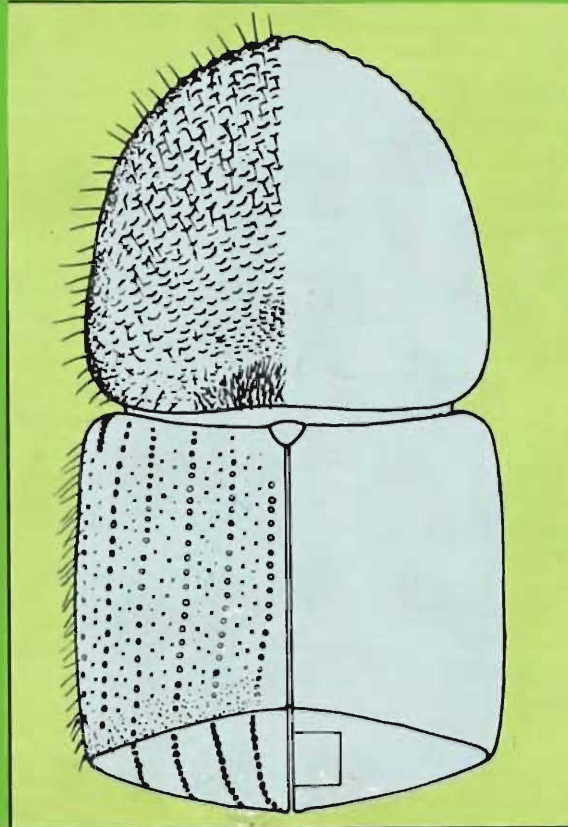


# *Fauna of India*



## **SCOLYTIDAE : COLEOPTERA**

**(BARK-AND AMBROSIA-BEETLES)**

**Volume : I (Part-1)**

**PARBODH K. MAITI  
NIVEDITA SAHA**

This volume on Scolytid-Beetles (Scolytidae : Coleoptera), commonly known as 'Bark- and Ambrosia-Beetles' deals with taxonomic accounts of species occurring in India. In spite of their both beneficial and harmful roles to forestry and forest products, these insects are well known pests, especially in the temperate forests.

The family Scolytidae contains about 270 species (World species) in India, of which only the tribe Xyleborini containing 97 species under 15 genera dealt in the first part of the current volume. The rest of the Indian species will be dealt in the second part of this volume very soon. Each species has been dealt with its current name, synonymy, description, keys, distribution, host-record, remarks, etc. Besides, this contains some general aspects, such as, Introduction, History, Classification, Zoogeography, Biology, Ecology, Control, etc.





**FAUNA OF INDIA  
AND  
THE ADJACENT COUNTRIES**

**SCOLYTIDAE : COLEOPTERA**

**(BARK- AND AMBROSIA-BEETLES)**

**VOLUME : I (PART-1)**

**INTRODUCTION AND TRIBE XYLEBORINI**

**PRABODH K. MAITI**

**NIVEDITA SAHA**

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*Edited by the Director, Zoological Survey of India, Kolkata*



सत्यमेव जयते

**Zoological Survey of India  
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## FOREWORD

'Bark- and Ambrosia-Beetles' of the family Scolytidae, order Coleoptera are well known for their beneficial and harmful role. These beetles are involved in the growth and productivity by recycling plant material by natural pruning process, on the other hand, a few of them affect the growth and deteriorate the timber condition thus ceasing enarmous damage to the timber value. Such an important group remained taxonomically unworked so far in India which has been successfully done in the present volume.

The present volume on Coleoptera deals with the taxonomic description of 97 species of Bark- and Ambrosia-Beetles distributed in 16 genera of the family Scolytidae. Besides taxonomic account, emphasis has also been laid on zoogeography, phylogeny, economic importance, biology and ecology along with their current status.

Hope, this fauna volume will serve as the store-house of information on the group to future workers both in India and abroad, especially to the Forest Entomologist.

January, 2004  
Kolkata

**J. R. B. Alfred**  
*Director*  
Zoological Survey of India



## **PREFACE**

Scolytids, commonly known as bark- and ambrosia-beetles belong to the Coleopterous family Scolytidae. The group is very much fascinating due to their subsocial behaviour, ecological adjustment with trees and fungi, hidden mode of life and lastly, for the importance in destroying forest and forest products especially wood in its many forms. The group being taxonomically difficult, ecologically and biologically complicated and for many other difficulties, has not been studied seriously in the past in India. However the present authors take the opportunity to study the taxonomy of these beetles resulting into writing up the fauna. The entire study is largely based on the excellent collection of Forest Research Institute, Dehra Dun, which has been further augmented by some material present in the Zoological Survey of India, Kolkata. The scrutiny of literature shows the occurrence of about 270 species in India alone, while the World fauna has been estimated at about 6000 species all together.

In considering the magnitude of species in India, it has been proposed to write the fauna in two parts. The first part deals with the general aspects of the group, namely, Introductory part, History, Biology, Ecology, Control, Distribution and Zoogeography, Generic Key, etc. including the taxonomic treatment of the tribe Xyleborini. The second part will be dealt with the taxonomic features of Non-Xyleborini group.

August, 2001

**P. K. Maiti**

**N. Saha**

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**P. K. Maiti**

**N. Saha**

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## INTRODUCTION

**General** : The sustainable conservation of nature and natural resources is an urgent need of the day to safeguard our own survival as well as our planet. One of the most important areas of conservation is the biological diversity contained in the forest which regulates essential ecological processes (Life supporting system), conserves our rich wildlife and lastly, involves directly in our economy. Such useful forest community is constantly deteriorated by insects including other natural agents. Among known forest insects, the Bark and Ambrosia beetles belong to the coleopterous family Scolytidae are very much important directly or indirectly deteriorating the productivity and usefulness of forest and forest products.

