

COLOUR.—Dorsally brown, with a series of from 23 to 31 spots on the body, and from 6 to 7 on the tail. These spots are large, and shaped like walnut kernels. They are demarcated by a blackish areola, outside which is a pale border. Sometimes some of the spots are bisected in the median line. In many specimens a similarly-coloured, smaller spot is seen laterally especially in the fore body. Ventrally dappled with squarish black and yellow spots. Sometimes the black is replaced by a few small brownish spots disposed laterally. Head with a dark præ-

frontal bar reappearing below the eye, a dark oblique temporal streak from behind the gape to the parietal shields, usually meeting its fellow. A dark sagitta on the nape with its point on the frontal and usually confluent with the temporal stripe in the median line, and sometimes with the præfrontal bar. In old specimens the head marks may be obscure, and more or less disintegrated. Chin yellow with black sutures.

FOOD.—I have found reptilian eggs (lizard's, possibly snake's), and frog's spawn, with occasionally a snail with more or less of the shell intact.

BREEDING.—The young appear in the month of June and preceding months.

GROWTH.—(a) *The Young*. The smallest specimen I have seen, which appeared to be newly hatched or born, measured 112 mm. ($4\frac{1}{2}$ inches).

(b) *Early life*. Specimens measuring from 240 to 264 mm. ($9\frac{1}{2}$ to $10\frac{1}{2}$ inches) in August and September seem to indicate that the young double their length in the first year of life.

(c) *Maximum length*. 495 mm. (1 foot, $7\frac{1}{2}$ inches). The tail 70 mm. ($2\frac{3}{4}$ inches).

LEPIDOSIS.—(a) *Typical*. As detailed in the synopsis. The 6th supralabial is almost as frequently excluded from the edge of the lip, as extending to the labial margin.

(b) *Anomalies*. *Loreal*.—Frequently absent, being either confluent with the nasal, or the præfrontal. *Supralabials*. Rarely the 2nd and 3rd, or the 5th and 6th are confluent. Rarely there is a supernumerary making eight. *Costals*. Rarely the 3rd and 4th rows above the ventrals blend, and re-divide several times before the 15 rows are finally established.

DENTITION.—From seven skulls in my collection. *Maxillary*. An edentulous space anteriorly that would take 1 or 2 teeth, followed by from 7 to 8 teeth. *Palatine*. An edentulous space anteriorly that would take 2 to 3 teeth, followed by from 1 to 3 teeth. An edentulous space posteriorly that would take about 5 or 6 teeth. *Pterygoid*. An edentulous space anteriorly that would take about 5 teeth, followed by from 4 to 8 teeth. *Mandibular*. No edentulous space anteriorly. 9 to 11 teeth.

DISTRIBUTION.—*Western Ghats*. *South of the Goa gap*. Wynad. Nilgiris. Palnis. Cochin. Travancore.

Oligodon melanozonatus Wall.

O. erythrorhachis, Annandale, *Rec. Ind. Mus.* 1912, p. 48. *O. melanozonatus*, Wall, *Rec. Ind. Mus.*, XXIV. p. 29.

TYPES.—In the Indian Museum (Nos. 16798 and 16799).

COLOUR.—Dorsally light brown obscurely mottled with blackish. A series of twenty rather ill-defined, black cross bars on the body, and four on the tail. In the smaller and half grown specimen these are edged anteriorly and posteriorly with black as in *albocinctus*. Ventrally white with transverse, black, irregularly-disposed cross bars, many as broad as the ventral shields. The tail is similarly marked beneath. Head with an obscure, dark, præfronto-frontal bar, reappearing below the eye,

a black-edged chevron with its point on the frontal and the arms passing obliquely over the temporal region. A pale, black-edged sagitta on the nape with its point directed forwards.

FOOD AND BREEDING.—Nothing known.

GROWTH.—*Maximum Length.* 513 mm. (1 foot, $8\frac{1}{4}$ inches). Tail 83 mm. ($3\frac{3}{8}$ inches).

LEPIDOSIS.—(a) *Typical.* As detailed in the synopsis. In one specimen there are seven supralabials on the left side. A cuneate 6th is suggested on both sides in one example, which appears to be confluent with the 5th. The same may be said of the right side in the other specimen.

DISTRIBUTION.—*Assam.* Upper Rotung Valley, Abor Hills, at about 2,000 feet elevation.

***Oligodon erythrogaster* Boulenger.**

Simotes octolineatus, Günther, *P. Z. S.* 1861, p. 216. *Rept. Brit. Ind.*, 1864, p. 206 (footnote).

Oligodon erythrogaster, Boulenger, *Rec. Ind. Mus.*, 1907, p. 216. Wall, *Bomb. N. H. J.*, XIX, p. 1000; *l.c.* XXII, p. 639.

TYPE.—In the Indian Museum (No. 16108).

COLOUR.—Dorsally brown, lighter in the flanks. A light vertebral stripe with a median dark line passes from the nape on to the tail, involving the vertebral and half the next row of scales. A blackish stripe passes from the nape to the tail tip involving the contiguous halves of the seventh and eighth rows above the ventrals, confluent on the neck with its fellow and passing forwards to the frontal, and similarly confluent on the tail. Three light stripes pass down each side of the body to the vent which are separated by narrow black stripes. Belly coral red in the median line to the end of the tail, with white, black-edged spots laterally, the edges of the ventrals light brown. Head with a dark præfrontal band reappearing below the eye, a dark oblique temporal stripe from the supraocular to behind the gape. A dark sagitta on the nape, its point (sometimes detached) on the frontal, confluent posteriorly with the uppermost dark body stripe.

FOOD.—Nothing known.

BREEDING.—An egg-bound female was killed on the 11th of June 1911, which contained four elongate eggs 27×5 mm. ($1\frac{1}{8} \times \frac{1}{2}$ of an inch). This specimen measured 455 mm. (1 foot $5\frac{3}{4}$ inches). Tail 75 mm. (3 inches).

GROWTH.—*Maximum Length.* The female just referred to is the largest of four specimens examined by me.

LEPIDOSIS.—(a) *Typical.* As detailed in the synopsis. The sixth supralabial is cuneate, and fails to reach the edge of the lip. In one example on one side the sixth supralabial has a small detached fragment which comes to the edge of the lip. The costals sometimes reduce posteriorly to 13 rows.

DENTITION.—From one skull in my collection. *Maxillary.* An edentulous space anteriorly that would take 2 to 3 teeth, followed by 7 to 8 teeth. *Palatine.* An edentulous space anteriorly that

would take 2 to 3 teeth, followed by 2 to 3 teeth. An edentulous space posteriorly that would take 5 to 6 teeth. *Pterygoid*. An edentulous space anteriorly that would take about 6 teeth, followed by 4 teeth. *Mandibular*. An edentulous space anteriorly that would take 1 to 2 teeth, followed by 5 to 6 teeth. An edentulous space posteriorly that would take about 5 teeth.

DISTRIBUTION.—*Eastern Himalayas*. Nepal to Sikkim. Tindharia (F.W.).

Oligodon theobaldi (Günther.)

Simotes beddomii, Boulenger, *Cat. II*, 1894, p. 229. Sarasin, *Zool. Jahr. Jena*, 1910, p. 138. Wall, *Bomb. N. H. J.* XXIII, p. 170.

Simotes theobaldi, Boulenger, *Cat. II*, 1894, p. 230. Sclater, *List. Sn. Ind. Mus.* 1891, p. 24. Wall and Evans, *Bomb. N. H. J.* XIII, pp. 350 and 618. Wall, *Bomb. N. H. J.* XVIII, p. 783; *l.c.* XXIII, p. 170.

COLOUR.—Dorsally brown of various shades, the anterior inferior borders of many scales edged lighter and darker to form a variegation. A pale vertebral line from the nape on to the tail. A dark stripe from the nape to the tail tip involving the edge of the vertebral and the next three rows. A dark stripe passes from the neck to the vent on the confines of the 3rd and 4th rows above the ventrals where the scales are 17, and on the 2nd and 3rd where 15. Ventrally yellow, immaculate, or with a few scattered dark spots posteriorly. Head with a dark præ-frontal bar reappearing below the eye, an oblique dark temporal stripe from behind the gape meeting its fellow on the frontal to form a chevron. A dark chevron on the nape, its point (sometimes detached) passing to the posterior angle of the frontal and its arms to the side of the neck. Chin and throat immaculate.

FOOD.—Nothing known.

BREEDING.—I have seen a gravid female with three eggs measuring 18 mm. ($\frac{3}{4}$ of an inch) in length. The dam was 295 mm. ($11\frac{1}{2}$ inches) long. The date of capture is not on record. Judging from these eggs it is probably oviparous.

GROWTH.—*The Young*. My smallest specimen was 115 mm. ($4\frac{5}{8}$ inches) long, but it is fairly certain the young when hatched or born are appreciably less than this.

(b) *Maximum Length*. 380 mm. (1 foot, 3 inches). Tail 30 mm. ($1\frac{1}{8}$ inches.)

LEPIDOSIS.—(a) *Typical*. As detailed in the synopsis.

(b) *Anomalies*. *Supralabials*. I have seen the 5th confluent with the lower postocular. *Infralabials*. In some specimens the 5th only touches the posterior sublinguals. *Subcaudals*. I have seen the last two entire in one example.

DENTITION.—From two skulls in my collection. *Maxillary*. 15 to 16 teeth; no edentulous space anteriorly. *Palatine*. 9 teeth; no edentulous space anteriorly or posteriorly. *Pterygoid*. 16 to 18 teeth; no edentulous space anteriorly. *Mandibular*. 16 to 17 teeth; no edentulous space anteriorly or posteriorly.

DISTRIBUTION.—*Assam.* Tuia, Garo Hills (Bombay colln.). *Burma.* As far north as Myitkyina (Bombay colln.) and south to Tenasserim (Ind. Mus.).

NOTE.—The locality of specimen No. 11712 in the Indian Museum labelled Karachi is obviously a mistake. Its identity is correct. Wynad, on the authority of Beddome (types of *beddomei* in the British Museum), must also be discredited.

***Oligodon affinis* Günther.**

O. affinis, Boulenger, *Cat.* II, 1894, p. 236. Ferguson, *Bomb. N. H. J.*, X, p. 70. Sarasin, *Zool. Jahr. Jena*, 1910, p. 138. Wall, *Bomb. N. H. J.* XXVI, p. 568.

COLOUR.—Brown dorsally, the anterior inferior borders of many scales edged darker to form a sparse variegation. A series of from 31 to 41 dark, light edged, linear cross bars over the body becoming indistinct or obsolescent on the tail. These bars involve about 5 to 7 scale rows in the breadth of the snake. Ventrally boldly dappled with squarish black and yellow spots, from throat to tail tip, many of which may be confluent across the belly. Head with a dark præfronto-frontal bar reappearing below the eye, a dark oblique temporal streak from the gape meeting its fellow across the parietals to form a chevron, and usually confluent with the præfrontal bar in the median line. A thin chevron on the nape, its point confluent with the preceding chevron, and the arms passing to the sides of the neck. Chin white with black sutures.

FOOD.—I have found the soft shelled eggs of a lizard (or snake?) in the stomach.

BREEDING.—A specimen 100 mm. (4 inches) in length captured in July indicates that the season for the appearance of the young is somewhat earlier in the year.

GROWTH.—(a) *The Young.* My smallest specimen was 100 mm. (4 inches), but from what we know of other species it is almost certain that the young are even smaller than this when hatched or born.

(b) *Maximum Length.* 342 mm. (1 foot 1½ inches.) Tail 44 mm. (1¾ inches).

LEPIDOSIS.—(a) *Typical.* As detailed in the synopsis.

(b) *Anomalies.* *Parietals.* Sometimes a detached fragment forms a spurious upper anterior temporal. *Loreal.* Rarely present. *Supra-labials.* The 2nd in one specimen on one side was cuneate, and failed to reach the edge of the lip.

DENTITION.—From one skull in my collection. *Maxillary.* An edentulous space anteriorly that would take 2 teeth, followed by 7 teeth. *Palatine.* With a single tooth near its middle. *Pterygoid.* An edentulous space anteriorly that would take 5 to 6 teeth, followed by 4 teeth. *Mandibular.* An edentulous space anteriorly that would take 1 tooth, followed by 8 teeth. An edentulous space posteriorly that would take 3 teeth.

DISTRIBUTION.—*Western Ghats.* South of the Goa gap. Wynad to Travancore.

Oligodon arnensis (Shaw).

Simotes arnensis, Abercromby, *Sn. of Ceylon*, 1910, p. 72. Boulenger, *Cat. II*, 1894, pp. 229 and 359. Ferguson, *Bomb. N. H. J.*, X, p. 71. Sarasin, *Zool. Jahr. Jena*, 1910, p. 130. Slater, *List Sn. Ind. Mus.*, 1891, p. 24. Wall, *Bomb. N. H. J.*, XVIII, p. 115; *l.c.* XIX, p. 532; *l.c.* XXII, p. 749. Willey, *Spol. Zeylan.* 1906, p. 233.

COLOUR.—Dorsally brown of various shades, with sometimes a purplish or ruddy tinge. The whole body and tail are crossed by black bars edged with yellow or buff. These bars vary considerably in number according to locality. In Ceylon specimens there are from 13 to 18 on the body and 3 to 6 on the tail. In Indian specimens south of the Nerbudda and the Ganges Valley, they usually number from 19 to 30 (15 and 16 in two Travancore examples) on the body, and 4 to 16 on the tail. In specimens north of the Nerbudda and in the Ganges Valley they are usually from 28 to 40 on the body (47 in a specimen from Bihar), and 7 to 20 on the tail. Where the number is small the bars involve from 4 to 5 scales vertebally in the fore body, 2 to 3 behind; but where it is large they involve from 1 to 2 scales vertebally. These bars usually break up in the flanks, and in some specimens there is a darker variegation to be seen in the flanks intermediate to the bars. In some specimens the bars are replaced by twin, or quadrimaculate transversely-placed spots as one sees in variety *fasciatus* of *taeniolatus*. The belly is partly white and usually immaculate, but some specimens show a series of dark spots placed laterally and with a tendency to be disposed on alternate ventrals, and alternate sides. The head has a dark præfronto-frontal bar, which reappears below the eye, a dark oblique temporal streak from behind the gape, which usually meets its fellow on the frontal to form a chev. on. A short dark oblique streak is frequently seen in the suture between the 5th and 6th supralabials. A dark chevron is placed on the nape with its point in the interparietal suture, and its arms pass to the side of the neck. Where there are few cross bars on the body this chevron involves from 8 to 10 or more scales vertebally, but where the cross bars are numerous it involves from 3 to 4 scales vertebally. All the head markings are almost always discrete, very distinct, and usually edged with buff or yellow.

FOOD.—On two occasions I have found the soft shelled eggs of a lizard (or snake?) in the stomach. A plug of hair in the cloaca of one example indicates that it will eat small mammals.

BREEDING.—(a) *Method of Reproduction*. Eggs I have taken from the abdomen were of such a size and character as to leave little doubt that it is oviparous in habit.

(b) *Season*. I had a female in Fyzabad with eggs seemingly fit for discharge in August, and another with less advanced eggs in the same month.

(c) *The Eggs*. I have seen half a dozen or more egg-bound females and find that the clutch numbers from two to five. The most advanced eggs measured 36 by 10 mm. ($1\frac{4}{10}$ by $\frac{7}{10}$) of an inch. No embryo could be discovered within.

GROWTH.—(a) *The hatchling*. I have had three young which appeared to be hatchlings and which measured from 165 to 170 mm. ($6\frac{1}{2}$ to $6\frac{3}{4}$ inches).

(b) *Maturity.* The smallest egg-bound female I have seen measured 442 mm. (1 foot, $5\frac{1}{2}$ inches).

(c) *Maximum Length.* 635 mm. (2 feet, 1 inch) is the largest measurement I know.

LEPIDOSIS.—(a) *Typical.* As detailed in the synopsis.

(b) *Anomalies.* *Rostral.* I have once seen this entirely separating the nasals. *Parietals.* Sometimes a small fragment is detached to form a spurious upper anterior temporal. *Loreal.* Not infrequently absent, being confluent with either the præfrontal or the posterior nasal. *Præoculars.* Rarely two. *Supralabials.* Two are sometimes confluent, the series counting six in consequence. The 2nd is rarely divided and the series then counts eight. The 6th is sometimes cuneate, and fails to reach the edge of the lip. The 6th and 7th are rarely confluent. *Infralabials.* Occasionally there are five. *Anal.* I have twice seen this entire. *Subcaudals.* Rarely a few at the base of the tail are divided.

DENTITION.—From three skulls in my collection. *Maxillary.* An edentulous space anteriorly that would take about 3 teeth, followed by from 8 to 11 teeth. *Palatine.* An edentulous space anteriorly that would take about 2 teeth, followed by from 3 to 6 teeth. An edentulous space posteriorly that would take about 4 teeth. *Pterygoid.* An edentulous space anteriorly that would take about 4 to 6 teeth, followed by 10 to 17 (?18) teeth. *Mandibular.* No edentulous space anteriorly, 13 to 14 teeth.