Scolytid beetles spend their entire life in the wood in its many forms in search of food and shelter. They are small insects measuring about 0.90-10.0 mm and generally escape the notice of collectors due to their cryptic habit. These beetles are one of the most fascinating groups of unique insects, essentially because of their subsocial organization, primitiveness in origin, cryptobiotic and phytophagous nature of life, unique ecological adjustment with fungus and lastly, for their economic importance. Further, it is realised now-a-days that every minor organism has a part to play and a niche to occupy in the ecosystem. This is true for these beetles also.

Economically, these beetles both in their larval and adult stages usually cause considerable damage to live, dead and dying trees in the forest stands, to felled logs in the extraction centres, etc.

As such, bark-and ambrosia-beetles are considered as secondary pest since they breed in trees of subnormal physiological condition instead of completely healthy plants in full vigour. However, under outbreak condition, many of these secondary pest invade and kill trees of normal health.

There is no doubt that these beetles are economically important, taxonomically difficult, biologically complicated and ecologically well adjusted. As such, they have challenged the curiosity of researchers in various fields of biological research as evidenced from huge published literature on these insects.

The experience of limitation and difficulties of traditional insecticidal control, has now-a-days led to a unifying concept that the sound ecological basis of pest suppression is the most rewarding venture to manipulate their population to keep them below the threshold level of their damage.

Hence, the recognition and correct identity of these beetles impel urgency of taxonomic study which are the prerequisite of any type of research on the group.

This keeping in view, the taxonomic study was undertaken which had hardly been studied earlier thoroughly in India. Such serious lacuna obviously remains due to

manifold reasons. (i) No serious study had been undertaken earlier, although an excellent collection had been accumulated at the F.R.I., Dehra Dun; (ii) Identification of stray collections worked out by the foreign experts mostly had appeared in foreign languages; (iii) No key for the identity of different taxa was made available; (iv) No catalogue or check-list was available on Indian fauna; (v) Updating of nomenclature in the light of modern classification (Wood, 1978, 1982; and Wood and Bright, 1992a and b) had hardly been made earlier.

To fill up these lacunae, the present authors devote to study the Indian fauna with regard to its taxonomic status, chronological synonymies, diagnostic and biological remarks, etc. Apart from these, running keys have been prepared for easy identity of the different taxa. Almost each and every species is well illustrated. Further, extensive bibliography is the added feature of the present volume.

The species dealt herewith are mainly based on the characters of the females which are more common than males. Males are hardly available in the collections, as such, general characters of the genera based on males could not be furnished.

Each species is fully described keeping in view of the meagre description available in the old literature and that too mostly in languages other than English.

**Recognition** : The scolytidae are subsocial, cylindrical to hemispherical, small to medium size subrostrate or non-rostrate beetles measuring about 0.90-10.0 mm in length. The colour varies from brown to black and vestiture from long silky hairs to minute dusty scales. Heads are generally globose, sometimes weakly to strongly narrowed anteriorly. Pregular suture and pregular scerite on ventral surface of head one distinct. Antennae are geniculate with 3-10 segments, and are divided into scape, funicle and club of varied shapes. Funicular segments vary between 3-7 segments and the club is formed of 3 segments which have immense importance in generic isolation.

The shape of the pronotum varies from oval to elongate or cylindrical to subquadrate with exceeding varieties of the asperities on the surface oriented in different patterns. The scutellum varies from suboval to tongue-shaped, sometimes depressed, roughened and not visible at all.

The shape of the elytra varies from short and stout to long and cylindrical ones with lateral margins outcurved or subparallel, whence terminating into narrowly to broadly rounded apices. The shape, size, vestiture, etc. of both disc and declivity vary considerably which have great taxonomic importance.

The tibial characters are widely used in the classification of tribes, particularly the tibial spines.

Immense morphological variations have taken place in the group due to their tunnelling habit in the bark and wood. Different body parts have been adapted for excavation, transportation and ejection of the boring dust or frass. Modification for

scraping and shovelling has taken place in the declivity of the elytra which are truncate or impressed, and furnished with spines and teeth (Beeson, 1941). The males are quite different in shape and size in comparison to females. Males are degenerated to a blind frail and flightless dwarf.

The larvae of scolytid-bettles are closely allied to curculionid larvae of apodus type. Considerable diversity of habitats leads to structural modification as seen in the adult forms.

**Taxonomic Position** : There are four suborders in the Order Coleoptera, of which the Polyphaga is by far the largest and most specialized one. Polyphaga contains 18 superfamilies, of which the Curculionoidea or Rhynchophora is a largest and highly evolved. The family Scolytidae formerly considered as a subfamily along with closely related subfamily Platypodidae (now family), has been kept under the superfamily Curculionoidea. These two families are generally differentiated by the following characters as devised in the key.

**Diagnosis of the Families** : The family Scolytidae along with its closest family Platypodidae arose as a monophyletic unit from the segment of Superfamily Curculionoidea having two gular suture. These families possess some common characters, such as, preular suture, a distinct preular sclerite between median gular suture and labial articulation (Fig. 9). However, these families can be separated based on the following key :

1. Tarsal segment 1 generally not longer than segment 2 or 3 (Fig. 4,b); head distinctly narrower than pronotum, generally concealed under the pronotum in dorsal view; antennal club with or without any suture; apical mucro on protibia formed primitively from mesal apical process; lateral denticles on protibia generally socketed ..... Scolytidae

Tarsal segment 1 as long as 2-5 combined together (Fig. 4,a); head as wide as pronotum; pronotum usually with a distinct lateral constriction near the middle; antennal club without sutures; apical mucro on protibia formed primitively from middle apical process; lateral denticles on protibia never socketed.....Platypodidae

However, the Scolytidae and Platypodidae are unique among the curculionoids with one median gular suture with having a distinct preular suture which differentiates a preular sclerite immediately behind the oral area on the ventral surface of the head.

These two families occupy specific ecological niche as subcortical borers. The ambrosial habit, that is common with Platypodidae, has evolved apparently independently, in 3 of 11 tribes of Hylesininae and in 5 of 14 tribes of Scolytinae. The two groups intergrade anatomically, behaviourally and ecologically, showing their close relation, but still have been retained separately, unless their respective status is fully investigated in future (Wood, 1982).

## GENERAL MORPHOLOGY

(Fig. 1)

**Body, shape, size and colour** : Body usually varies from board to elongate in shape. The overall size varies from minute to fairly large, the smallest species (in the genera *Hypothenemus* Westwood, *Pityophthorus* Eichhoff and *Crypturgus* Erichson) are measuring about 0.90 mm and the largest species (*Dactylipalpus transversus* Chapuis) is measuring nearly 10.00 mm.

Colour varies from unusually dark reddish brown to deep black when mature. All the species are generally yellowish brown when first transformed and turn darker as the integument becomes more strongly chitinized.

**Head** : Heads are generally globose, weakly to strongly narrowing anteriorly. The subrostrate feature is common in the tribes Hylesinini and Hyorrhynchini, and in the males of Scolytoplatypodini. Frontal surface is either concave or convex or flat and is sculptured with punctures, granules or carinulae (e.g. *Coccotrypes* Eichhoff, partly). Heads in males in some species of the tribe Xyleborini are generally reduced and remain concealed beneath the pronotal projection.

**Antennal insertion** : The antennal insertion varies in position from near the base of the mandibles to near the emargination of the eyes.

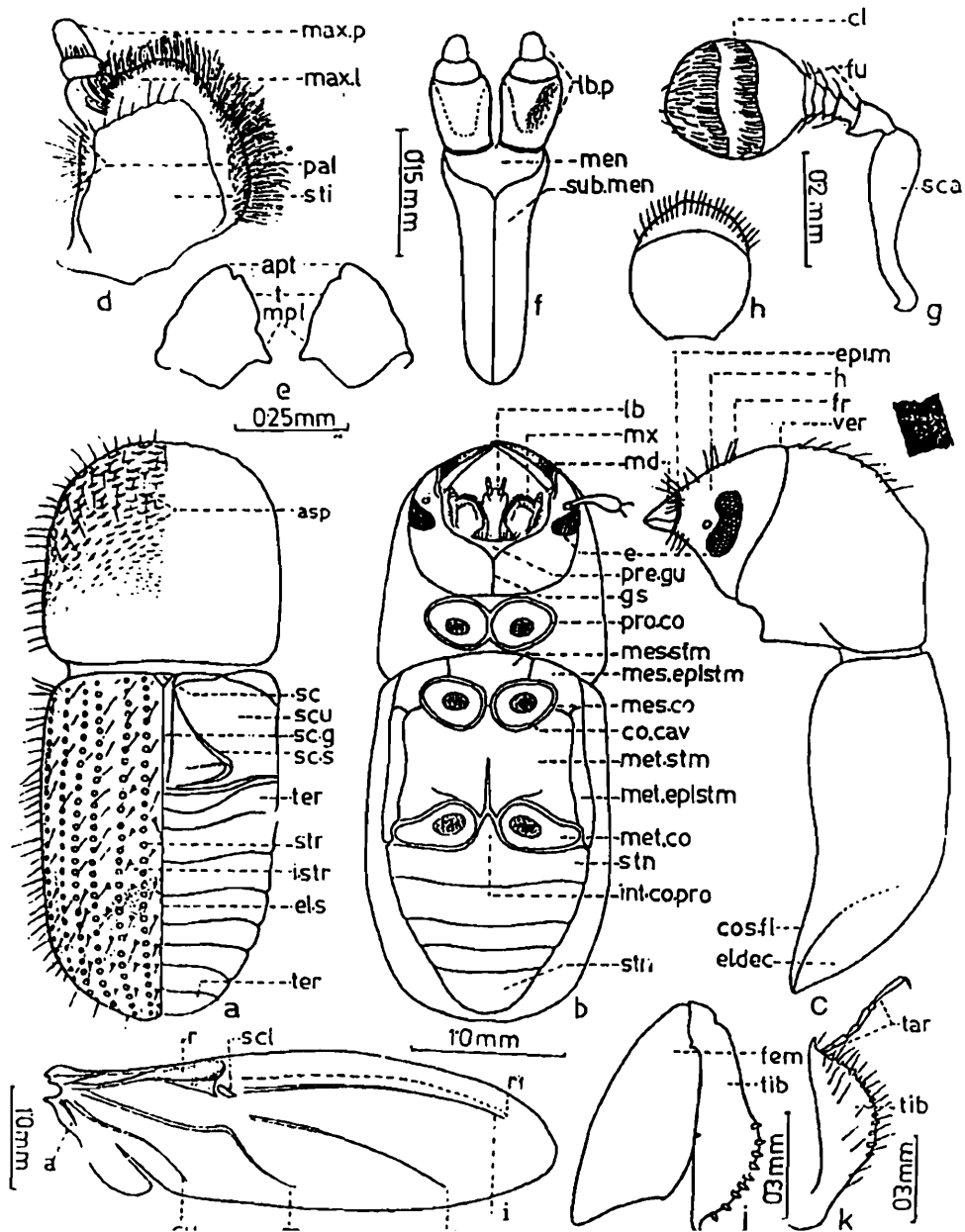
**Antennae** (Fig. 2) : The antennae are geniculate with well developed scape, funicle and club; and vary extensively in shape, size, number of segments, orientation of suture septum, etc. These characters are widely used in generic isolation. The scape may be either very short or as long as the funicle or longer, and also as long as the funicle and club combined together. Short scape is common in Hyorrhynchini, Hylesinini, Diamerini, Phloeosinini and Scolytini.