DISTRIBUTION.—*Ceylon. Peninsular India.* To Sind and Baluchistan in the North-West. North-West Frontier, Western Himalayas to 5,500 feet. To Bihar and Lower Bengal in the North-East. (Calcutta. Kaliganj, Rangpur District.)

***Oligodon woodmasoni* (Slater).**

Simotes woodmasoni, Annandale, *J. A. S. Beng.* 1905, pp. 173 and 175. Boulenger, *Cat. II*, 1894, p. 223.

TYPES.—In the Indian Museum (Nos. 8459 and 12547).

COLOUR.—Dorsally brown with a ruddy tinge. A light vertebral stripe from the nape well on to the tail. Three other narrower light stripes pass down each side of the body from the neck to the vent. These are separated by blackish stripes. As age advances the blackish stripes tend to fade so that the larger of the two specimens seen by me is nearly uniform in colour. Belly dusky reddish beneath, the edges of the ventrals lighter. Head with a dark præfrontal bar reappearing below the eye. A dark streak on the first three supralabials to the anterior nasal. An oblique temporal streak from behind the gape to the parietals. A dark sagitta on the nape projected forwards to the frontal shield.

FOOD AND BREEDING.—Nothing known.

GROWTH.—(a) *Early Life.* A specimen measuring 177 mm. ($6\frac{1}{2}$ inches) appears to be a hatchling.

(b) *Maximum Length.* 600 mm. (1 foot, $11\frac{5}{8}$ inches). Tail slightly deficient.

LEPIDOSIS.—(a) *Typical.* As detailed in the synopsis.

(b) *Anomalies.* *Loreal.* Absent on one side in one specimen.

DISTRIBUTION.—*Andamans. Nicobars.*

Oligodon albocinctus (Cantor).

Simotes albocinctus, Annandale, *Rec. Ind. Mus.*, 1912, pp. 37, 48 and 53, Boulenger, part. *Cat.* II, 1894, p. 220; *Rec. Ind. Mus.* 1913, p. 338. Evans, *Bomb. N. H. J.*, XVI, p. 169. Slater, *List Sn. Ind. Mus.*, 1891, p. 23. Venning, *Bomb. N. H. J.*, XX, p. 338. Wall, *Bomb. N. H. J.*, XIX, pp. 348, 757a, 830 and 898; *l.c.* XXII, p. 756.

COLOUR.—Variety (A) *O. albocinctus* (Cantor). Dorsally brown of various shades from the very lightest to the deepest hue, even to blackish brown. Many specimens exhibit a ruddy tinge which may be pronounced especially in the flanks. More rarely the prevailing hue is salmon pink. The back bears a series of whitish, greyish, buff, yellow or dusky brown cross-bars. These bars are well defined with black outside and have often a thin edging of buff or yellow. In ruddy specimens they are yellow. They are very well defined and conspicuous in light specimens, but in very dark specimens they may be very obscure. They number from 19 to 27 on the body and 4 to 8 on the tail. Frequently some intermediate scales in the flanks are edged with black and form a patch of variegation. In the space preceding the first bar there are usually two dark lines, parallel or curved so as to form an incomplete ellipse. In some specimens two more or less distinct, but ill-defined darker stripes pass down the body. The upper and broader passes from the neck well on to the tail and involves the edge of the vertebrals, and the next two rows. The lower passes from neck to vent, and involves the contiguous halves of the 3rd and 4th rows above the ventrals. The belly is whitish, yellowish or brownish (pinkish in the ruddy tinged specimens) with squarish, brown or blackish, lateral spots or mottling, the black in dark specimens often predominating. The head has a dark præ-fronto-frontal bar which reappears below the eye, and a dark oblique temporal bar from behind the gape to the parietals. The brown on the neck sends forwards a projection to the frontal shield, the tip of which is often detached. These head marks are usually well defined with blackish outside with a narrow edging of buff or yellow. In ruddy specimens they are yellow. The chin and throat are usually immaculate or there may be a dusky mark in the suture between the 4th and 5th infralabials.

Variety (B) *amabilis* (Günther). Differs from the preceding in having an intermediate and less conspicuous series of cross-bars. These specimens very closely resembles variety *multifasciatus* of *violaceus*, and I have found several in museums wrongly identified as *violaceus*.

FOOD.—I have only three records that reveal the nature of the diet. One contained a mouse, another a newly born mouse, and a third the tail of a mouse.

BREEDING.—My only record of a gravid female is one killed at Dibrugarh in July. Only three follicles were impregnated. I have records of well over one hundred specimens and the dearth of egg-bound females is therefore remarkable.

GROWTH.—(a) *The Young*.—The smallest I have seen and which appeared to be recently hatched or born was 200 mm. (8 inches) long.

(b) *Maturity*.—My only gravid female was 742 mm. (2 feet, 5½ inches) long.

(c) *Maximum Length*.—915 mm (3 feet). Tail (imperfect) 100 mm. (4 inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis.

(b) *Anomalies*.—*Loreal*. Rarely absent, being confluent with the præfrontal. *Temporals*. The anterior is rarely confluent with the posterior superior shield. *Supralabials*. I have seen the 1st divided into an upper and a lower part in one example on both sides. The 2nd or 3rd are rarely divided vertically, thus making 8 shields in the series. The 5th and 6th, or the 6th and 7th are rarely confluent making the series 6. The 6th is rarely confluent with the anterior temporal. *Costals*. I have once seen 21 rows. The rows rarely reduce to 17 two heads-lengths before the vent. *Subcaudals*. Some at the base of the tail are rarely entire.

DENTITION.—From three skulls in my collection. *Maxillary*. 10 to 12, no edentulous space anteriorly. *Palatine*. No edentulous space anteriorly, 8 to 10 teeth, followed by an edentulous space that would take 1 to 2 teeth. *Pterygoid*. An edentulous space anteriorly that would take 1 tooth, followed by 18 to 23 teeth. *Mandibular*. 15 to 18 teeth. No edentulous space anteriorly or posteriorly.

DISTRIBUTION.—Variety (A) *Eastern Himalayas*. Buxa Dooars to Sikkim. *Assam*. Hills and plains as far north as the Abor Hills and south to Chittagong in Eastern Bengal. *Burma*. Kachin Hills. (Sadon. Lat. 25°·4. Long. 98°. Sima. Lat. 25°·2. Long. 97°.) Manipur (Assam). Chin Hills.

Variety (B) *Assam*. Plains and hills. *Burma*. Arakan Hills.

Oligodon juglandifer (Wall).

Simotes albocinctus, part. Boulenger, *Cat.* II, 1894, p. 220. Wall, part. *Bomb. N. H. J.*, XIX, p. 348.

Simotes juglandifer, Wall, *Bomb. N. H. J.*, XX, p. 1162.

TYPE.—In the Bombay Natural History Society's Collection (No. 210) from Tindharia, Darjiling District.

COLOUR.—Dorsally brown of various shades from deep brown to blackish brown. Many scales edged buff and black to form a variegation which is most pronounced in the flanks. A series of from 22 to 28 large dark brown or black spots on the body, and 6 to 8 on the tail. These spots are shaped like walnut kernels, having an indentation anteriorly and posteriorly, but are sometimes completely bisected. In some specimens a smaller spot is to be seen outside and close to the median spots. In some specimens there is an intermediate series of less distinct and smaller spots arranged transversely. In some specimens four dark stripes may be seen, the upper and broader passing from the neck to tail tip and involving the edge of the vertebrals and next two rows, sometimes confluent with that of the opposite side. A narrow dark stripe passes from the neck to the vent on the edges of the 3rd and 4th rows above the ventrals. Belly whitish, buff or brownish with a series of squarish, deep brown or black lateral spots, usually disposed on alternate ventral shields, those of one side usually alternating with those on the other. Head with a dark præfronto-frontal bar reappearing below the eye. A dark oblique black-edged bar from behind the gape to the parietals. A dark black-edged mark on the nape sends forward a projection to the frontal, the point of which is often detached. Chin and throat immaculate, or with a dark mark in the suture between

the 4th and 5th infralabials. I have seen specimens the colour of a boiled lobster.

FOOD AND BREEDING.—Nothing known.

GROWTH.—(a) *The Hatchling*.—My smallest specimen possibly a hatchling measured 233 mm. ($9\frac{1}{4}$ inches).

(b) *Maximum Length*.—853 mm. (2 feet, $9\frac{3}{4}$ inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis.

(b) *Anomalies*.—*Supralabials*. The 5th and 6th are rarely confluent reducing the series to six. *Costals*. In one specimen the 4th or 5th row above the ventrals divided and re-united several times so that they counted 21 in places.

DENTITION.—From four skulls in my collection. *Maxillary*.—No edentulous space anteriorly, 10 to 12 teeth. *Palatine*. An edentulous space anteriorly that would take 1 or 2 teeth followed by 6 to 8 teeth. An edentulous space posteriorly that would take 2 or 3 teeth. *Pterygoid*. An edentulous space anteriorly that would take one tooth, followed by from 16 to 18 teeth. *Mandibular*. No edentulous space anteriorly or posteriorly, 13 to 17 teeth.

DISTRIBUTION.—*Eastern Himalayas*. Sikkim. Assam.

Oligodon purpurascens¹ (Schlegel.)

Simotes purpurascens, Boulenger, *Cat. II*, 1894, p. 219. *Faun. Mal. Pen. Rept.*, 1912, p. 148. Flower, *P. Z. S.*, 1896, p. 884; *l.c.* 1899, p. 671. Malcolm-Smith, *Jourl. N. H. Siam*, 1915, p. 213. Mocquard, *Rept. L'Indo-Chine*, 1907, p. 46.

Simotes cyclurus, Boulenger, *Cat. II*, 1894, p. 219. *Faun. Mal. Pen. Rept.*, 1912, p. 149. Flower, *P. Z. S.*, 1896, p. 884; 1899, p. 671. Malcolm-Smith, *Jourl. N. H. Siam*, 1914, p. 97; *l.c.* 1915, pp. 213 and 245. Mocquard, *Rept. L. Indo-Chine*, 1907, p. 46. Wall and Evans, *Bomb. N. H. J.* XIII, pp. 350 and 617. Wall, *P. Z. S.*, 1903, p. 92. *Bomb. N. H. J.*, XVIII, p. 781; *l.c.* XIX, p. 348. Werner, *Abh. Akad. der. Wiss.*, 1903, p. 365.

COLOUR.—This, like *taeniolatus*, is an extremely variable species. There are two main types of colouration. (A) *Oligodon purpurascens cyclurus* (Cantor). Dorsally the prevailing hue varies between a pale brown, and blackish brown. Usually some of the scales are narrowly edged with blackish, and others with buff thus producing a variegation. The darker variegation tends to form narrow cross-bars involving one or two scale rows in the length of the snake. In many specimens these cross-bars are conspicuous on the body and tail, and most of these exhibit a less conspicuous series of intermediate bars. Many specimens also exhibit four more or less conspicuous, darker, longitudinal stripes. The upper and broader of these passes from the neck to the tail tip, involving the edge of the vertebral and the next one and a half rows, leaving a pale linear stripe between them, but in many specimens these stripes are confluent vertebally. The lower and narrower stripe passes from the

¹ I have for some years suspected that *purpurascens* (Schlegel) and *cyclurus* (Cantor) would prove to be one and the same species. My last visit to England this year (1922) gave me an opportunity of examining all the species labelled *purpurascens* and *cyclurus* in the British Museum. I examined the two supposed species side by side, and made most careful measurements of head shields and tried in vain to find some difference by which the two could be separated. The scale rows and ventrals and subcaudals agree in their ranges, and one is forced to the conclusion that they should be regarded as a single species. Schlegel's *purpurascens* (1837) has precedence over Cantor's *cyclurus* (1839.) I have also examined equally carefully a large series of both *cyclurus* and *purpurascens* in the Indian Museum, and Bombay Natural History Society's collections.

neck to the vent, and involves the contiguous halves of the 3rd and 4th rows above the ventrals. These stripes, in the young especially, are sometimes well defined and conspicuous; in many specimens however they are ill-defined, inconspicuous, or even absent. The belly is whitish or yellowish, sometimes immaculate, sometimes with a few scattered brownish, squarish, lateral spots especially posteriorly, and sometimes so heavily spotted that blackish brown is the predominant colour. The head has a dark praefronto-frontal bar which re-appears below the eye, and a dark oblique temporal stripe from behind the gape to the parietal shields. A dark sagitta on the nape sends forwards a process to the frontal shield, the point of which may be detached. In some specimens this is more or less confluent with the oblique temporal stripe. The chin and throat are usually immaculate or there may be some dusky marks in some of the sutures.

Specimens may be grouped as follows:—

A (a). Very pale brown. Variegations absent or faint. Stripes absent or faint. Belly immaculate.

A (b). Brown. Variegations (and consequently the cross-bars) more or less conspicuous. These number from 9 to 17 on the body, 3 to 4 on the tail, or twice this number if the narrower intermediate series are counted. Stripes absent or faintly suggested. Belly with a few dark spots mostly posteriorly.

A (c). Dark Brown. Variegations forming conspicuous narrow dark bars. Stripes conspicuous. Belly heavily spotted. These sub-varieties are all completely connected by intermediate forms.

(B) *O. purpurascens maculatus*. Differs from A in having a series of large dark spots across the back, involving four or more scale rows vertebally in the length of the snake, and reminding one of the ornamentation seen in *venustus*, *splendidus* and variety *spilonotus* of *taeniolatus*. There are from 9 to 13 (16 Malcolm-Smith) on the body, and 2 to 4 on the tail. Sometimes these are indented mesially or even completely bisected, especially in the fore body and on the tail. Sometimes they are more or less confluent with a smaller spot placed outside them. Some of these specimens exhibit some variegation as in variety A (b) and a series of cross-bars between the large dark spots. Some have stripes similar to variety A (c). The belly is immaculate. Head marks as in A. This variety is rare within Indian limits, but the common one in Siam.

Variety (C). *O. purpurascens purpurascens* (Schlegel). This differs from A in having the narrow cross-bars light instead of dark. In the British Museum specimen from Borneo there are 12 such bars on the body and 3 on the tail. A somewhat similar specimen in the same museum I would label *albocinctus* were it not for the locality, viz., Java. I count the ventrals 182 and subcaudals 41. This differs from all the other specimens (labelled *purpurascens*) in the British Museum in that the third supralabial is not divided into an upper and lower part, and does not touch the eye. In this respect as in others it agrees with *albocinctus*.

Variety (D). An unusual specimen in the British Museum from Borneo, donor Mr. Shortridge, has 11 broad cross-bars on the body and 3 on the tail. These cross-bars are not indented mesially, are bordered with black posteriorly, and by double black lines anteriorly enclosing a

whitish zone. There are also black bordered light annular spots dorso-laterally in the bars.

FOOD.—In one instance a toad had furnished the meal. In two specimens I have found the soft-shelled eggs of a lizard (or snake ?) in the stomach. On one occasion Mr. Jacob, I. F. S., sent me four soft shelled eggs, which he suspected had been laid by a *cyclurus* which he found in close proximity. On investigating the eggs which measured 27×16 mm. ($1\frac{1}{8} \times \frac{3}{5}$ of an inch) I extracted embryos that were about 62 mm. ($2\frac{1}{2}$ inches) long. Large ventral shields were evident, but there were no longitudinal series of costals, and the head shields were not of an ophidian character. I very much suspect these were lizards' eggs, and that the snake intended to make a meal of them.

BREEDING.—Nothing known.

GROWTH.—(a) *The Young*.—The smallest example of *cyclurus* I have examined, apparently newly hatched or born, measured 175 mm. (7 inches). A *purpurascens* in the British Museum is 207 mm. ($8\frac{1}{8}$ inches).

(b) *Maximum length*.—The largest variety *cyclurus* of which I have any knowledge is one in the Indian Museum [No 7163 type of *O. crassus* (Theobald)] which measures 946 mm. (3 feet, $1\frac{1}{4}$ inches). Flower records a *purpurascens* 950 mm. (3 feet, $1\frac{1}{2}$ inches).

LEPIDOSIS.—(a) *Typical*.—As detailed in the synopsis. The 4th supralabial is normally divided into an upper and a lower part both of which touch the eye.

(b) *Anomalies*.—*Supralabials*. Sometimes the 2nd and 3rd, 3rd and 4th, or 4th and 5th are confluent, thus reducing the series to 7. Rarely the 3rd or the 7th (in one specimen both) are cuneate, and fail to reach the edge of the lip. Sometimes the 4th is an entire shield. Sometimes both the 3rd and 4th are divided. Rarely the 3rd only is divided and the 3rd, 4th and 5th touch the eye. *Infralabials*. Sometimes the 3rd and 4th are confluent. *Costals*. Rarely the 4th or 5th row above the ventrals divides and may re-unite and redivide repeatedly so as to make 21 rows in places. Rarely the rows are 17 at a spot two heads-lengths behind the head becoming 19 shortly after. Rarely again the 4th and 5th rows unite and redivide anteriorly so as to reduce the rows in places to 17.