The funicular segments in different genera studied vary between three and seven. The first segment of the funicle generally known as pedicel, is always enlarged and rest of the funicles usually widening towards the club.

In the subfamily Hylesininae, except *Sueus* Murayama and *Hypoborus* Erichson with five antennal segments and *Hyorrhynchus* Blandford with six segments (Fig. 2b), all the genera have seven segments in antennal funicles.

In the subfamily Scolytinae, funicular segments vary between three and six, for examples, *Cosmoderes* Eichhoff with three (Fig. 2, i), *Cnestus* Sampson with four (Fig. 25, b), *Scolytoplatypus* Schaufuss with six (Fig. 2, f) and the rest of the genera with five segments. According to Wood (1978), in several groups, sometimes segmentation varies within a genus, even in the same individual and different number of segments on the two antennae is not uncommon.

The number of segments with characteristic short and long hairs, serve as one of the most reliable characters for generic differentiation. However, the long hairs in the funicle of males *Ficicis* Lea (Fig. 2, a) also serve as one of the important characters for sexual differentiation.



**Fig. 1.** *Euwallacea interjectus* (Blandford) : Female : a, pronotum and elytra in dorsal view : asp = asperities; el. s = elytral suture; i. str = interstriae; sc = scutellum; sc. g = scutellar groove; sc. s = scuto-scutellar suture; scu = scutum; str = striae; ter = tergites. b, head, pronotum and elytra in ventral view : co. cav = coxal cavity; e = eyes; gs = gular suture; int. co. pro = inter coxal process; lb = labium; md = mandible; mx = mamilla; met. epistm = metepisternum; mes. co = mesocoxa; met. co = metacoxa; mes. stm = mesosternum; met. stm = metasternum; pre. gu = pregula; pro. co = procoxa; stn = sternite. c, head, pronotum and elytra in lateral view : cos. fl = costal flange; e = eye; el. dec = elytral declivity; epi. m = epistomal margin; fr = frons; ver = vertex. d, maxilla in ventral view : max. l = maxillary lobe; max. p = maxillary palp; pal = palpifer; sti = stipe. e, mandible in ventral view; ap. t = apical palp; t = tooth; mpl = mandibular plate; f, labium in ventral view : lb. p = labial palp; men = mentum; sub. men = submentum. g, antennae in dorsal view : cl = club; fu = funicle; sca = scape. h, antenna in ventral view. i, wing : a = anal; cu = cubitus; M<sub>1</sub> and M<sub>2</sub> = median; r, r<sub>1</sub> and r<sub>2</sub> = radius; scl = sclerites. j, protibia and profemur : fem = femur and tib = tibia. k, mesotibia and tarsal segments : tar = tarsus and tib = tibia. (After, Saha and Maiti, 1996)

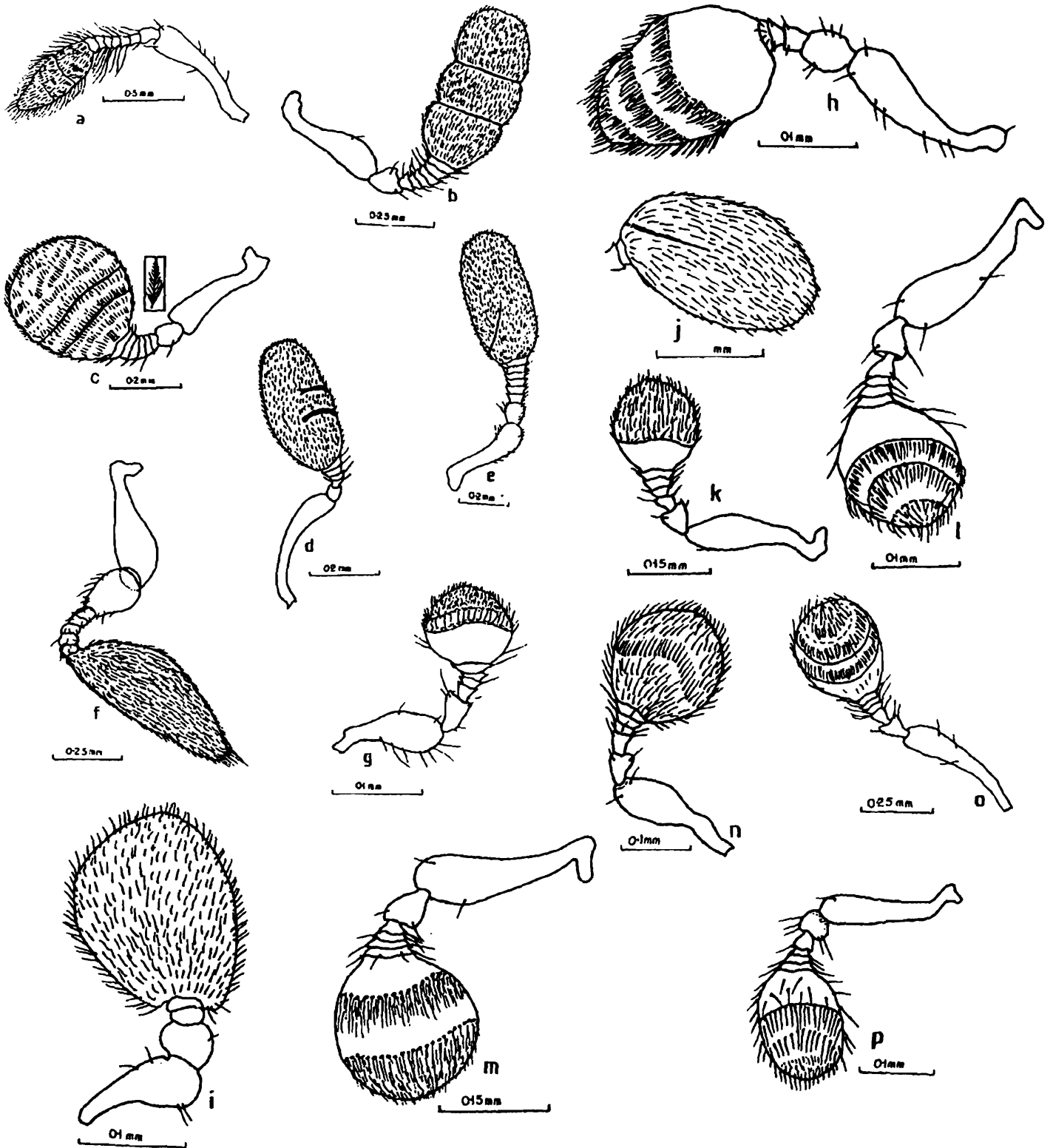
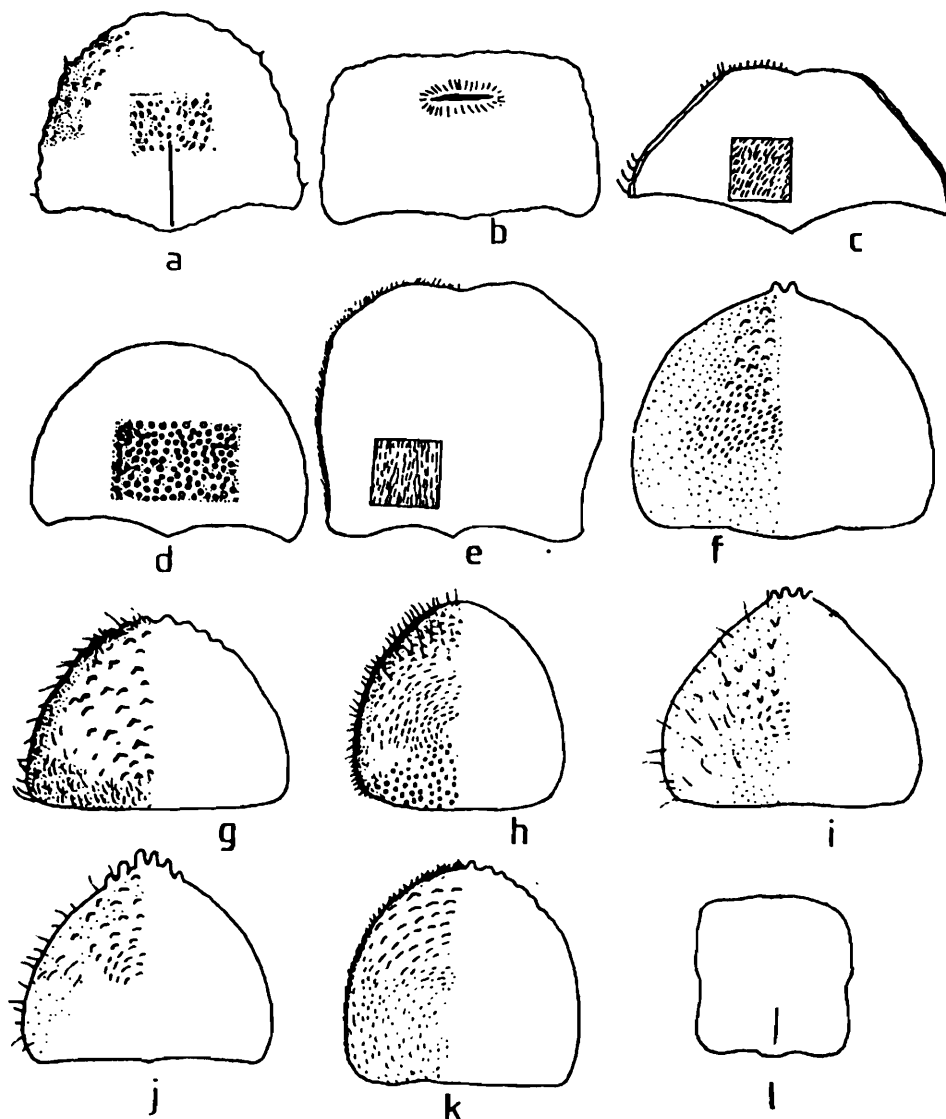


Fig. 2. Antennae of different genera of Scolytidae : *Ficicis despectus* (Walker) (Male); b, *Hyorrhynchus shiva* Maiti and Saha (M); c, *Sphaerotrypes siwalikensis* Stebbing (M); d, *Phloeocranus bruchoides* Schedl; e, *Diamerus curvifer* (Walker) (F); f, *Scolytoplatypus lopchuensis* Saha and Maiti (M); g, *Acanthotomicus perexiguus* (Blandford) (F); h, *Cryphalus strohmeyeri* Stebbing (F); i, *Cosmoderes monilicollis* Eichhoff (F); j, *Scolytogenus aspericollis* (Eichhoff) (F); k, *Coccotrypes longior* (Eggers) (F); l, *Xylosandrus beelsoni* Saha, Maiti and Chakraborti (F); m, *Cryptoxyleborus turbineus* (Sampson) (F); n, *Xyleborus major* (Stebbing) (F); o, *Hadrodemius metacomans* (Eggers) (F); p, *Xyleborus haberkorni* Eggers (F). (M = Male; F = Female)

The structure of antennal club which is generally formed by three segments, varies with endless varieties. It is assumed that the primitive club is conical from which other forms are derived (Wood, 1978). The shape varies from nearly spherical to elongate, dorsoventrally flattened to obliquely truncate (entire tribe Xyleborini except a few species) and flattened with sutures equal on both the sides of Corthylini, flattened and with sutures more strongly displaced on the posterior face of Cryphalini.