DENTITION.—From four skulls of *cyclurus* and two of *purpurascens* in my collection. *Maxillary*. 9 to 10 teeth in *cyclurus*, 9 to 10 in *purpurascens*. No edentulous space anteriorly; 6 to 8 teeth in *cyclurus*, 9 in *purpurascens*, an edentulous space posteriorly that would take 1 or 2 teeth. *Pterygoid*. An edentulous space anteriorly that would take 1 or 2 teeth, followed by 11 to 16 teeth in *cyclurus*, 13 to 18 in *purpurascens*. *Mandibular*. 13 to 16 teeth in *cyclurus*, 15 to 16 in *purpurascens*. No edentulous space anteriorly or posteriorly.

DISTRIBUTION.—*Bengal, Eastern Himalayas, Assam, Burma, Malay Peninsula, Siam, Cochin-China, South China.*

Variety A (a). *Bengal.* Calcutta, Jessore, Purnea District. *Burma.* Pegu, Rangoon. *Siam.* Bangkok.

Variety A (b). *Bengal,* Calcutta, Rangpur District, Purnea District, Jalpaiguri District. *Eastern Himalayas.* Sikkim. *Assam,*

Garro Hills, Khasi Hills, North Cachar. *Burma.* Rangoon, Diamond Island, Amherst, Tavoy.

Variety A (c). *Bengal.* Jalpaiguri District. *Eastern Himalayas.* Sikkim. *Assam.* Garo Hills, Khasi Hills. *Burma.* *Siam.*

Variety B. *Burma.* Toungoo, Karen Hills, Kalaw, S. Shan States, Tavoy. *Siam.* (The common form.)

Variety C.—Borneo. Java?

Variety D.—Borneo.

Oligodon splendidus (Günther.)

Simotes splendidus, Boulenger, *Cat.* II, 1894, p. 217. Evans, *Bomb. N. H. J.*, XVI, p. 362. Sarasin, *Zool. Jahr. Jena*, 1910, p. 142. Venning, *Bomb. N. H. J.*, XXIII, p. 164. Wall and Evans, *Bomb. N. H. J.*, XIII, p. 537. Wall *Bomb. N. H. J.*, XVIII, p. 781. *Rec. Ind. Mus.*, II, p. 105.

COLOUR.—Pale brown dorsally, each scale with a dark centre. A series of very large, dark, median spots shaped like walnut kernels, with smaller lateral spots below. These spots have an outer zone of dark brown which is edged with buff. There are from 14 to 17 of these spots on the body, and from 3 to 5 on the tail. Belly whitish or yellowish, with squarish, dark brown, lateral spots, usually on alternate ventrals and alternate sides. Head with an indistinct, dark, prae-fronto-frontal bar reappearing below the eye, and an indistinct dark oblique streak from behind the gape to the parietal. A large dark, mark on the nape, indented mesially behind, is projected forward to the frontal shield.

FOOD.—Nothing known.

BREEDING.—(a) *Method of Reproduction.*—I have seen eggs of such a size and character as to make it tolerably certain that this species is oviparous.

(b) *Season.*—Venning acquired a female in an advanced state of egg bearing on the 14th of February.

(c) *The Eggs.*—I have seen two egg-bound females which contained three and six eggs, respectively. The largest eggs measured 457×152 mm. ($1\frac{1}{2} \times \frac{1}{2}$ an inch). No trace of an embryo could be discovered.

GROWTH.—(a) *The Hatchling.*—The smallest I have seen and apparently a hatchling measured 155 mm. ($6\frac{1}{8}$ inches).

(b) *Maturity.*—The smaller of two egg-bound females measured 465 mm. (1 foot, $9\frac{3}{4}$ inches).

(c) *Maximum Length.*—730 mm. (2 feet, $4\frac{3}{4}$ inches). Tail 100 mm. (4 inches).

LEPIDOSIS.—(a) *Typical.*—As detailed in the synopsis.

(b) *Anomalies.*—*Praefrontals.* Rarely four in a transverse series. *Postoculars.* Rarely three. *Supralabials.* The 4th is sometimes divided into two upper and one lower part.

DENTITION.—From one skull in my collection. *Maxillary.* No edentulous space anteriorly; 11 teeth. *Palatine.* No edentulous space anteriorly or posteriorly; 9 teeth. *Pterygoid.* No edentulous space anteriorly; 14 to 15 teeth. *Mandibular.* No edentulous space anteriorly or posteriorly; 13 to 14 teeth.

DISTRIBUTION.—*Burma.*—Between Lat. 20° and 23° , and Long. 94° and 98° Yamethin, Sagaing, Pyawbwe, Shwebo, Monywa, Mandalay, N. Shan States (Ruby Mines), S. Shan States (Kyaukse, Pakokku).

Synopsis of the salient features of lepidosis and dentition differentiating the species of Oligodon.

COSTALS.			VENTRALS.			Anal.	Subcaudals.	Rostral shields in contact.	Internasals.	NASALS.			Loreal.	Postocular.	Anterior temporal.	SUPRALABIALS.			INFRA-LABIALS.		MAXILL.		PALATINE.			PTERYGOID.		MANDIBLE.			Parietal contributing to orbital ring.	
Two heads-lengths behind head.	Midbody.	Two heads-lengths before vent.	Number.	Angulate.	Rounded.					Entire.	Semidivided.	Divided.				Number.	Touching the eye.	Touching ant temporals.	Number.	Touching post sublinguals.	No. of teeth.	Edentulous space anteriorly.	No. of teeth.	Edentulous space anteriorly.	Edentulous space posteriorly.	No. of teeth.	Edentulous space anteriorly.	No. of teeth.	Edentulous space anteriorly.	Edentulous space posteriorly.		
13	13	13	132 to 142.	..	+?	2	22 to 27	8	2	+	..	..	1	2	1	4 or 5	3rd	4th	4	4th												planiceps.
13	13	13	186 to 208	..	+?	2	37 to 40	6	0	+	..	..	0	1	1	6	3rd & 4th	4th & 5th	4	4th												herberti.
13	13	13	200	..	+	2	39	6	2	+	..	..	0	1	1	7	3rd & 4th	5th & 6th	4	4th												mcDougalli.
15	15	13	144 to 159	..	+?	2	27 to 34	6	2	+	..	..	1	2	1	7	3rd & 4th	5th & 6th	4	4th	15 to 16	0	8 to 10	0	+	13 to 16	+	20	0	0	Yes	torquatus.
15	15	13	154	..	+	2	46 to 64?	6	2	+	..	..	0	2	1	7	3rd & 4th	5th & 6th	4	4th												erythrophachis.
15	15	13	162 to 188	..	+	2	27 to 51	6	2	+	..	..	1	1	1	7	3rd & 4th	5th & 6th	4	4th	6 to 7	+	0?	..	..	1 to 2	+	6 to 9	+	+	No	dorsalis.
15	15	15	158 to 173	..	+?	2	25 to 29	6	0	..	..	+	0	2	1	7	3rd & 4th	5th & 6th	4	4th												brevicauda.
15	15	15	158 to 218	+	..	2	29 to 56	6	2	..	..	+	1	2	1	7	3rd & 4th	5th & 6th	4	4th	6 to 7	+	1?	+	+	5 to 9	+	9 to 12	+	+	No	taeniolatus.

Synopsis of the salient features of lepidosis and dentition differentiating the species of Oligodon—contd.

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COSTALS.			VENTRALS.			Anal.	Subcaudals.	Rostral shields in contact.			Internasals.			NASALS.			Loreal.	Postocular.	Anterior temporal.	SUBBAL- LIAIS.			INTRA- LABIALS.		MAXI- LLA.		PALATINE.			PTERY- GOID.		MANDIBLE.			Parietal contributing to orbital ring.
Two heads-lengths behind head.	Midbody.	Two heads-lengths before vent.	Number.	Angulate.	Rounded.									Entire.	Semidivided.	Divided.				Number.	Touching the eye.	Touching ant tem- poral.	Number.	Touching post sublinguals.	No. of teeth.	Edentulous space anteriorly.	No. of teeth.	Edentulous space anteriorly.	Edentulous space posteriorly.	No. of teeth.	Edentulous space anteriorly.	No. of teeth.	Edentulous space anteriorly.	Edentulous space posteriorly.	
17	17	17	180 to 190	+	..	1	46 to 57	6	2	..	..	+	1	2	1	6	3rd & 4th	5th	4	4th			8 to 10	0	8 to 10	0	+	18 to 23	+	15 to 18	0	0	No	woodmasoni.	
19	19	15	177 to 208	+	..	1	47 to 69	6	2	..	..	+	1	2	1	7	3rd & 4th	5th & 6th	5	4th & 5th	10 to 12	0	8 to 10	0	+	18 to 23	+	15 to 18	0	0	No	albocinctus.			
19	19	15	162 to 208	+	..	1	53 to 68	6	2	..	..	+	1	2	1	7	3rd & 4th	5th & 6th	7	4th & 5th	10 to 12	0	6 to 8	0	+	16 to 18	+	13 to 17	0	0	Yes	juglandifer.			
19	19	15	165 to 190	+	..	1	40 to 60	6	2	..	..	+	1	2	1	8	3rd, 4th & 5th or 3rd, 4th & 5th	6th & 7th	8	4th & 5th	9 to 10	0	9	0	+	18	+	15 to 16	0	0	Yes	purpura-scens.			
19	19	15	189 to 195	+	..	1	29 to 50	6	2	..	..	+	1	2	1	8	3rd, 4th & 5th or 3rd, 4th & 5th	6th & 7th	8	4th & 5th	9 to 10	0	6 to 8	0	+	11 to 16	+	13 to 16	0	0	No	cyclurus.			
21	21	17	169 to 193	+	..	1	35 to 47	8	4	..	..	+	1	2	2	8	4th & 5th	6th & 7th	5	4th & 5th	11	0	9	0	0	14 to 15	0	13 to 14	0	0	Yes	splendidus.			

CORRECTIONS AND AMPLIFICATIONS OF INDIAN LOCALITIES IN Dr. T. H. BECKER'S MONOGRAPH OF THE DOLICHO- PODIDAE (DIPTERA).

By SYDNEY RIBEIRO, *Entomological Assistant, Zoological Survey of India.*

In a recent number of *Capita Zoologica* (Vol. I, pt. 4) Dr. T. H. Becker has published a monograph of the Indo-Australian Dolichopodidae in which a large number of specimens belonging to the Indian Museum are described or recorded. Many of the records of Indian species are wrongly transcribed from the printed labels, others incomplete, and Dr. Annandale has asked me to draw up a correct and amplified list. This I have done in the form of a table with four columns showing (1) the name of the species recorded, (2) the page of the monograph on which it is recorded, (3) the record as given, and (4) the record corrected and with such additions added as I have been able to find on reference to the specimens named by Dr. Becker. If corrections or additions are unnecessary the entry in the last column is left blank.

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Dolichopus</i>			
<i>zickzack</i> Wied. ...	8	Bengalen : Monghyr.— Burma : Rangoon.— Assam : Sylhet.—Kal- kutta, Ceylon.	Calcutta and Monghyr, Bengal ; Sylhet, Assam ; Rangoon, Burma ; Ceylon.
<i>angustinervis</i> Beck. ...	9	Assam : Shillong, Dar- jiling.	Darjiling, E. Himalayas ; Shillong, Assam.
<i>saphirus</i> Beck. ...	10	India orient : Matheran, 800 m hoch.	Matheran, (800 ft.), Thana dist., Bombay Pres.
<i>Paraclius</i>			
<i>adligatus</i> Beck. ...	13	Assam : Sylhet ...	Sylhet, Assam ; Mergui, Tenasserim.
<i>pilosellus</i> Beck. ...	14	Madha, Yenna-Tal, Sata- ro-Distrikt, 2200 Fuss hoch.	Medha, Yenna Valley, Sa- tara dist., (2200 ft.), Bombay Pres.
<i>nudus</i> Beck. ...	14	Helvak, Kogna-Tal, Sata- ro distrikt, 2000 Fuss hoch.	Helvak, Koyna Valley, Satara dist., (2000 ft.), Bombay Pres.
<i>abbreviatus</i> Beck. ...	15	Assam : Sylhet.—Nepal : Tharbani.	
<i>regularis</i> Beck. ...	15	Balighai bei Puri, Orissa. —Kuranda.	

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Hercostomus</i>			
<i>neglectus</i> Beck. ...	22	Indien : Simla, 7000 Fuss hoch.	Simla, (7000 ft.), Simla Hills, W. Himalayas.
<i>elongatus</i> Beck. ...	22	Indien : Simla, 7000 Fuss hoch.	Simla, (7000 ft.), Simla Hills, W. Himalayas.
<i>promotus</i> Beck. ...	23	Indien : Dharampar, Simmla-Hügel, 5000 Fuss hoch.	Dharampur, Simla Hills, (5000 ft.), W. Himalayas.
<i>chetifer</i> Walk. ...	26	Naini-Tal, Kumaon, 6000 Fuss hoch.	Naini Tal, (6000 ft.), Kumaon, W. Himalayas.
<i>compositus</i> Beck. ...	27	Mahabaleshivar, Satara-Distrikt, 4200 Fuss hoch.	Mahabaleshwar, Satara dist., (4200 ft.), Bombay Pres.
<i>gregalis</i> Beck. ...	29	.....	Darjiling, (7000 ft.), E. Himalayas; Dawna Hills, (2000—3000 ft.), Tenasserim.
<i>flavicinctus</i> Beck. ...	29	Thissgannyinaung, Dawna-Berge.	Thingannyinaung to Sukli, Dawna Hills, (900—2100 ft.), Tenasserim.
<i>caecus</i> Beck. ...	30	N.—Indien : Darjiling, 7000 Fuss hoch.	Darjiling, (7000 ft.), E. Himalayas.
<i>bitinctus</i> Beck. ...	31	Assam, Mangaldal.	Mangaldai, N. E. Assam.
<i>geminatus</i> Beck. ...	31	Kalkutta; Assam, Sylhet.	Calcutta, Bengal; Sylhet, Assam.
<i>Tachytrechus</i>			
<i>salinarius</i> Beck. ...	32	Bombay; Westbengalen, Paresnath.	Paresnath Hill, Chota Nagpur, Bihar; Bombay.
<i>crassitarsis</i> Meij. ...	32	Nepal, Toral, Kumdhik.	Kumdhik, Nepal Terai.
<i>Thinophilus</i>			
<i>tesselatus</i> Beck. ...	35	Bengalen : Rajshai.	Calcutta and Rajshai.
<i>diminuatus</i> Beck. ...	36	Indien vom Gangesdelta, Channel Creek.	Channel Creek nr. Mud Point, Ganges delta, L. Bengal; Balighai nr. Puri, Orissa.
<i>indigenus</i> Beck. ...	37	.....	Sukhwani, Nepal; Bijarani, Naini Tal dist., (Plains), U. Provs.; Yaikam, Travancore, Madras Pres.; Balighai near Puri, Orissa; Calcutta, Kushtia and Madhupur, Bengal; Sylhet, Assam.

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Hydrophorus</i>			
<i>praecox</i> Lehm. ...	41	Indien : Pankong-Tal und vom Suezkanal.	Pankong Valley, (Tantkze to Chagra), Pamirs [Yarkand Mission]; Suez Canal, on board ship at night. (N. Annandale Coll.).
<i>Paralleloneurum</i>			
<i>cilifemoratum</i> Beck. ...	43	Umgegend von Kalkutta und aus Bengalen.	Calcutta and Madhupur, Bengal; Sylhet, Assam.
<i>Phalacrosona</i>			
<i>imperfectum</i> Beck. ...	46	Indien : Kumaon, 5700 Fuss hoch, nahe bei Bhowali.	Near Bhowali, (5700 ft.), Kumaon, W. Himalayas.
<i>fulgidipes</i> Beck. ...	46	Baragh, Simla—Hügel.	Barogh, (5000 ft.), Simla Hills, W. Himalayas.
<i>Medetera</i>			
<i>adsumpta</i> Beck. ...	48	Umgebung von Kalkutta.	
<i>grisescens</i> Meij. ...	50	Indien : Trivandrum, Travancore. — Assam, Sylhet.	Almora, (5500 ft.), Kumaon, and Bijnor, U. Provs.; Shencottah, Madras Frontier, W. side of W. Ghats, and Trivandrum, Travancore, Madras Pres.; Puri, Orissa; Bhogaon Purneah dist. and Chakradharpur, Chota Nagpur, Bihar; Bettiah, Champaran dist., Calcutta, Madhupur and Port Canning, Bengal; Sylhet, Assam; Dawna Hills, (2000—3000 ft.), Tenasserim; Mandalay, U. Burma; Bombay.
<i>platychira</i> Meij. ...	51	.....	Calcutta, Bengal; Sylhet, Assam.
<i>nudicoxa</i> Beck ...	52	Darjeling, Himalaya, 7000 Fuss hoch.	Darjiling, (7000 ft.), E. Himalayas. Paresnath Hill, (4300—4400 ft.), Chota Nagpur, Bihar.
<i>Syntormon</i>			
<i>cilitarsis</i> Beck. ...	56	Assam, Sylhet.	
<i>elongatus</i> Beck. ...	57	Kufri, 5000 Fuss hoch, Simia—Berge.	Kufri, (8000 ft.), Simla Hills and Mundali, (9000 ft.), Jaunsa divn., Dehra Dun dist., W. Himalayas.