**Pronotum** (Fig. 3) : The characteristic features of pronotum have great evolutionary importance. In primitive groups, specially in the subfamily Hylesininae, anterior foramen is comparatively large and its axis is vartical. As a result, head is visible in dorsal view; the rest with smaller foramen and its axis is oblique, thus head is partly visible.



**Fig. 3.** Pronotum of Scolytidae and Platypodidae : Scolytidae : a, *Ficcis despectus* Walker (F); b, *Dactylipalpus transversus* Chapuis (F); c, *Sphaerotrypes siwalikensis* Stebbing (M); d, *Diamerus curvifer* (Walker) (F); e, *Scolytoplatypus lopchuensis* Saha and Maiti (M); f, *Scolytomimus philippinensis* (Eggers) (F); g, *Cryphalus strohmeyeri* Stebbing (F); h, *Coccotrypes nubilus* (Blandford) (F); i, *Hypothenemus glabripennis* (Hopkins) (F); j, *Ptilopodius ramosus* Beeson (F); k, *Scolytogenes aspericollis* (Eichhoff) (F); Platypodidae : l, *Platypus solidus* Walker (M). (M = Male; F = Female)

The shape of the pronotum varies from oval to elongate or cylindrical to subquadrate, sometimes broadest at base whence narrowing anteriorly. Dorsal surface varies from plano-convex to declivous on anterior portion. In plano-convex group (some Hylesininae), asperities are prominent antero-laterally and in declivous group (partly Scolytinae), those are mostly arranged on anterior declivous portion with varied density, shape and size. In some cases (as in the species of *Ambrosiodmus* Hopkins) asperities extend upto the base of pronotum (Fig. 18, a).

Anterior margin is sometimes either armed or unarmed with asperities of different sizes accommodated on projected or non-projected anterior margin. In the majority of males in the Xyleborinae, the anterior portion of pronotum is very much produced, as a result the head is concealed. Pronotum with rounded mycetangium on or near the anterior third, is the characteristic feature of the female beetles of *Scolytoplatypus* Schaufuss (partly). Lateral sides of pronotum in some genera are costate or rounded, sometimes emarginate accommodating profemora as observed in *Scolytoplatypus* Schaufuss.

**Scutellum** : The characters of scutellum are also widely used in classifying the genera. In Hylesininae, it is small, oval and depressed with more or less roughened surface, but not visible in the genus *Diamerus* Erichson. Likewise, in some scolytine genera, such as *Coptodryas* Hopkins and *Scolytoplatypus* Schaufuss, the scutellum is submerged and not visible dorsally. Still in other genera, namely, *Cryptoxyleborus* Schedl, *Eccoapterus* Moschulsky and *Hadrodemius* Wood, the scutellum is not reaching the level of elytral surface, but visible only on the declivous portion of elytral base. In the large majority of cases, the scutellum is visible with varied forms from tuberculate to triangular or round in shape.

**Elytra** : Elytra contain many important taxonomic characters for specific and generic differentiation. However, only a few characters like the basal margins, tenth interstria and elytral coupling mechanism have bearing in the phylogenetic study as mentioned by Wood (1978).

The basal margin of each elytron is outcurved and armed with a series of crenulations being the characteristics of all Hylesininae, except in the genus *Diamerus* Erichson with elevated costa only. In Scolytinae, the elytral base usually forms a straight transverse line across the body, except in the genus *Coptodryas* Hopkins with a feebly outcurved basal margin and devoid of any scutellar emargination. In both the subfamilies scutellar emargination results in accommodating the scutellum.

The shape of the elytra varies from short and stout to long and cylindrical ones with lateral sides either subparallel or outcurved and terminating into broadly to narrowly rounded apex. Sometime the terminal one is provided with spines or tubercles as is the genus *Cryptoxyleborus* Schedl, even in some cases each elytral apex individually rounded, which is more a specific character than a generalized character of the genus. In primitive forms, the weak elytral declivity is very common, but in most Scolytinae, it is a very specialized character with different modifications.

In advanced genera, elytral apices are truncated, but either with complete circumdeclivital costa or with incomplete circumdeclivital costa (*Xylosandrus* Reitter, partly). Excavated elytral apex with tuberculation on or near the excavated margin is an interesting feature found in *Acanthotomicus* Blandford and in some species of *Xyleborus* Eichhoff. Generally, the declivital face is convex or concave or flat. Posterolateral margins of elytra are either carinate or non-carinate, but both the features may be with or without granules or tubercles.

**Legs (Fig. 4) :** Tibial and tarsal characters are extensively used in classification of different tribes, particularly the shape, size and position of the tibial spines. The primitive types of tibial spines are formed in *Hyorrhynchus* Blandford (Fig. 4, b) where the apical single spine is considered as a primitive character. There are two major types of tibial teeth, first one is the apical and lateral unsocketed spine, and the second type is socketed tooth-like denticles which are presumed to have setal origin (Wood, 1978).

**Classification of Mycetangia :** The transmission of fungal spores by the Scolytid beetles to their hosts is mostly done in a special integumental sac known as 'mycetangia'. This process is not at all a mechanical one. Sometimes, the spores need to mature within the body of the beetles. Some beetles discharge their nutrient secretions where the spores are protected and preserved (Franke-Grosmann, 1963). The relative position of the 'mycetangia' in body of the female beetles carries some taxonomic significance which may be classified as follows :

1. *Oral Mycetangia* : Sac-like pocket placed at the base of the mandibles below the epipharynx which open into the preoral cavity. Such organs have been reported in some species of *Euwallacea* Hopkins, namely, *Euwallacea andamanensis* (Blandford), *E. fornicatus* (Eichhoff) and *E. velatus* (Sampson).

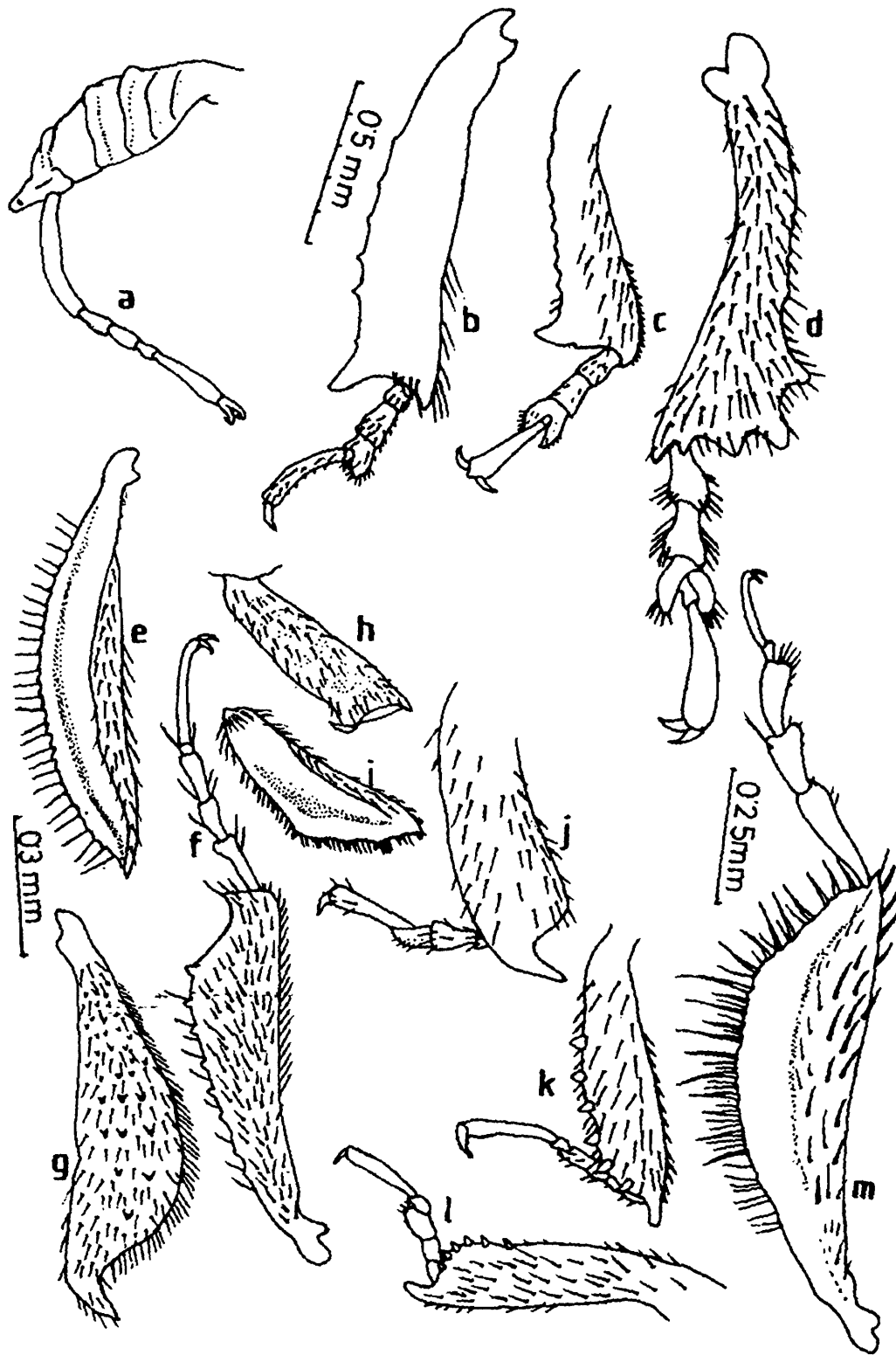
2. *Pronotal Mycetangia* : There are sac-like invagination on the surface of pronotum, generally, found in some species of *Dactylipalpus* Chapuis. (Fig. 3, b) and *Scolytoplastypus* Blandford, and in some Platypodidae.

3. *Prothoracic-Pleural Mycetangia* : Sac-like invagination on different location of pleural region of the female. Such types are reported in some exotic genera, such as, *Trypodendron* Stephens, *Xyloterinus* Swaine, *Dendroctonus* Erichson and others.

4. *Prosternal-Subcoxal Mycetangia* : The enlarged coxal cavity of some species of predominantly new World genera, namely, *Gnathctrichus* Eichhoff, *Monarthrum* Kirsch, etc. serve as a sac where the fungal spores proliferate.

5. *Pro-Mesonotal Mycetangia* : A pair of invagination in the intersegmental membrane beneath the posterior area of the pronotum is found in *Xylosandrus germanus* (Blandford).