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Syntormon</i>			
<i>frivulus</i> Beck. ...	58	Indien : Dharampur, 5000 Fuss hoch, Simia — Berge.	Dharampur, (5000 ft.), and Kufri, (8000 ft.), Simla Hills; and Mundali, (9000 ft.), Jaunsa divn., Dehra Dun dist., W. Himalayas.
<i>Neurogona</i>			
<i>angulata</i> Meij. ...	61	.....	Calcutta, Bengal; Sylhet, Assam.
<i>denudata</i> Beck. ...	62	Kalkutta; Assam, Sylhet; Ceylon.	
<i>pectinata</i> Beck. ...	64	N.—Bengalen : Purneah und Kalkutta.	Purneah, Bihar; Calcutta, Bengal.
<i>exemta</i> Beck. ...	64	Ceylon : Peradeniya.	Peradeniya, Ceylon.
<i>Diaphorus</i>			
<i>vagans</i> Beck. ...	71	Ceylon.	
<i>detectus</i> Beck. ...	72	Nordbengalen : Purneah. und aus Pallode.	Purneah, Bihar; Pallode, 20 miles N. E. of Trivandrum, Travancore, Madras Pres.
<i>maurus</i> O.—Sack. ...	72	Umgebung von Kalkutta	Calcutta, (environs), Bengal; Sukna, (500 ft.), E. Himalayas.
<i>aptatus</i> Beck. ...	73	Kalkutta.	
<i>flavipilus</i> Beck. ...	74	Bombay; Annandale : Shasthancottab.	Shasthancottah, 12 miles N. N. E. of Quilon, Travancore, Madras Pres. (N. Annandale Coll.); Bombay.
<i>nigerrimus</i> Meij. ...	75	Annandale : Travacore.	Tenmalai, W. Ghats, (W. side), Travancore, Madras Pres. (N. Annandale Coll.)
<i>wonosobensis</i> Meij. ...	75	.....	Kurseong, (5000 ft.), E. Himalayas.
<i>hirsutipes</i> Beck. ...	75	Himalaya : Darjiling, 5000 Fuss hoch.	Darjiling, (7000 ft.), E. Himalayas.
<i>protervus</i> Beck. ...	76	Kalkutta.	Calcutta, Bengal; Dawna Hills, (2000—3000 ft.), Tenasserim.
<i>minor</i> Meij. ...	77	Himalaya : Darjiling, 7000 Fuss hoch.	Darjiling, (7000 ft.), and Kurseong, (4700 ft.), E. Himalayas.
<i>simulans</i> Beck. ...	77	Indien : Colombo.	Colombo, Ceylon.
<i>discrepans</i> Beck. ...	78	Umgebung von Kalkutta.	

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Diaphorus.</i>			
<i>mandarinus</i> Wied. ...	78	Verschiedenen Teilen Indiens.	Sarah, Nepal; Khurda Road, Puri dist. and Balighai nr. Puri, Orissa; Katihar, Purneah dist., Bihar; Asansol, Calcutta, (environs), Kuste, Monghyr, Rajmahal and Tinpahar, Bengal; Margherita, Mazbat, Mangaldai dist., Sadiya and Sylhet, Assam; Mandalay and Rangoon, Burma; Kawkareik, Amherst dist. and Dawna Hills, (at base), Tenasserim; Parel Bombay.
<i>submixtus</i> Beck. ...	79	Assam : Margharita.	Margherita and Sadiya, Assam.
<i>habilis</i> Beck. ...	80	Bengalen : Monghyr.	Siripur, Saran, Bihar; Monghyr, Bengal.
<i>intermixtus</i> Beck. ...	81	Assam : Margherita.	Naini Tal, (6000—7000 ft.), Kumaon, U. Provs.; Calcutta, Bengal; Margherita, Assam.
<i>Asyndetus</i>			
<i>latifrons</i> Lw. ...	86	Indian : Katihar, Distrikt Purneah.	Katihar, Purneah dist., Bihar; Asansol, Barrackpore nr. Calcutta, and Rajshai, Bengal; Sylhet, Assam.
<i>Chrysotus</i>			
<i>gratiosus</i> Beck. ...	86	Kalkutta.	
<i>degener</i> Frey ...	87	Umgebung von Kalkutta.	Calcutta, (environs), Madhupur and Monghyr, Bengal; Sylhet, Assam; Mandalay and Rangoon, Burma.
<i>alternus</i> Beck. ...	88	Indien : Burma, von den Dasona-Hügeln, 2—3000 Fuss hoch.	Shamdang, (c. 3000 ft.), Sikkim; Calcutta and Barrackpore nr. Calcutta, Bengal; Dawna Hills, (2000—3000 ft.), Tenasserim.
<i>discretus</i> Beck. ...	89	Mundeli; Dehra Dun—Distrikt, 9000 Fuss hoch; Umgebung von Kalkutta.	Darjiling, (7000 ft.), and Kurseong, (4700 ft.), E. Himalayas; Mundali, (9000 ft.), Jaunsa divn., Dehra Dun dist., W. Himalayas; Calcutta, Bengal; Dawna Hills, (2000—3000 ft.), Tenasserim.

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Trigonocera</i>			
<i>specialis</i> Beck. ...	92	Umgebung von Kalkutta.	
<i>obscura</i> Meij. ...	92	.....	Mandalay, U. Burma.
<i>Sympycnus</i>			
<i>bisulcus</i> Beck. ...	94	.....	Base of Dawna Hills, Tenasserim; Mahabaleshwar, (4200 ft.), Satara dist., Bombay Pres.
<i>gummigutti</i> Beck. ...	95	Nepal: Thamaspur, und von Burma, Dawna-Hügel; von Darjeling, 7000, Fuss hoch.	Darjiling, (7000 ft.), E. Himalayas; Thamaspur, Nepal; Dawna Hills, (at base and at 2000—3000 ft.), Tenasserim.
<i>apicalis</i> Meij. ...	96	.....	Sylhet, Assam.
<i>scutatus</i> Meij. ...	97	.....	Sylhet, Assam.
<i>simplex</i> Meij. ...	99	Indien: Ost-Himalaja, Sukna, 500 Fuss hoch.	Sukna, (500 ft.), and Darjiling, (7000 ft.), E. Himalayas; Barrackpore nr. Calcutta, Bengal; Margherita and Sadiya, Assam.
<i>vivus</i> Beck. ...	99	Burma, Downa-Hügel.	Dawna Hills, (at base), Tenasserim.
<i>strenuus</i> Beck. ...	101	Ceylon: Paradenyia.	Peradeniya, Ceylon.
<i>turbidus</i> Beck. ...	105	Östlichen Himalaja: Kurseong, 4700 Fuss hoch.	
<i>subjectus</i> Beck. ...	105	Burma: Daema-Hügel, 2—3000 Fuss hoch; Bengalen: Madhupur.	Madhupur, Bengal; Dawna Hills, (at base and at 2000—3000 ft.), Tenasserim.
<i>Chrysosoma</i>			
<i>bifiguratum</i> Beck. ...	140	Assam.	
<i>pulcherrimum</i> Beck. ...	145	Ceylon; Ceylon: Nilgiri hill [H. L. Andrews].	Maddathoray, W. base of W. Ghats, Travancore and Nilgiri Hills, (2500 ft.), Madras Pres. [H. L. Andrews Cole.]; Ceylon.
<i>vittatum</i> Wied. ...	146	Indien: Mazbat Mangaldai, Assam; Kalkutta; Ceylon.	Trivandrum, Travancore, Madras Pres.; Calcutta, Bengal; Ceylon; Mazbat, Mangaldai dist., Assam.

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Chrysosoma</i>			
<i>stragulum</i> Beck. ...	150	Indien : Kalattupuzker, base of W. Ghats ; Trivandrum, Travancore ; Madduthoray, Travancore.	Kulattupuzha and Madduthoray, W. base of W. Ghats and Trivandrum, Travancore, Madras Pres.
<i>infirme</i> Beck. ...	152	Ceylon : Paradeniya.	Paradeniya, Ceylon.
<i>sagax</i> Beck. ...	152	Indien : (Fundort ?), Koll. Winthem im Wiener Hof-Mus.	
<i>elongatum</i> Beck. ...	153	Himalajagebirge, 5000 Fuss hoch, Kurseong.	Kurseong, (4700-5000 ft.), E. Himalayas ; Assam-Bhutan Frontier, Mangaldai dist., N. E. Assam.
<i>petulans</i> Beck. ...	154	Ceylon : Paradeniya.	Paradeniya, Ceylon.
<i>decoratum</i> Beck. ...	154	Nordlichen Indien, aus Assam, Sylhet.	
<i>ovale</i> Beck. ...	155	Ceylon : Hineratgoda ; S.—Ceylon; Walisama ; S.—Indien : Nilgiris, 6000 Fuss hoch, Coonor ; Ceylon : Rambodde.	Coonor, (6000 ft.), Nilgiri Hills, Madras Pres.; Hineratgoda, Rambodde and Walisama, Ceylon.
<i>punctiforme</i> Beck.	156	Himalajagebirge : Sukna, 500 Fuss hoch.	Sukna, (500 ft.), E. Himalayas.
<i>inscriptum</i> Beck. ...	157	Kalkutta ; Bengalen : Rajmahal ; Assam : Sylhet.	Calcutta, Kushtea and Rajmahal, Bengal ; Sylhet, Assam.
<i>mirandum</i> Beck. ...	157	Himalajagebirge : Sukna, 500 Fuss hoch.	Sukna, (500 ft.), E. Himalayas ; Siliguri, (base of E. Himalayas), N. Bengal.
<i>spengeli</i> Enderl. ...	158	Süd-Indien : Bangalore, 3000 Fuss hoch.	
<i>annotatum</i> Beck. ...	160	Ceylon : Pattipola, 2000 m. hoch ; Ceylon.	
<i>extractum</i> Beck. ...	161	Ceylon : Paradeniya.	
<i>duplicatum</i> Beck. ...	162	Ceylon : Perideniya, Colombo, Victoria Gardens, Trivandrum, Travancore.	Trivandrum, Travancore, Madras Pres. Peradeniya and Colombo, Victoria Gardens, Ceylon.
<i>excisum</i> Beck. ...	162	Ceylon : Paradeniya.	Peradeniya, Ceylon.
<i>congruens</i> Beck. ...	163	Insel Ceylon.	

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Chrysosoma</i>			
<i>foliatum</i> Beck. ...	164	Ost-Bengalen : Chittagony ; Chittagony, Mazbat und Sukna.	Sukna, (500 ft.), E. Himalayas ; Chittagong, E. Bengal ; Mazbat, Mangaldai dist., Assam.
<i>albidum</i> Beck. ...	164	Himalaja-Gebirge : Karslong, 5000 Fuss hoch ; Sukna, 500 Fuss hoch.	Ghumti, (4000 ft.), Darjiling dist., Kurseong, (5000 ft.), Sukna, (5000 ft.), and Gangtok, (6150 ft.), Sikkim, E. Himalayas.
<i>undulatum</i> Beck. ...	165	Assam : Dibrugarh (Abor Exped.) ; Sylhet.	Dibrugarh (Abor Exped.) and Sylhet, Assam.
<i>brunnipenne</i> Beck. ...	165	Trichinopoly, dem südlichen Indien.	
<i>faciatum</i> Beck. ...	166	Ceylon : Pattipola, 2000 m. hoch.	
<i>oculatum</i> Beck. ...	167	Kumaon bei Rhowali, 5700 Fuss hoch.	Near Bhowali, (5700 ft.), Kumaon, W. Himalayas.
<i>leucopogon</i> Wied. ...	168	Ceylon und Kalkutta.	Agisamtensee, S. end of Kayangulam, Bangalore, and Kulattupuzha, W. base of W. Ghats, Travancore ; Madras, (town), Marikuppam, (2500 ft.), and Oorgaum, (2500 ft.), Madras Pres. ; Puri, Orissa ; Adra, Manbhum dist., Bihar ; Calcutta, Khargpur, Monghyr and Rajmahal, Bengal ; Moulmein, Tenasserim ; Rangoon, Burma ; Bombay and Parel, Bombay Pres. ; Ceylon.
<i>tenuipes</i> Beck. ...	174	bei Barogh, Simia hills, 5000 Fuss hoch ; Kurseong, Himalaja-Gebirge, 6000 Fuss hoch.	Kurseong, (6000 ft.), E. Himalayas ; Barogh, (5000 ft.), Simla Hills, W. Himalayas.
<i>triligatum</i> Beck. ...	177	Südlichen Indien : Perumal ; Trichinopol ; Koonoor, 6000 Fuss hoch, Nilgiris.	Perumal, Trichinopoly and Coonoor, (6000 ft.), Nilgiri Hills, Madras Pres.
<i>compressum</i> Beck. ...	178	Nordbengalen : Kushtea ; Bhogaon, Purneah-Distrikt.	Bhogaon, Purneah dist., Bihar ; Kushtea, Bengal.
<i>muticum</i> Thoms. ...	183	Moulmein, Indien.	Dibrugarh, N. E. Assam ; Moulmein, Tenasserim.

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Chrysosoma</i>			
<i>armillatum</i> Big. ...	183	Colombo ; Ceylon : Kanthalay.	Colombo and Kanthalai, Ceylon.
<i>grossum</i> Beck. ..	186	Indien : Margheritá.	Margherita, Assam
<i>posterum</i> Beck ..	188	Bombay.	
<i>integrum</i> Beck. ...	189	Ceylon : Matala ; Südlichen Indien : Trichinopol ; Kahtal, Purneah-Distrikt [C. A. Paica] ; Colombo, Victoria Gardens.	Allahabad, U. Provs.; Purneah and Katihar, Purneah dist. (C. A. Paiva coll.) and Siripur, Saran, Bihar ; Calcutta and Rajmahal, Bengal ; 10 miles off Masulipatam, (on board ship), and Trichinopoli, Madras Pres.; Colombo, Victoria Gardens, Matala, Ceylon.
<i>perturbans</i> Beck. ...	192	Südlichen Indien : Trichinopoly.	Trichinopoli, Madras Pres.
<i>Sciopus</i>			
<i>tardus</i> Beck. ...	198	.....	Rajmahal, Bengal.
<i>gravipes</i> Beck. ...	199	Ostbengalen : Chittagong.	
<i>interdictus</i> Beck. ...	201	Bombay.	
<i>turbidus</i> Beck. ...	202	Batighai, Orina.	Balighai nr. Puri, Orissa.
<i>pediformis</i> Beck. ...	204	Himalaja-Gebirge : Darjiling, 6—7000 Fuss hoch.	Darjiling, (6000—7000 ft.), E. Himalayas.
<i>penicillatus</i> Beck. ...	204	Shillong, Provinz Assam.	.....
<i>infans</i> Beck. ...	205	Baighai, Orissa.	Balighai nr. Puri, Orissa.
<i>adhaerens</i> Beck. ...	207	Südlichen Indien : Trichinopoly.	Trichinopoly, Madras Pres.
<i>*insecans</i> Beck. ...	208	Kuranda, Indien.	?
<i>bifarius</i> Beck. ...	208	Indien : Cairuna, Kuranda.	?
<i>*triangulifer</i> Beck. ...	211	Indien : Kuranda.	?
<i>variabilis</i> Meij ...	211	.....	Sylhet, Assam.
<i>fruticosus</i> Beck. ...	212	Sylhet, Assam.	

Name.	Page.	Record as given.	Record corrected, with additions.
<i>Condyllostylus</i>			
<i>poecilus</i> Beck. ...	221	Indien : Madura, Shembaganur.	Shembaganur, Palni Hills and Madura, Madras Pres. g
<i>profundus</i> Beck. ...	222	Südindien : Kodaikanal ; Trichinopoly.	Kodaikanal, Palni Hills and Trichinopoly, Madras Pres. ; Sadiya, Assam.
<i>imperfectus</i> Beck. ...	223	Indien, ohne speziellere Fundangabe.	
<i>conspectus</i> Beck. ...	225	Unchagaon, Nainital-distrikt, am Fusse des Himalaja und Kal-kutta.	Kathgodam, (1200 ft.), Kumaon and Unchagoan, Naini Tal dist., base of W. Himalayas ; Bangalore, (3000 ft.), Madras Pres. ; Calcutta and Kushtia, Bengal ; Mergui and Rangoon, Burma.
<i>impar</i> Beck. ...	226	Colombo.	Colombo, Ceylon.
<i>vigilans</i> Beck. ...	226	Himalajagebirge : Darjiling, 7000 Fuss hoch.	Darjiling, (7000 ft.), and Kurseong, (4700—5000 ft.), E. Himalayas ; Margherita, Assam.
<i>jacobsoni</i> Meij. ...	228	.....	Dawna Hills, (2000—3000 ft.), Tenasserim.
<i>Megistostylus</i>			
<i>longicornis</i> Fabr. ...	230	Ceylon ; Indien.	Sikkim, E. Himalayas ; Ceylon.
<i>Mesorhaga</i>			
<i>obscura</i> Beck. ...	232	Ceylon : Pattopola, 2000 m. hoch.	Pattipola, (2000 ft.), Ceylon.
<i>termialis</i> Beck. ...	233	Ceylon.	
<i>nigro-viridis</i> Beck. ...	235	Ceylon.	

A LIST OF THE INDIAN CICINDELIDAE WITH LOCALITIES.

By C. DOVER, F.E.S., *and* S. RIBEIRO, *Assistant, Zoological Survey of India.*

Canon Fowler's comparatively recent volume on the Cicindelidae in the "Fauna of British India" series renders the publication of a catalogue of this family unnecessary. We believe, however, that a revised list of the Indian tiger-beetles with special reference to the collection of the Zoological Survey of India will prove useful, and in submitting the following list hope that this may be so. In preparing it we have arranged the species alphabetically under the genera, partly to facilitate reference, and partly because the affinities of the various species are yet imperfectly known. We have endeavoured to incorporate all information as to geographical distribution and have also added footnotes to certain species where it has been thought necessary. As far as possible the precise situation of the various localities mentioned here has been given. It may be stated that when localities like "Sikhim" is mentioned this does not imply that the insect occurs all over Sikhim, but that the specimen has not been more accurately labelled than this. The localities of specimens in the Museum collection have been marked with an asterisk.

The life-histories and habits of the Cicindelidae are of great interest, but those of the Indian species are practically unknown, and there is a wide field for amateur observations here.

We are indebted both to Drs. N. Annandale and S. W. Kemp of the Zoological Survey of India for their valuable suggestions and help rendered to us in our study of this group. Our thanks to Dr. Walther Horn of the Deutsches Entomologisches Museum, Berlin, the leading authority on the Cicindelidae, for his kindness in looking through and checking this list, as well as for identifying many specimens.

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Family CICINDELIDAE.

Division ALOCOSTERNALIAE.

Subfamily COLLYRINAE.

Genus *Collyris* Fabr. (1801).

- brevipennis* Horn. Bombay, Talewadi* and Castle Rock,* N. Kanara dist., Bombay Pres.
brevipennis var. *elongato-subtilis* Horn.¹ Anaimalai Hills, Madras Pres.
brevipennis var. *subtilesculpta* Horn. Coonoor and Oucherlony Valley* (3,000—3,500 ft.), Nilgiri Hills and Dindigul, Madras Pres. ; Coorg, S. India.
dohrni Chaud. Colombo, Ceylon.
longicollis Fabr.² Sahibganj,* Burdwan dist., Bengal.
mniszechi Chaud. Naga Hills, Assam ; Karen Hills, Burma ; Laos, Indo-China ; Malacca ; Borneo ; (?) Java ; Momeit, Yunnan, W. China.

Genus *Neocollyris* Horn (1901).

- acute-apicalis* Horn.³ Chandkhira, Sylhet, Assam.
ampulicollis Horn.⁴ Wallardi, Travancore.
andrewesi Horn. Trivandrum* and Wallardi, Travancore ; Anaimalai Hills (3,000—4,000 ft.), and Nilgiri Hills,* Madras Pres. ; N. Kanara dist., Bombay Pres. ; Mahe, W coast, India ; (?) Ceylon.
apicalis Chaud. Patkai Hills, Assam ; S. Burma ; Tonkin, Indo-China ; Singapore ; Sumatra ; Malacca.

¹ Cf. Horn (1913, p. 2). Not recorded in the "Fauna."

² Cf. Fowler (1912, p. 225).

³ Cf. Horn (1913, p. 4). Not recorded in the "Fauna."

⁴ Cf. Horn (1913, p. 5). Not recorded in the "Fauna."

- aptera* Lund. Naga Hills and Sylhet, Assam ; Tenasserim.
- apteroides* Horn. Manipur, Assam.
- attenuata* Redt. Soom* (4,500—5,000 ft.), Singla* (1,500 ft.), and Mungphu, Darjiling dist., E. Himalayas ; Nepal ; Simla, Punjab, W. Himalayas ; Calcutta, Bengal ; Khasi Hills, Assam.
- auripennis* Horn. Manipur, Assam ; Tonkin and Annam, Indo-China.
- bipartita* Fleut. India ; Karen Mts., Burma.
- bonelli* Guér. Sikhim* ; Barkuda Id.,* Lake Chilka and Trichur, Cochin State, Madras Pres. ; Calcutta,* Khargpur,* and Rangamati,* (Chittagong Hill Tracts), Bengal ; Siripur,* Saran, Bihar ; Central Provs.* ; Sibsagar,* Khasi Hills,* Naga Hills, Patkai Hills and above Tura,* Garo Hills, Assam ; Maymyo, Tharawaddy and Pegu, Burma ; Tenasserim ; Hills near Taiping,* Perak, Malay Peninsula ; Java* ; S. Kashmir, the Himalayas and S. China to Sumbawa, Sumba, and the Banguay Is., N. Borneo.
- bonelli* var. *batesi* Horn. Khasi Hills, Assam ; Siam ; Cochin China.
- bonelli* var. *diversipes* Fowl. Pashok* (3,500 ft.), Darjiling dist., E. Himalayas ; Tura* (1,200—1,500 ft.), Garo Hills, Assam ; Burma ; Java ; Borneo.
- bonelli* var. *ortygia* Buq. Singla* (1,500 ft.), Darjiling dist., E. Himalayas ; Kashmir, W. Himalayas ; Nepal ; Calcutta* and Rajmahal,* Bengal ; Siripur,* Saran, Bihar ; N. Cachar and Tura* (1,200—1,500 ft.), Garo Hills, Assam ; Bhamo and Tharawaddy, Burma ; Mahe, W. coast, India ; S. China ; Tonkin and Annam, Indo-China ; Malacca ; Singapore ; Sumatra ; Java ; Bali Id., Sumbawa and Sumba, E. Indies ; Siam ; Banguay Is., N. Borneo.
- bonelli* subsp. *distincta* Chaud.¹ Darjiling and Pashok* (3,000 ft.), Darjiling dist., E. Himalayas ; Chatrapur,* Ganjam dist., Madras Pres. ; Balighai* near Puri, Orissa ; Calcutta,* Bengal ; Khasi Hills, Assam ; Castle Rock,* N. Kanara dist., Bombay Pres.
- boysi* Chaud.² Bhutan ; Above Tura* (3,900 ft.), Garo Hills, Assam.
- brevilabris* Horn. Assam ; Karen Hills, Burma.
- ceylonica* Chaud. Ceylon.
- compressicollis* Horn.³ Assam.
- crassicornis* Chaud. Sikhim.
- crassicornis* Dej. Anaimalai Hills, Pondicherry and Gopkuda Id.,* Lake Chilka, Madras Pres. ; Travancore ; Chandipore* near Balasore, Orissa (sea-coast) ; Calcutta* (and environs)* and Maldah,* Bengal ; Chota Nagpur and Ranchi,* Bihar ; Sibsagar,* Assam ; N. Shan States,* Burma ; Ceylon ; Siam ; Malay Peninsula ; Java ; Sumatra ; Indo-China ; Celebes ; Moluccas.
- cruentata* Schm.-Goeb. Sibsagar,* Assam ; Karen Hills, Tharawaddy, Taung-ngu, Rangoon and Pegu, Burma ; Tenasserim ; Siam ; Malacca ; Sumatra ; Borneo.

¹ Cf. Dover and Ribeiro (1921, p. 722). Recorded as a distinct species in the "Fauna."

² Fowler (1912, p. 257) treats this as synonymous with *N. saphyrina* but Horn (1908, p. 104) regards it as a distinct species. The Museum possesses a single example of *N. boysi*, named by Horn.

³ Cf. Horn (1908, p. 106). Not recorded in the "Fauna."

- cylindrica* Schm.-Goeb. Burma.
- cylindripennis* Chaud. Karen Hills, Burma ; Siam.
- feae* Horn. Rangamati,* Chittagong Hill Tracts, Bengal ; Karen Hills, Burma.
- foveifrons* Horn.¹ Khasi Hills, Assam ; Tonkin, Indo-China.
- fuscitarsis* Schm.-Goeb. Sikhim* ; Singla* (1,500 ft.), Darjiling dist., E. Himalayas ; Assam ; Rangoon and Tharawaddy, Burma ; Moulemein, Tenasserim ; Tonkin, Indo-China ; Malacca ; Java ; Sumatra.
- insignis* Chaud. Sikhim* ; Darjiling, Mungphu,* Pankabari,* Pashok* (2,500 ft.), and Singla* (1,500 ft.), Darjiling dist., E. Himalayas ; Bhutan ; Khasi Hills and above Tura* (3,900 ft.), Garo Hills, Assam ; Burma.
- kollari* Horn. (?) S. India ; Centr. India.
- lesnei* Horn. Karen Hills, Burma.
- linearis* Schm.-Goeb. Assam ; Maymyo and Pegu,* Burma ; Cambodia, Saigon and Tonkin, Indo-China ; Siam.
- linearis* var. *srnkae* Horn. Pegu dist. and Ruby Mines, Burma ; Cambodia, Saigon and Tonkin, Indo-China.
- maindroni* Horn. Wallardi, Travancore ; Nilgiri Hills, Madras Pres.
- moesta* Schm.-Goeb. Burma ; Siam ; Perak,* Malay Peninsula ; Cambodia and Tonkin, Indo-China ; Malacca.
- nilgirica* Fowl. Nilgiri Hills, Madras Pres.
- orichalcina* Horn. Nilgiri Hills, Madras Pres. ; Naga Hills (3,500—5,000 ft.), Assam ; Yunnan, W. China.
- parvula* Chaud. Coonoor and Anaimalai Hills (in neighbourhood), and Yercaud,* Shevaroy Hills (3,000—5,000 ft.), Salem dist., Madras Pres. ; Sidapur,* Coorg, S. India ; Castle Rock,* N. Kanara dist. and Belgaum, Bombay Pres. ; Mahe, W coast, India.
- parvula* var. *amoena* Chaud. Castle Rock,* N. Kanara dist. and Belgaum, Bombay Pres.
- planifrons* Horn. Ceylon.
- plicaticollis* Chaud. Ceylon.
- plicicollis* Horn. Nilgiri Hills, Madras Pres.
- plicicollis* var. *subtile-flavescens* Horn.² Shembaganur, Madura dist., Madras Pres.
- punctatella* Chaud. Balangoda, Ceylon.
- redtenbacheri* Horn.³ Mungphu, Singla* (1,500 ft.), Ghumti (1,500—5,000 ft.), and Pashok* (1,000—3,500 ft.), Darjiling dist., E. Himalayas ; Simla and Kousanie* (6,075 ft.), Kumaon, W. Himalayas ; Nepal ; Bhutan ; Pinjore,* Patiala State, Punjab ; Khasi Hills, Naga Hills,* Patkai Hills, Tura* (200—1,500 ft.), and above Tura* (3,000 ft.), Garo Hills, Assam ; Arrakan,* Burma ; Tenasserim.
- roeschkei* Horn. Calcutta, Bengal.
- rubens* Bates. Assam (plains).

¹ Towler (1912, p. 268) apparently doubts the validity of this species. It is included in his volume on Dr. Horn's authority.

² Cf. Horn (1913, p. 4). Not recorded in the "Fauna."

³ Fowler (1912, p. 240) remarks that he is doubtful whether this is a distinct species, or only a variety of *N. attenuata*.

- rufipalpis* Chaud. Assam* ; Karen Hills, Burma ; Cambodia and Tonkin, Indo-China ; Sumatra ; Java.
- saphyrina* Chaud. Pashok* (2,500 ft.), Mungphu,* Darjiling dist., E. Himalayas ; Nepal Valley* (4,500—6,500 ft.), E. Himalayas ; Pedong, Bhutan ; Bengal ; Assam ; N. India.
- sarawakensis* Thoms. Sylhet,* Assam ; Burma ; Sumatra ; Borneo ; Malacca.
- sarawakensis* var. *dohertyi* Horn.¹ Burma ; Sumatra ; Siam ; Malacca.
- saundersi* Chaud. Kandy and Bandarawela and Kandy, Ceylon.
- saundersi* var. *continentalis* Horn. Wallardi, Travancore.
- saundersi* var. *laetior* Horn. Colombo, Kandy,* Korale and Morawak, Ceylon.
- schaumi* Horn. Andaman Is.*
- similis* Lesne. Nilgiri Hills, Madras Pres. ; Assam ; Laos, Indo-China ; Perak, Malay Peninsula.
- smaragdina* Horn. Soom* (4,000—5,000 ft.), Mungphu* and Kurseong,* Darjiling dist., E. Himalayas ; Bhutan.
- smithi* Chaud. (?) Tibet ; Dacca, E. Bengal ; Naga Hills* and Cachar, Assam ; Pegu,* Burma.
- subclavata* Chaud. (?) Kollar dist., Mysore and Nilgiri Hills, Madras Pres. ; Bengal ; Andaman Is.* ; Indo-China.
- subclavata* var. *andamana* Bates. Andaman Is.
- subtilis* Chaud. Palni Hills and Kodaikanal, S. India ; Karen Hills, Burma ; Siam ; Sumatra ; Java.
- subtilis* var. *brachycephala* Horn. Karen Hills, Burma.
- variicornis* Chaud. Upper Teesta Valley* (4,000 ft.), Sitong* (3,800—4,000 ft.), and Singla* (1,500 ft.), Darjiling dist., E. Himalayas ; Tura* (1,200—1,500 ft.), Garo Hills, Sylhet, Khasi Hills, Patkai Hills and Naga Hills, Assam ; Tharawaddy, Burma ; Bukit Besar,* Nawngchik (2,500 ft.), Siamese Malay States.
- variicornis* var. *flavolabiata* Horn. Andaman* and Nicobar Is.*
- variicornis* var. *gestroi* Horn. Karen Hills, Burma ; Tenasserim.
- variitarsis* Chaud. Darjiling, Singla* (1,500 ft.), and Sukna* (500 ft.), Darjiling dist., E. Himalayas ; Nepal ; Bengal ; Tura* (1,200—1,500 ft.), Garo Hills and Dunsiri Valley,* Assam ; Karen Hills and Teinzo, Burma ; Tenasserim ; Tonkin, Indo-China ; Penang.
- variitarsis* var. *brachycephala* Horn. Bhamo, Rangoon and Karen Hills, Burma.

Genus **Tricondyla** Latr. (1822).

- coriacea* Chev. Chilaw,* Kanthalai, Kekirawa, Palatupana and Trincomali, Ceylon.
- cyanea* var. *annulicornis* Schm.-Goeb. Pegu,* Burma ; Tenasserim ; Siam ; Cambodia.
- gestroi* Fleut. Sylhet, Assam ; Karenni (? Karen Hills), Burma ; Tonkin, and Cambodia, Indo-China.
- gounelli* Horn. Ramnad, Madura dist., and Anaimalai Hills (3,500—4,000 ft.), Madras Pres. ; Trivandrum, Travancore.

¹ According to Fowler (1912, p. 269) an examination of further specimens might necessitate the separation of this form as a distinct species.

- gounelli* var. *horni* Mndr. Travancore (mountains) and Trivandrum,* Travancore.
granulifera Mots. Haragaru and Nalanda, Ceylon.
granulifera var. *rugosa* Chaud. Ceylon.
macrodera Chaud. Sikhim* ; Darjiling,* Mungphu,* Ghumti* (4,000 ft.), Kalimpong* (600—4,500 ft.), Pashok* (2,000—3,000 ft.), Singla* (1,500 ft.), and Gopaldhara,* Rungbong Valley, Darjiling dist., E. Himalayas ; Bhutan* ; Tura* (1,500 ft.), and above Tura* (3,500—3,900 ft.), Garo Hills, Pasighat,* Sadiya dist., Sibsagar,* and Cachar, Assam ; Tonkin, Indo-China.
mellyi Chaud. Maini Mukh,* Chittagong Hill Tracts, Bengal ; above Tura* (3,500—3,900 ft.), Garo Hills and Silcuri, Cachar* dist., Assam ; Laos and Tonkin, Indo-China.
nigripalpis Horn. Centr. Ceylon.
tuberculata Chaud. Sylhet, Silcuri,* Cachar dist., Assam.

Genus **Derocrania** Chaud. (1860).

- agnes* Horn. Centr. Ceylon.
brevicollis Horn. Trichinopoly, Madras Pres.
concinna Chaud. Kandy,* Ceylon.
flavicornis Horn. Ceylon.
fusiformis Horn. Centr. Ceylon.
gibbiceps Chaud. Centr. Ceylon.
halyi Horn. Ceylon.
honorei Fleut. Ramnad, Madura dist., Trichinopoly and Trichur, Cochin State, Madras Pres. ; Kodaikanal, Palni Hills, S. India ; Bombay.
longesulcata Horn. Wallardi, Travancore ; Coonoor, Anaimalai Hills and Nilgiri Hills (4,500—6,000 ft.), Madras Pres. ; Castle Rock,* N. Kanara dist., Bombay Pres.
nematodes Schaum. Centr. Ceylon.
nietneri Mots. Balangoda Ridge, Kandy,* Ceylon.
schaumi Horn. Ceylon.
scitiscabra Walk. Kandy,* Ceylon.

Division **PLATYSTERNALIAE**.

Subfamily **THERATINAE**.

Genus **Therates** Latr. (1817).

- chenelli* Bates. Naga Hills (2,000 ft.), Assam ; Karen Hills and N. Shan States,* Burma.
chenelli var. *concinus* Gestro. Ruby Mines, U. Burma.
dohertyi Horn. Pashok* (5,000 ft.), Darjiling dist., E. Himalayas ; Patkai Hills, Assam ; Pegu, Burma ; Tenasserim.
dormeri Horn. Patkai Hills, Assam ; Borneo.
gestroi Horn. Khasi Hills and above Tura* (3,500—3,900 ft.), Garo Hills, Assam ; Lakhon, Lower Siam.

- gestroi* var. *annandalei* Horn. Kurseong* (4,700—5,000 ft.), Ghumti* (4,000 ft.), Pashok* (2,000, 4,000 and 5,000 ft.), Mahanadi (4,120 ft.),* and Kalimpong* (600—4,500 ft.), Darjiling dist., E. Himalayas.
- hennigi* Horn. Khasi Hills and above Tura* (3,900 ft.), Garo Hills, Assam.
- obliquus* Fleut. Pashok* (5,000 ft.), Darjiling dist., E. Himalayas ; Ruby Mines, U. Burma ; Momeit, Yunnan, W. China.
- waagenorum* Horn. Darjiling, E. Himalayas ; Pegu,* Burma ; Tenasserim.*

Subfamily CICINDELINAE.

Genus **Prothyma** Hope (1838).

- belloides* Horn. N. Kanara, Bombay.
- bouvieri* Horn. Maymyo, Burma ; Lakhon, Lower Siam.
- exornata* Schm.-Goeb. Tharawaddy, Pegu,* N. Chin Hills and Karen Hills, Burma ; Annam, Cambodia and Laos, Indo-China.
- feae* Gestro. Bhamo and Teinzo, Burma.
- hennigi* Horn.¹ Khasi Hills, Assam.
- inornata* Horn.² Kulu, Punjab, W. Himalayas ; Assam.
- limbata* Wied. Simla, Punjab and Jhelum Valley,* Kashmir, W. Himalayas ; Calcutta, Bengal.
- paradoxa* Horn. Mahe, W. coast, India ; Pondicherry and Kanara, Madras Pres. ; Trivandrum* and Karunagapalli,* Travancore ; Ceylon.*
- proxima* Chaud. Kurseong, Darjiling dist., E. Himalayas ; Dharwar, U. Provs. ; Ramnad, Kanara, Cocanada and Coimbatore,* Madras Pres. ; Balugaon,* Puri dist., and Cuttack,* Orissa ; Calcutta and Birbhum,* Bengal ; (?) Kathiawar, Bombay Pres. ; Nagpur, Central Provs.
- reconciliatrix* Horn. Dacca,* E. Bengal ; above Tura* (3,500 ft.), Garo Hills, Assam ; Tenasserim.
- schmidt-goebeli* Horn. (?) Bengal ; Gokteik, U. Burma ; Cambodia and Laos, Indo-China.
- scrobiculata* Wied. Maldah, Bengal ; Chota Nagpur, Bihar ; Balasore,* Orissa (sea-coast).

Genus **Heptodonta** Hope (1838).

- arrowi* Horn. Tavoy and N. Chin Hills, Burma.
- eugenia* Chaud. Bet. Yenang-Yaung and Mandalay, Bhamo, Teinzo and Tharawaddy, Burma ; Cochin China ; Siam ; Penang.
- ferrarii* Gestro.³ N. Shan States* and Karen Hills, Burma ; Cambodia, Laos and Tonkin, Indo-China.

¹ To quote Fowler (1912, p. 309) "this is a somewhat abnormal species and ought, perhaps, to be referred to *Heptodonta*." Further material might necessitate the erection of a separate genus for this species.

² Fowler (1912, p. 305) remarks that *P. inornata* and *P. feae* are in all probability subspecies of *P. limbata*.

³ Fowler (1912, p. 312) treats this species as a synonym of *H. pulchella*. See Dover and Ribeiro (1921, p. 723).

kraatzi Horn. Darjiling, Mungphu* (3,000—4,000 ft.), Ghumti* (1,500—5,000 ft.), Pashok* (2,000 ft.), and Singla* (1,500 ft.), Darjiling dist., E. Himalayas ; Khasi Hills and above Tura* (3,000—3,500 ft.), Garo Hills, Assam.

nodicollis Bates. Darjiling, Mungphu,* Pashok* (5,000 ft.), Sureil* (5,000 ft.), above Sureil* (5,500 ft.), Lebong* (6,000 ft.), and Kurseong* (5,000 ft.), Darjiling dist., E. Himalayas ; Shillong* (5,500—6,400 ft.), Khasi Hills, Assam ; Tonkin, Indo-China.

pulchella Hope. Darjiling, Mungphu,* Rungeet Valley* (700—800 ft.), and Gopaldhara,* Rungbong Valley, Darjiling dist., E. Himalayas ; Simla, Punjab, W. Himalayas ; Nepal ; Tura* (1,000—1,200 ft.), Garo Hills, Assam ; Karen Hills, Burma ; Yunnan, W. China.

Genus **Cicindela** Linn. (1735).

agnata Fleut. Kurseong, Darjiling dist., E. Himalayas ; Malabar, Ramnad, Madura dist. and Chounambar and Killinour, Pondicherry ; (environs), Madras Pres. ; Cuttack* (bank of R. Mahanadi), Sur Lake* and Balighai* near Puri, Orissa ; Asansol and Berhampur, Murshidabad dist., Bengal ; Chakardharpur,* Chota Nagpur, Bihar.

albina Wied. Darjiling, E. Himalayas ; Balighai* near Puri, Orissa ; Asansol, Bengal ; Lohardaga,* Chota Nagpur, Bihar ; Rawalpindi* (bank of R. Sohan), Punjab.

albopunctata Chaud. Sikhim* ; Darjiling, Mungphu, Ghoom* (7,500 ft.), and Kurseong, Darjiling dist., E. Himalayas ; Simla* and Kangra Valley* (4,500 ft.), Punjab, W. Himalayas ; Soondrijal,* Nepal ; Bhutan ; Chamusuri, Moradabad and Mussoorie,* U. Provs. ; Doiphang Valley,* Darrang dist., Assam-Bhutan Frontier.

andersoni Gestro. Karen Hills, N. Chin Hills, and Teinzo, Burma ; Cochin China.

andrewsi Horn. N. Kanara, Bombay Pres.

andrewsi var. *mauritii* Horn.¹ Sidapur,* Coorg, S. India ; N. W. Frontier Province.

andrewesi var. *unica* Fleut. “ Inde ” (Fleutiaux) ; “ Ex occidentali meridionali Indiae Orientalis Anticae ora ” (Horn) ; S. W. India.

angulata Fabr. Sikhim* ; Mungphu, Pankabari* and Sitong,* Darjiling dist., E. Himalayas ; Coromandel, Pondicherry (environs), and Ponear, Madras Pres. ; Cuttack* (bank of R. Mahanadi), Orissa ; Asansol, Calcutta,* Maldah,* Tetara, Damukdia,* Dacca, Bengal ; Chota Nagpur, Bihar ; Tura* (1,000 ft.), Garo Hills, Assam ; Pegu* and Sittaung R.,* Burma ; Karachi, Sind ; Hainan ; Annam and Cambodia, Indo-China.

angulata var. *plumigera* Horn. Mysore, Nilgiri Hills and Trichinopoly, Madras Pres. ; Cambodia, Indo-China ; Sumatra.

angulicollis Horn. Madura, Madras Pres. ; Kodaikanal and Tope,* foot of Palni Hills, S. India ; Dacca, E. Bengal.

¹ Referred to as a distinct species by Fowler, but we prefer to follow Horn (1915, p. 302) in regarding it as a variety of *andrewesi*.

- assamensis* Parry. Sikhim* ; Darjiling, Mungphu,* Gopaldhara,* Rungbong Valley, Pashok* (2,000 ft.) and Sukna* (500 ft.), Darjiling dist., E. Himalayas ; Tura* (1,200—1,500 ft.), and above Tura* (3,000 ft.), Garo Hills, Sylhet, Sibsagar, Nemotha* and Silcuri,* Cachar, Khasi Hills, Naga Hills* and Patkai Hills, Assam ; Arrakan,* Burma ; Penang.
- atkinsoni* Gestro. Rangoon and Karen Hills, Burma.
- atelesta* Chaud.¹ Mungphu and Kurseong, Darjiling dist., E. Himalayas ; Simla, Punjab, W. Himalayas ; Mysore, Madras Pres. ; Asansol and Calcutta, Bengal ; Chota Nagpur, Nowatoli and Ranchi, Bihar ; Sylhet, Assam ; Surat, Bombay Pres. ; Nagpur, Central Provs.
- aulica* Dej. Karachi,* Sind ; Persia ; Arabia ; Bagdad, Mesopotamia ; Brit. Somaliland ; Benguela ; Senegal ; Abyssinia ; Egypt ; Cape Verde Is. ; Angola ; Tunis ; St. Vincent ; Greece.
- aulica* subsp. *diania* Tsch. Baluchistan ; Sarhad and Bushire,* Persia.
- aurofasciata* Dej. Darjiling, E. Himalayas ; Travancore ; Mysore, Cochin, Ootacamund* (5,000—7,000 ft.), and Coonoor* (6,000 ft.) Nilgiri Hills,* Shimoga and Pondicherry, Madras Pres. ; S. India* ; N. Kanara, Bombay Pres.
- aurofasciata* var. *lepidula* Gory. Nilgiri Hills (2,500 ft.), Mysore, Bangalore* and Shimoga, Madras Pres. ; Belgaum and N. Kanara, Bombay Pres.
- aurofasciata* var. *seminigra* Fowl.² India.
- aurovittata* Brullé. Pondicherry and Barkuda Id.,* Madras Pres. ; Calcutta and environs,* Bengal ; Rangoon, Burma ; Ceylon ; Andaman Is.,* Nicobar Is. ; Philippine Is. ; (?) Centr. Japan.
- aurulenta* Fabr. Sikhim ; Mungphu* (3,000—4,000 ft.), Darjiling dist., E. Himalayas ; Chota Nagpur, Bihar ; Karen Hills, Tavoy,* Pegu* and N. Shan States,* Burma ; Tenasserim* ; Ceylon ; Singapore and Hills near Taiping,* Perak, Malay Peninsula ; Sarawak,* Sandakan* and Banguay Id., Borneo ; Java ; Tamansari* (1,600 ft.), Idjen Massip, E. Java ; Tonkin, Cambodia and Macao, Indo-China ; Siam ; Hong Kong ; Sinkep Id.,* off E. coast and Nias Id., Sumatra ; Formosa ; Lombok, E. Indies.
- aurulenta* var. *batesi* Fleut.³ Doiphang Valley,* Darrang dist., Assam-Bhutan Frontier ; Pegu, Burma ; Tonkin, Indo-China ; Formosa.
- aurulenta* var. *flavomaculata* Chevr. Mungphu, Darjiling dist., E. Himalayas ; Pegu, Burma ; Tenasserim ; Tonkin and Macao, Indo-China ; Hong Kong.*
- aurulenta* var. *virgula* Fleut. Sikhim* ; Kurseong, Ghumti* (4,000 ft.), Soom* (2,500—4,000 ft.), Pashok* (2,000 ft.), Singla* (1,500 ft.), Rungpo* (1,400 ft.), Rungeet Valley (100—800 ft.), Mungphu,* and Gopaldhara,* Rungbong Valley, Darjiling dist., E. Himalayas ;

¹ Cf. Horn (1915, p. 294). Fowler (1912, p. 358) treats this as a variety of *imperfecta*.

² Horn, *Genera Insectorum*, 1915, p. 304, seems to give this and the preceding form as synonyms of *aurofasciata*, but we prefer to follow Fowler in regarding them as varieties.

³ Not recorded in the "Fauna." Cf. Fleutiaux, *Ann. Soc. Ent. France*, p. 491, 1893.

Monda,* Nepal Terai; Chitlong,* little Nepal Valley; Bhutan; Buxa,* frontier of E. Bengal; Tura* (1,000—1,400 ft.), and Garo-badha,* Garo Hills, Naga Hills,* Sylhet, Sibsagar,* Silonibari,* and Dejoo,* N. Lakhimpur and Shillong* (5,500—6,400 ft.), Khasi Hills,* Assam; Teinzo, Burma; Tonkin and Cambodia, Indo-China; Hong Kong and Shanghai, China; Singapore, Malay Peninsula.

azureocincta Bates. N. Kanara, Bombay Pres.

bellana Horn. Karachi,* Sind; Fao, Persia.

bellana var. *nuda* Horn. Karachi, Sind.

belli Horn. Anaimalai Hills, Madras Pres.; Mahe, W. coast, India; Travancore; N. Kanara and Belgaum, Bombay Pres.

belli var. *umbropolita* Horn.¹ Teppukadu* (2,500—3,000 ft.), Karkur Ghat* (1,500 ft.), Coonoor and Ouchterlony Valley (2,500—5,000 ft.), Nilgiri Hills, Madras Pres.; Sidapur,* Margalli* and Pollibetta,* Coorg, S. India.

bicolor Fabr. Simla, Punjab and Dehra Dun, base of W. Himalayas; Calcutta (environs),* Maldah,* Pubna,* Murshidabad, Berhampur,* Birbhum,* Asansol and Sahibganj, Bengal; Khasi Hills, Assam; Burma.

bicolor var. *atavus* Horn.² N. India (Lashuwala).

bigemina Klug. Darjiling, Pankabari* and Kurseong,* Darjiling dist., E. Himalayas; Siliguri,* base of E. Himalayas; Punjab; Calcutta,* Maldah, Berhampur,* Murshidabad and Sara Ghat,* Bengal; Purneah dist.,* Chakardharpur,* Chota Nagpur, and Hazara,* Sarai Sateh, Bihar; Gwalior, Centr. India; N. Kanara, Bombay Pres.

bigemina var. *brevis* Horn. "India or." (Horn); Rawalpindi* (bank of R. Sohan), Punjab.

bigemina var. *iravaddica* Gestro. Mandalay, Katha, Teinzo and Tharawaddy, Burma.

bigemina var. *procera* Horn. "India or." (Boucard).

biramosa Fabr. Madras, Waltair,* Mandapam,* Madura dist., Chou-nambar, Pondicherry, Kanara,* Trichinopoly dist., and Pamben,* Madras Pres.; Tuticorin,* Srayikad* and Trivandrum, Travancore; Mahe, W. coast, India; Balighai* near Puri, Chandipore* near Balasore and Puri,* Orissa; Hughli River, Sunderbunds* and Chittagong, Bengal; (?) Assam; Arrakan,* Burma; Tenasserim; Mormugao,* Portuguese India; Trincomali,* Ceylon; Andaman Is.*; Nicobar Is.; Java; China; Malacca.

biramosa var. *contracta* Fleut.³ Rangoon, Burma; Tenasserim.

burmeisteri var. *stoliczkana* Bates. Jhelum,* Kashmir, N. W. Himalayas.

calligramma Schaum. Shimoga, Coimbatore, and Kanara,* Madras Pres.; Trivandrum,* Travancore; Tope,* foot of Palni Hills, S. India; Ceylon.

¹ Fowler in the Fauna gives this variety specific rank, but we prefer to follow Horn (1915, p. 291) in regarding it as a variety of *belli*.

² Not recorded in the "Fauna." Inserted here on the authority of Dr. Horn.

³ Described by Fleutiaux, *Ann. Soc. Ent. France*, 1893, p. 488, and regarded by Horn as a variety. Cf. *Genera Insectorum*, 1915, p. 308.

- cancellata* Dej. Kurseong and Sukna* (500 ft.), Darjiling dist., E. Himalayas; Siliguri,* base of E. Himalayas; Mysore, Trichinopoly, Malabar,* Killinour and Chounambar, Pondicherry and Cheria Id.,* Chilka Lake, Madras Pres.; Quilon* and Tuticorin, Travancore; Puri,* Sur Lake* and Balighai* near Puri, Orissa; Karachi, Sind; Berhampur,* Murshidabad, Asansol and Kunbir, Bengal; Nowatoli, Bihar; N. Kanara and Bombay,* Bombay Pres.; Mahe, W. coast, India; Garobadha,* Garo Hills, Assam; Tharawaddy, Leo* (1,170 ft.), Arrakan* and N. Chin Hills, Burma; Cambodia and Tonkin, Indo-China; Java.
- cancellata* var. *candei* Chevr. Pondicherry, and Trichinopoly, Madras Pres.; Mahe, W. coast, India; Hong Kong.
- cardoni* Fleut. Sikkim; Mysore, Chounambar and Pondicherry, Madras Pres.; Asansol, Bengal; Purulia* and Ghatkuri* (1,200 ft.), Manharpur, Singbhum dist., and Nowatoli,* Chota Nagpur, Bihar; Taloshi* (2,000 ft.), and Medha* (2,200 ft.), Yenna Valley, Satara dist. and N. Kanara, Bombay Pres.; Burma; Chilaw,* Ceylon.
- cariana* Gestro. N. Shan States,* U. Burma.
- catena* Fabr. Darjiling, E. Himalayas; Chatrapur,* Tindivanam, Villapouram, Coromandel, Pondicherry, Barkuda Id.* and Cheria Id.,* Chilka Lake, and Trichur, Cochin State, Madras Pres.; Quilon,* Travancore; Tope,* foot of Palni Hills, S. India; Calcutta,* Bengal; Chota Nagpur and Ranchi,* Bihar; Teinzo, Burma; Bombay; Mahe, W. coast, India; Karachi, Sind; Colombo,* Peradeniya,* Kandy and Matale, Ceylon.
- ceylonensis* Horn. Trincomali and Wellawaya,* Ceylon.
- ceylonensis* var. *diversa* Horn. Damboolla, Ceylon.
- chinensis* De Geer. Simla,* Punjab, W. Himalayas; Tonkin, Indo-China; Korea; Japan; China.*
- chlorida* Chaud. Malabar Coast, Podanur near Coimbatore, Madras Pres.; Tope,* foot of Palni Hills, S. India.
- chloris* Hope. Rungpo* (1,400 ft.), and Rungeet Valley* (700—800 ft.), Darjiling dist., E. Himalayas; Siliguri,* base of E. Himalayas; Gilgit* (4,400 ft.), and Srinagar* (6,000 ft.), Kashmir, W. Himalayas; Soondrijal,* Benikhola* and Kumdhik,* Nepal Terai; Kathgodam* (1,200 ft.), Kumaon, Hathikund* and Jumnagwar,* Ghurwal dist., Amangarh,* Patna,* Boxar,* Kaladhungi, Rudpur,* Bindukhera,* Bijrani,* Horai,* Jalaban* and Kiari,* Naini Tal dist., and Bhogpur,* Bijnor dist., U. Provs.; Rawalpindi* (bank of R. Sohan), Punjab; Mangaldai dist., N. E.,* Assam-Bhutan Frontier.
- chloropleura* Chaud. Pashok* (2,500—3,000 ft.), Kalimpong* (600—4,500 ft.), Rungeet Valley* (700—800 ft.), and Pashok Spur,* Darjiling dist., E. Himalayas; Simla, Punjab, W. Himalayas; Kashmir, N. W. Himalayas; Sylhet, Assam.
- cognata* Wied. Darjiling, E. Himalayas; Madras; Cuttack* (bank of R. Mahanadi), Orissa; Asansol, Berhampur and Goalbathan,* Bengal; Chota Nagpur, Bihar; (?) Cambodia, Indo-China.
- copulata* Schm.-Goeb. Karachi,* Sind.
- corbetti* Horn. Tharawaddy, Burma.

corticata Putz. Ramnad, Pondicherry, Mysore, Nilgiri Hills (1,250—3,500 ft.), and Trichinopoly, Madras Pres.; Trivandrum,* Travancore; Mahe, W. coast, India; Tope,* foot of Palni Hills, S. India; Ceylon.

corticata var. *laeticolor* Horn. Ceylon.

crassipalpis Horn. Podanur near Coimbatore (1,000 ft.), Madras Pres.

cyanea Fabr. Sahibganj, Bengal; Palkot,* Chota Nagpur, Bihar.

cyanea var. *dejeani* Hope. Berhampur* and Murshidabad, Bengal; Chota Nagpur, Bihar.

davisoni Gestro. Thagata, Tenasserim.

decempunctata Dej. Murshidabad,* Rajmahal* and Birbhum, Bengal; Assam; Rangoon and Palon, Burma; Cambodia and Tonkin, Indo-China.

decempunctata var. *obscure-dilatata* Horn.¹ Delhi and Lahore* (river-side), Punjab.

delavayi Fairm.² Mungphu, Darjiling dist., E. Himalayas; Yunnan, W. China.

delavayi var. *funebri* Schm.-Goeb. Sikhim*; Mungphu* and Kurseong,* Darjiling dist., E. Himalayas; Punjab; N. E. Frontier, Assam; Naga Hills (4,000 ft.), Assam; Karen Hills, Burma.

despectata Horn.³ Tavoy,* Burma; Philippine Is.; Perak,* Malay Peninsula.

discrepans Walk. Colombo, Kandy and Nalanda, Ceylon.

discrepans var. *lacrymans* Schaum. Kandy,* Ceylon; (?) Nias.

discreta Schaum.⁴ Assam; Cambodia; Simalur Id., and Nias Id., Sumatra; Java; 10 miles S. of Kuching* and Kapit,* Sarawak, Borneo; Celebes; Toe-Kang-Besi Is.; Buru, Siberia; Philippine Is.; New Guinea; N. Queensland.

discreta var. *reductula* Horn.⁵ Tura* (1,000—1,500 ft.), Garo Hills, Assam; N. Chin Hills, Burma; Sarawak, Borneo; Sumatra; Amboyna, Malay Peninsula.

dissimilis var. *singalensis* Horn.⁶ Ceylon.

distinguenda Dej. Barkuda Id.,* Lake Chilka, Madras, and Pondicherry, Madras Pres.; Mahe, W. coast, India; Ceylon.

distinguenda var. *lunulata* Horn. Madras.

dives Gory. Sikhim; Mysore, Madras Pres.; Bengal; Belgaum and N. Kanara, Bombay Pres.; Mhow, Centr. India.

dormeri Horn. Kandy,* Ceylon.

dromicoides Chaud. Darjiling, Ghumti* (4,000 ft.), Mungphu,* Soom to Darjiling (4,500—7,000 ft.), below Sureil* (4,800 ft.), and Kurseong,* Darjiling dist., E. Himalayas; Nepal; Simla, Punjab, Kumaon* and Kousanie* (6,075 ft.), U. Provs., W. Himalayas; Nowatoli and Chota Nagpur, Bihar; Khasi Hills, Assam; Bombay.

¹ Not recorded in the "Fauna." Cf. Horn, 1913, p. 28.

² Cf. Horn, 1915, p. 289 for this species and its variety.

³ Not recorded in the "Fauna." Horn (1915, p. 296) records it doubtfully from Perak, but we have specimens both from Tavoy in Burma and Perak in the Malay Peninsula.

⁴ This species is included here on the authority of Dr. Horn. Cf. Horn, 1915, p. 298.

⁵ Previously known as *reducta*. Cf. Horn, 1915, p. 298.

⁶ Not recorded in the "Fauna." Cf. Horn, 1915, p. 293.

- duponti* Dej. Merchiston* State near Trivandrum, Travancore ; Trichur, Cochin State, Nilgiri Hills, Mysore and Shimoga, Madras Pres. ; Coorg (2,000 ft.), S. India ; Bengal ; Chota Nagpur, Bihar ; Maflong,* Shillong, Cheerapunji,* Nongpriang,* and Maupun,* Khasi Hills, Tura* (1,000—1,400 ft.), Garo Hills, Sylhet and Patkai Hills,* Assam ; Arrakan, Pegu, N. Chin Hills, N. Shan States, Karen Hills and Tharawaddy, Burma ; Talewadi* near Castle Rock, N. Kanara dist., Bombay Pres. ; Mahe, W. coast, India ; Annam and Tonkin, Indo-China ; Penang ; Yunnan ; W. China.
- duponti* var. *barmanica* Gestro. Nilgiri Hills,* Madras Pres. ; Coorg* (2,000 ft.), S. India ; Sylhet and N. Manipur, Assam ; N. Shan States,* Karen Hills, Tharawaddy and Pegu,* Burma.
- erudita* Wied. (?) Tenasserim ; Kashmir and Kulu, W. Himalayas ; S. India* ; Maldah, Kierpur and Katihar, Purneah dist., Chota Nagpur and Pusa, Bihar ; Agra and Allahabad, U. Provs.
- fabriciana* Horn.¹ N. Kanara, Bombay Pres.
- fastidiosa* Dej. Kurseong, Darjiling dist., E. Himalayas ; Kashmir and W. Himalayas ; Dehra Dun, base of W. Himalayas ; Rawalpindi, Punjab ; Barkuda Id.,* Lake Chilka and Rambha,* Ganjam dist. and Mysore, Madras Pres. ; Nowatoli and Chota Nagpur, Bihar ; Assam* ; Pegu,* Burma ; Mhow, Centr. India ; Trincomali* and Anuradhapura (low country),* Ceylon.
- fleutiauxi* Horn.² Sikkim* ; Singla* (1,500 ft.), Ghumti* (1,500—5,000 ft.), Mungphu,* Gopaldhara,* Rungbong Valley and Kurseong, Darjiling dist., E. Himalayas ; Bengal.
- foveolata* Schaum. Malabar and Teppukadu* (3,000 ft.), Nilgiri Hills, Madras Pres. ; Dacca, E. Bengal ; Tura* (1,200 ft.), Garo Hills, Assam ; Karen Hills, Maymyo,* Teinzo and Tharawaddy, Burma ; Tonkin, Indo-China ; Celebes ; Sumatra ; Philippine Is.
- fuliginosa* Dej. Bhamo, Pegu* and Teinzo, Burma ; Ceylon ; Malay States ; Java ; Shanghai, China ; Borneo* ; (?) Banka, E. Indies ; Sumatra ; Laos and Cambodia, Indo-China ; Malacca.
- funerea* McLeay. Sikkim ; Darjiling, Gopaldhara,* Rungbong Valley, Mungphu, Pankabari, Kalimpong* (600—4,500 ft.), Singla* (1,500 ft.), Kurseong, Rungeet Valley* (700—800 ft.), Rungpo* (900 ft.), and Sukna,* Darjiling dist., E. Himalayas ; Soondrijal,* Nepal ; Simla, Punjab, W. Himalayas ; Mysore, Madras Pres. ; Barway, W. Bengal ; Sibsagar, Sylhet and Tura* (1,000 ft.), Garo Hills, Assam ; Doiphang Valley,* Darrang dist., Assam-Bhutan Frontier ; Allanmyo, N. Shan States,* Pegu,* Sadon* (5,000 ft.), Teinzo and Tharawaddy, Burma ; Tenasserim ; Poona, Bombay Pres. ; Ghatkuri* (1,200 ft.), Manharpur, Singbhum dist., Bihar* ; Hainan ; Lampam,* Patalung, Siam ; Perak,* Malay Peninsula ; Java* ; Sumatra ; Celebes ; Annam, Indo-China.
- ganglbaueri* Horn. Ceylon.

¹ Horn (1915, p. 303) gives this as a new name for *fabricii* Horn. Cf. Fowler, 1912, p. 403.

² Horn (1915, p. 303) gives this as a new name for *oberthuri* Fleutiaux. Cf. Fowler, 1912, p. 380.

- germanica* var. *kirilovi* Fisch.¹ Gilgit* (5,000 ft.), Kashmir, N. W. Himalayas ; Persia (up to Sarhad and Seistan in the south-east) ; Turkestan ; Kolyvan dist., Siberia ; Altai Mts., Mongolia ; Transcaspia.
- grammophora* Chaud. Mahanadi,* Darjiling dist., E. Himalayas ; Calcutta and environs,* Maldah,* Sara Ghat,* Damukdia,* Goalbathan* and Asansol, Bengal ; Katihar,* Purneah dist., Chota Nagpur, Pusa,* and Siripur,* Saran, Bihar ; Kaladhungi,* Naini Tal dist., U. Provs.
- guttata* Wied. Dehra Dun, base of W. Himalayas ; Shimoga and Ganjam, Madras Pres. ; Chapra,* Ranchi* and Lohardaga,* Bihar.
- gyllenhali* Dej. Bandra and Bassein, Bombay Pres. ; Karachi,* Sind ; E. Indies* (British Museum).
- haemorrhoidalis* Wied. Trivandrum, Travancore ; Nilgiri Hills, Mysore, Karkur Ghat, Malabar, Barkuda Id.* and Gantasila,* Lake Chilka, Madras Pres. ; Coorg, S. India ; Angul* and Barkul* (0—1,000 ft.), Orissa ; Calcutta, Bengal ; Ranchi and Lohardaga,* Bihar ; Sib-sagar,* N. E. Assam ; N. Kanara, Bombay Pres. ; Jubbulpore,* Centr. Provs. ; Rawalpindi,* Punjab ; Wellawaya,* Ceylon ; Canton,* China.
- haemorrhoidalis* var. *xanthospilota* Hope. Madras.
- hamiltoniana* Thoms. Nadgani,* Malabar, Mysore and Nilgiri Hills,* Madras Pres. ; Merchiston State* near Trivandrum, Travancore ; Pollibetta,* Coorg, S. India.
- helpferi* Schaum.² (?) Burma.
- histrion* Tsch. Karachi and Manora, Sind ; Khorassan, Seistan and Bampur, Persia.
- holosericea* Fabr. Asansol, Bengal ; Nowatoli, Chota Nagpur, Bihar ; Khasi Hills, Assam ; Karen Hills, Burma ; Java ; Sumatra ; Philippines.
- humillima* Gestro. Bhamo, Katha, Rangoon,* Shwegoo, Teinzo and Tharawaddy, Burma.
- indica* Fleut. Bombay.
- intermedia* Chaud. Jhelum Valley,* Kashmir, N. Punjab to Simla and Kumaon, W. Himalayas ; Kathgodam* (1,200 ft.), and Kousanie* (6,075 ft.), U. Provs. ; Assam.
- interrupto-fasciata* Schm.-Goeb. Teinzo, Ruby Mines and Maymyo, Burma ; Tonkin, Laos and Cambodia, Indo-China ; Hong Kong.
- kaleea* Bates.³ (?) Sikkim ; Assam ; Kiachou and Yunnan, China ; Formosa* ; Tonkin, Indo-China.
- lacunosa* Putz. Habarane* and Puttalam, Ceylon.
- lefroyi* Horn. Chapra and Pusa, Bihar.

¹ Horn (1915, p. 346) records this variety from Barkul. Now, as Barkul is in the Puri district of Orissa and is situated in south-east India we doubt this distribution, since the variety has been taken only in the north-west of India and is more especially known from central and south-western Asia.

² Horn, 1915, p. 309 regards *C. limbata* as a synonym of *C. helpferi* and doubtfully records its locality.

³ Included on the authority of Dr. Horn. Cf. Horn, 1915, p. 298.

- leucoloma* Chaud. Simla, Punjab, W. Himalayas ; (?) Ceylon ; " India " or " East India " ; N. India.
- limosa* Saund. Mungphu,* Darjiling dist., E. Himalayas ; Chandipore* near Balasore, Orissa ; Durgapur* (salt lakes) near Calcutta, Bengal ; Pegu,* Burma ; Ceylon ; Andaman* and Nicobar Is., Chusan Is.
- lunulata* Fabr. Nushki dist.,* W. Baluchistan ; Bagdad, Mesopotamia ; Caucasus ; S. Russia ; Lybia ; Abyssinia ; Morocco ; Corsica and Lampedusa Is., Italy ; Peking, China.
- lunulata* var. *nemoralis* Oliv. Perso-Baluch Frontier* ; Pamir ; Centr. Mongolia ; Seistan ; Turkestan ; Persia ; Syria ; Sinai ; Palestine ; Suez ; Islands of Rhodes, Crete, Cyprus, Malta, Elba, Sicily and (?) Sardinia ; Italy ; S. Europe.
- maindroni* Horn. Kiamari Id., Bombay Pres. ; Karachi,* Sind ; Baluchistan.
- malabarica* Maind. and Fleut. Mahe, W coast, India.
- mariae* Gestro. N. Chin Hills, Tharawaddy, Taung-ngu, Pegu,* Rangoon, and Karen Hills, Burma ; Tenasserim.
- melancholica* Fabr. Kalka* (2,400 ft.), base of Simla Hills, W. Himalayas ; Kaladhungi,* Naini Tal dist., U. Provs. ; Ambala,* Punjab ; Bengal ; Pusa,* Bihar ; Nagpur, Central Provs. ; Bandra, Bombay Pres. ; Karachi, Sind ; Bushire,* Persia ; Anatolia, Rhodes, Syria to Arabia, Caucasus to Turkestan ; the Islands of Cape Verde, Crete, Sicily, Sardinia, Fernando Po, Principe, St. Thomas, Annabon, (?) Comoro and Cephalonia, Greece ; the whole continent of Africa.
- minuta* Oliv. Darjiling and Pashok* (1,000 ft.), Darjiling dist., E. Himalayas ; Trichur, Cochin State and Pondicherry, Madras Pres. ; Cuttack (bank of R. Mahanadi), and Dhauli,* Puri dist.,* Orissa ; Calcutta,* Dacca, Berhampore and Maldah,* Bengal ; Chakardharpur,* Chota Nagpur, Chapra, and Pusa,* Bihar ; Garobadha* and Tura* (1,000 ft.), Garo Hills, Assam ; Pegu* and Tharawaddy, Burma ; Myawadi* (900 ft.), Burmo-Siamese Frontier, Amherst dist. ; Patan* (2,050 ft.), Koyna Valley, Satara dist., Bombay Pres. ; Mahe, W. coast, India ; Delhi,* Punjab ; Sumbawa, Sumatra ; Perak,* Malay Peninsula ; Tonkin, Indo-China ; Borneo ; Java ; China ; Philippines.
- motschulskyana* Horn.¹ N. Kanara, Bombay Pres.
- mouhoti* var. *anometallescens* Horn. Maymyo and Ruby Mines, Burma ; Momeit, Yunnan, W. China.
- mouhoti* var. *bramani* Dokht. Pegu, Burma ; Lukhon, Siam ; Laos and Tonkin, Indo-China ; China (proper).
- mouhoti* var. *cariana* Gestro. N. Shan States and Karen Hills, Burma ; Tenasserim.
- mouhoti* var. *goebeli* Horn. Bhamo, Rangoon and Teinzo, Burma.
- multiguttata* Dej. Nepal ; Calcutta,* Asansol and Sara Ghat,* Bengal ; Patkai Hills, Assam.
- mutata* Fleut. Bhamo, Pegu, Teinzo and Tharawaddy, Burma ; Tonkin, Indo-China.

¹ Horn (1915, p. 289) gives this as a new name for *motschulskyi*. Cf. Fowler, 1912, p. 342.

nietneri Horn. Ceylon.

nitida Wied. Darjiling and Kurseong, Darjiling dist., E. Himalayas ; Bhutan ; Pondicherry and Ramnad, Madras Pres. ; Cuttack* (bank of R. Mahanadi), Orissa ; Berhampur* (bank of R. Bhagarati), Calcutta,* Maldah,* Sara Ghat,* Rajmahal,* Asansol and Jugge-nathgunge* (R. Brahmaputra), Bengal ; Kaladhungi,* Naini Tal dist., U. Provs. ; Chota Nagpur, Bihar ; Pegu,* Burma ; Karachi, Sind ; Cambodia, Indo-China.

octogramma Chaud. Dharhar, Bengal ; Dinapur, Bihar ; Kangra Valley, Punjab ; Yunnan, W. China.

octonotata Wied. Darjiling,* Pankabari* and Sukna* (500 ft.), Darjiling dist., E. Himalayas ; Simla, Punjab, W. Himalayas ; Agra, U. Provs. ; Asansol, Dacca, Maldah,* Murshidabad and Miani Mukh* (at junction of Miani and Kassalong Rivers), Chittagong Hill Tracts, Bengal ; Pusa,* Bihar ; Tura* (1,200 ft.), and Garobadha,* Garo Hills, Khasi Hills, Lushai Hills,* Sylhet and Sib-sagar,* Assam ; Jamayi, Pegu* and Tharawaddy, Burma.

ornata Fleut. Karachi,* Sind.

phalangioides Schm.-Goeb. N. Chin Hills, Karen Hills, Pegu* and Teinzo, Burma.

princeps Vig. "Indien," Surada (Ganjam) [Horn] ; (?) Madras ; Centr. India.

princeps var. *ducalis* Horn. Palkot,* Chota Nagpur, Bihar.

prothymoides Horn. Karkur Ghat, Malabar, Madras Pres.

quadrilineata Fabr. Chounambar, Madras Pres. ; Chandipore* near Bala-sore, Orissa sea-coast ; Sunderbunds, Gangetic delta and Channel Creek* near Mud Point, Bengal ; Arrakan, Burma ; Tenasserim ; Dabhol,* Koltharen* and Harni,* Ratnagiri dist., Bombay Pres. ; Cacara Bay,* Portuguese India ; Baluchistan ; Manofa, Karachi, Sind ; Ceylon to North India.

quadrilineata var. *renei* Horn. Trichinopoly and Pamben,* Madras Pres. ; Karachi, Sind ; Baluchistan ; Ceylon.

rugosiceps Chaud. Nilgiri Hills, Ramnad, Pillar, Mysore and Coonoor (2,500—3,500 ft.), Madras Pres.

seriepunctata Horn. Kalimpong* (600—4,500 ft.), Pashok* (2,000 ft.), Singla* (1,500 ft.), Rungeet Valley* (700—800 ft.), and Kurseong, Darjiling dist., E. Himalayas ; N. Bengal.

sexpunctata Fabr. Sikhim* ; Mungphu, Darjiling dist., E. Himalayas ; Raxaul,* Nepal Frontier ; Gilgit,* Kashmir, N. W. Himalayas ; Bangalore* and Shimoga, Madras Pres. ; Coorg, S. India* ; Calcutta* and environs,* Sunderbunds, Diamond Harbour,* Bosondhar, Berhampur, Birbhum, Raniganj,* Damukdia,* Maldah,* Alipur Duars,* Sara Ghat,* Khargpur* and Basanti,* Bengal ; Purneah, Ranchi,* Champaran,* and Chota Nagpur, Bihar ; Sadiya,* and Shillong,* Assam ; Rangoon,* Pegu, Sittaung River, Arrakan,* delta of the Irrawaddy,* Kawkareik* and Farm Caves* near Moulmein, Burma ; Bombay ; Mahe, W. coast, India ; Wellawaya* and Peradeniya,* Ceylon ; Andamans ; Siam ; (?) Java ; Annam to Hong Kong ; E. Indies* ; Cambodia, Indo-China ; Formosa ; Philippines ; Senegal and Cameroon, Africa.

- shivah* Parry. Nepal ; N. Kanara, Bombay Pres. ; (?) Assam.
- sinica* Fleut. Taik-gyi, Pegu, Burma ; Saigon and Chiem Hoa, Tonkin, Indo-China ; Bangkok, Siam ; Java ; Hong Kong.
- spinolae* Gestro. Darjiling, Pashok* (1,000, 2,000 and 5,000 ft.), Singla* (1,500 ft.), Rūngeet Valley* (700—800 ft.), and Sukna* (500 ft.), Darjiling dist., E. Himalayas ; Dehra Dun, W. Himalayas ; Asansol, Dacca and Rangamati,* Chittagong Hill Tracts, Bengal ; Sylhet, Patkai Hills and Tura* (1,000—1,500 ft.), Garo Hills, Assam ; N. Chin Hills, Bhamo, Teinzo, Tharawaddy, Karen Hills, Ruby Mines, and Rangoon, Burma ; Tenasserim ; Chota Nagpur, Bihar ; Tonkin, Indo-China ; Momeit, Yunnan, W. China.
- striatifrons* Chaud. Murshidabad* and Berhampur,* Bengal ; N. Kanara, Bombay Pres.
- striolata* Ill. Mungphu* Soom* (3,000—3,500 ft.), and Pashok* (3,000 ft.), Darjiling dist., E. Himalayas ; Dehra Dun, base of W. Himalayas ; Trivandrum,* Travancore ; Nilgiri Hills and Kanara,* Madras Pres. ; Pollibetta* and Coorg, S. India ; Calcutta, Maldah* and Rangamati,* Chittagong Hill Tracts, Bengal ; Khasi Hills, Assam ; Pegu,* Teinzo and Tharawaddy, Burma ; Tenasserim ; Chota Nagpur, Bihar ; Mahe, W. coast, India ; Tonkin, Indo-China ; Singtau, China ; Java ; Borneo ; Sumatra ; Celebes ; Formosa ; Philippines.
- striolata* var. *lineifrons* Chaud. Dehra Dun, base of W. Himalayas ; Nilgiri Hills, Madras Pres. ; above Tura* (2,500 ft.), Garo Hills, Assam ; N. Chin Hills, Karen Hills, Pegu,* Teinzo and Tharawaddy, Burma ; Tenasserim ; Perak, Malay Peninsula ; Cambodia and Tonkin, Indo-China.
- striolata* var. *parvimaculata* Fowl.¹ (?) Darjiling, E. Himalayas.
- sublacerata* var. *balucha* Bates. Skardo, Kashmir, N. W. Himalayas ; Baluchistan ; Perso-Baluch Frontier* ; Caucasus ; Armenia ; Transcaspia ; Turkestan (to Ferghana and the Pamirs).
- sumatrensis* Hbst. Siliguri,* base of E. Himalayas ; Kumdhik, Maho,* Nepal Terai ; Kashmir, N. W. Himalayas ; Trivandrum, Travancore,* Telicherry, Pondicherry, Barkuda Id.* and Cheria Id.,* Lake Chilka, Madras Pres. ; Cuttack,* Orissa ; Calcutta,* Damukdia,* Maldah and River Ganges, Bengal ; Bhamo, N. Chin Hills, Pegu, Tavoy, Teinzo and Tharawaddy, Burma ; Tura* (1,000 ft.), Garo Hills, Assam ; Chakardharpur,* Singbhum dist. (base of hills), Chota Nagpur, Ranchi and Purulia,* Bihar ; Patan* (2,050 ft.), Koyna Valley, Satara dist., and Khandesh, Bombay Pres. ; Mahe, W. coast, India ; Cacara Bay,* Portuguese India ; Bhogpur,* Bijnor dist., U. Provs. ; Karachi, Sind ; Ceylon ; Hainan, Quang-Tang and Yunnan, China ; Central China* ; Perak, Malay Peninsula ; (?) Java ; Borneo ; Japan ; Formosa ; Sumbawa. E. Indies ; Sumatra ; Philippines ; Sinkep Id.*
- sumatrensis* var. *imperfecta* Horn. Mussoorie,* W. Himalayas ; Forest Tramway, mile 10—14* (0—300 ft.), Cochin State, Shimoga and

¹ Horn (1915, p. 305) classes this as a separate species but we prefer for the present to follow Fowler in regarding it as a variety.

- Mysore, Madras Pres. ; Ranchi,* Bihar ; Castle Rock,* N. Kanara dist., Pimpri,* Vashishti Valley (100 ft.), Ratnagiri dist., and Medha* (2,200 ft.), Yenna Valley, Helvak* (2,000 ft.), Taloshi* (2,000 ft.), Patan* (2,050 ft.), Koyna Valley, Satara dist., and Surat,* Bombay Pres. ; Jubbulpore,* Centr. Provs.
- tetragrammica* Chaud. Anaimalai Hills* (3,000—4,000 ft.), Malabar Coast, Nilgiri Hills, Ramnad, Shembaganur and Trichinopoly, Madras Pres. ; Pykara (6,000 ft.), Coorg, S. India ; S. Bombay.
- tetrastacta* Wied. Ganjam, Gantasila* and Barkuda Id.,* Lake Chilka, Madras Pres. ; Asansol, Birbhum,* Calcutta,* River Ganges,* Bengal ; Nowatoli and Chota Nagpur,* Bihar ; Dharwar, Bombay Pres.
- triguttata* Hbst. Darjiling dist. (600—4,500 ft.), and Kalimpong* (600—4,500 ft.), E. Himalayas ; Siliguri,* base of E. Himalayas ; Dehra Dun, base of W. Himalayas ; Calcutta* and Rangamati,* Chittagong Hill Tracts, Bengal ; Tura* (1,300 ft.), Garo Hills, Assam ; Bhamo, Karen Hills, Pegu,* Taung-ngu, Teinzo and Tharawaddy, Burma ; Tenasserim ; Hong Kong and Shanghai, China ; Sumbawa, E. Indies ; Borneo ; Sumatra ; Tonkin, Indo-China ; Singapore ; Malay Archipelago ; Celebes ; Philippines.
- tritoma* Schm.-Goeb. Karen Hills and Pegu, Burma.
- undulata* Dej.¹ Barkuda Id.,* Gopkuda Id.* and Samal Id.,* Lake Chilka, Mysore and Ramnad, Madras Pres. ; Balugaon,* Puri dist., Orissa ; Asansol, Calcutta,* Dacca, and Maldah* Bengal ; Nowatoli and Lohardaga,* Bihar ; Sylhet, Assam ; Gulistan,* Baluchistan ; Mahe, W coast, India ; Gwalior, Centr. India ; Allahabad, U. Provs. ; Ceylon ; Hong Kong ; Perak, Malay Peninsula.
- undulata* var. *dubia* Horn. Singla* (1,500 ft.), and Darjiling, Darjiling dist., E. Himalayas ; N. Assam ; Pakokku* (180 ft.), Mandalay, and Myingyan,* Burma.
- venosa* Koll. Kurseong and Darjiling, E. Himalayas ; Kashmir, N. W. Himalayas ; Bhutan ; Pondhicherry and Ramnad, Madras Pres. ; Cuttack, Orissa ; Berhampur, Calcutta, Maldah, Rajmahal and Sara Ghat, Bengal ; Pegu, and Hmawbi,* Burma ; Patna dist. and Chota Nagpur, Bihar ; Karachi, Sind ; Kaladhungi, U. Provs. ; Cambodia, Indo-China.
- venus* Horn. Nadgani, Malabar and Nilgiri Hills, Madras Pres.
- venus* var. *stuprata* Horn.² Travancore.
- vigintiguttata* Hbst. Sikhim ; Kurseong* (5,000 ft.), Mungphu* (3,000—4,000 ft.), and Pankabari,* Darjiling dist., E. Himalayas ; Bhutan* ; Barkul,* Puri dist., Orissa ; Berhampur,* Birbhum,* Dacca, Damukdia Ghat,* Murshidabad,* Rajmahal* and Sara Ghat,* Bengal.
- viridicincta* Horn. Dehra Dun, base of W. Himalayas ; Mysore, Kanara and Nilgiri Hills (3,000 ft.), Madras Pres. ; Pollibetta,* Coorg, S. India ; Chota Nagpur, Bihar.

¹ Cf. Annandale and Dover (1921, p. 336) and Dover and Ribeiro (1921, p. 724),

² Not recorded in the Fauna. Cf. Horn (1915, p. 287).

- viridilabris* Chaud. Kalka* (2,400 ft.), and Simla, Punjab, W. Himalayas; Bengal; Pusa,* Bihar; East Indies.
- viridilabris* var. *fallaciosa* Horn. Karen Hills and Teinzo, Burma.
- viridilabris* var. *fusco-cuprascens* Horn. Nilgiri Hills (1,250 ft.), and Trichinopoly, Madras Pres.
- viridilabris* var. *labioaenea* Horn. Colombo, Kandy,* Negombo, Pattalam and Peradeniya, Ceylon.
- viridilabris* var. *severini* Horn. Travancore and Nilgiri Hills* (3,000 ft.); Madras Pres.; Pollibetta,* Coorg, S. India; Bengal; Teinzo, Burma; Mahe, W. coast, India; Chota Nagpur, Bihar; Tonkin, Indo-China.
- vittigera* Dej. Berhampur, Calcutta, Dacca, Damukdia Ghat,* Goalbathan* and Maldah,* Bengal.
- waterhousei* Horn. Ceylon.
- westermanni* Schaum. Coromandel, Madras and Tranquebar, Madras Pres.
- withilli* Hope. Trichur, Cochin State, Anaimalai Hills (3,000—4,000 ft.), Coonoor (environs), N. Malabar,* Nilgiri Hills,* Ootacamund, and Wyanaad, Madras Pres.; Wallardi, Travancore; Mahe, W. coast, India; Talewadi* near Castle Rock, N. Kanara dist., Belgaum, Khanapur and Poona,* Bombay Pres.; Tharawaddy, Burma.
- willeyi* Horn. Central Provinces, Ceylon.

Genus **Apteroessa** Hope (1838).

- grossa* Fabr. Tranquebar, Coromandel Coast, Madras Pres.

Subfamily MEGACEPHALINAE.

Genus **Megacephala** Latr. (1802).

- euphratica* Dej. Karachi, Sind; Persia; R. Euphrates, Mesopotamia; Sinai; (?) Syria; Caucasus; Andalusia; Gulf of Tadjura; Cyprus; Rhodes; Cartagena; Egypt and Algeria to Tripoli, Africa.
- euphratica* var. *armeniaca* Cast.¹ Agra, U. Provs.*; Afghan-Baluch Frontier*; Armenia and Transcaspia to Amu Daria; Seistan,* Persia.

¹ It is also found in the same localities as the above specie.

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