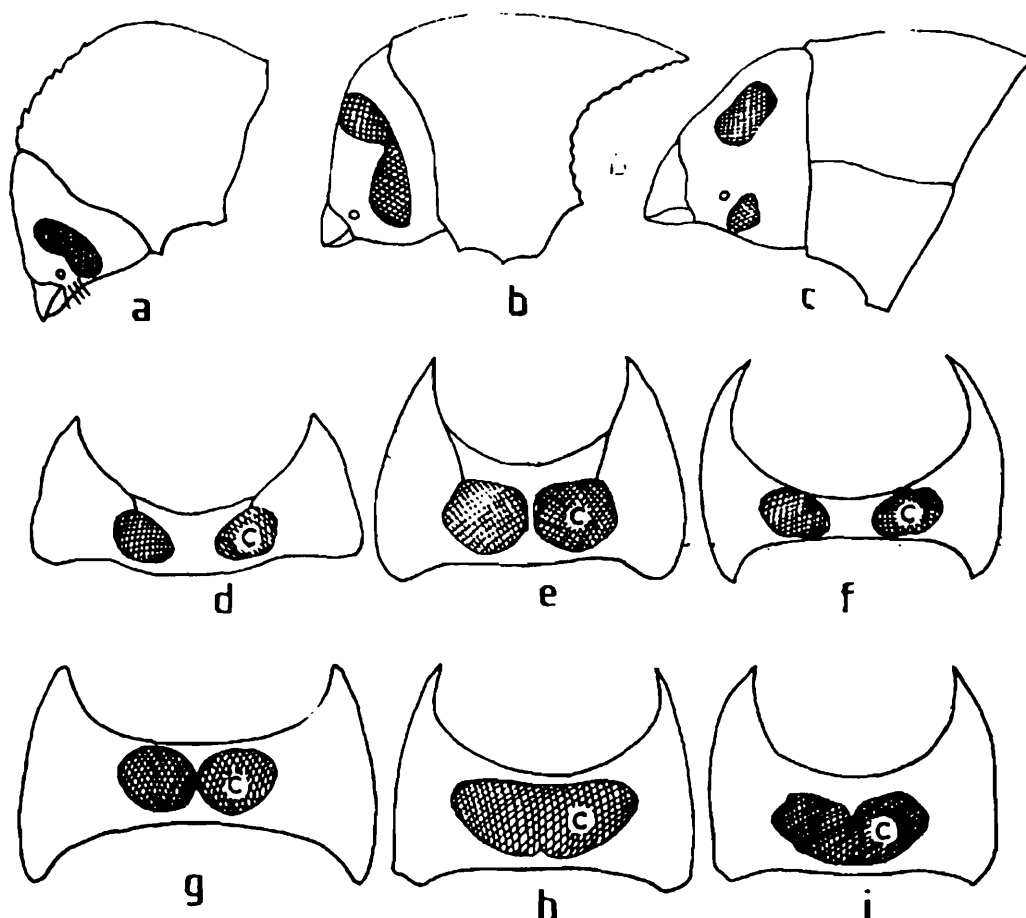
6. *Elytral Mycetangia* : A cavity encircled by a cluster of setae placed on the anterior margin near the scutellum is reported in almost all the species *Xyleborinus* Reitter.



**Fig. 4.** Tibiae and tarsi of Platypodidae and Scolytidae : Platypodidae; a, *Platypus solidus* Walker (M, tibia and tarsi); Scolytidae b, *Hyorrhynchus shiva* Maiti and Saha (M, protibia and tarsi); c, *Sphaerotrypes siwalikensis* Stebbing (M, protibia and tarsi); d, *Ficicis despectus* Walker (F, protibia and tarsi); e-g, *Scolytoplatypus lopchuensis* Saha and Maiti (M, e, mesotibia showing cavity, f, protibia and tarsi and F, g, protibia); h-i, *Diamerus curvifer* (Walker) (F, h, protibia and i, mesotibia showing cavity); j, *Scolytus major* Stebbing (M, protibia and tarsi); k, *Scolytogenes aspericollis* (Eichhoff) (F, protibia and tarsi); l, *Hypothenemus areccae* (Horbung) (F, protibia and tarsi); m, *Eccoptopterus spinosus* (Olivier) (F, metatibia showing cavity).

## BIOLOGY

**Food and Feeding Habits :** The members of the beetles belonging to the family Scolytidae include subcortical-feeding (bark beetles) and Wood-boring insects (ambrosia beetles). The females usually burrow into the host plants for depositing their eggs directly in the food source to be consumed by their larvae during their development period. The concealed tunnels excavated in the wood by these insects serve as protective device against the environmental hazards in general and entry of predators and parasites in particular. However, some beetles are monophagous and others are polyphagous showing strong preference for younger or older trees especially attacking thin or thick-barked portions of the trunk or root, branches or cones. Scolytids are referred to as secondary pests, since they prefer dead, dying or moribond trees as their breeding material, but they can be treated as primary pests during their population out break. According to their food and feeding habits, these beetles may be divided into several categories (Schedl, 1958; Browne, 1961).



**Fig. 5.** a-c, Head and pronotum in lateral view showing eye : a, *Xyleborus similis* Ferrari (F); b, *Phloeocranus bruchoides* Schedl (F); c, *Sphaerotrypes siwalikensis* Stebbing (M); d-i, Prosternum showing coxal cavity : d, *Ficicis despectus* (Walker) (F); e, *Xylosandrus gravidus* (Blandford) (F); f, *Xylosandrus beelsoni* Saha, Maiti and Chakraborti (F); g, *Xyleborus bidentatus* (Motschulsky) (F); h, *Pityogenes scitus* Blandford; i, *Acanthotomicus perexiguus* (Blandford).

1. HERBIPHAGY includes those beetles feeding on the non-woody plants, such as, petioles, herbaceous stems, fruiting stalks of grass, etc. The members of the genus *Hypothenemus* Westwood belong to this group. Since these beetles feed on the different parts of the herbs, they at times become serious pests to agriculture corps.

2. SPERMOPHAGY is associated with the beetles feeding on seeds and at least parts of the protective fruit that covers them. The genera *Coccotrypes* and *Hypothenemus* comprise the pests of fruits and seeds of trees. Spermophagy is much more common among the tropical genera.

3. MYELOPHAGY is generally called to the feeders of the juvenile pith of green twigs. The members come under this category belonging to the genus *Hypothenemus* Westwood.

4. PHLOEOPHAGY is the habit of feeding on phloem tissues of the inner bark of host-plants. The large majority of groups of this family are included in this categories, particularly, the members of Hylesininae, Scolytini, Dryocoetini, etc. This habit is generally exhibited by their characteristic engraving nature on the surface of peeled bark or wood (Fig. 6).

5. XYLOPHAGY inhabits xylem or wood tissues, although all ambrosia beetles are not included in this category, since their principal food is not always xylem.

6. XYLOMYCETOPHAGY includes those beetles which are involved in cultivation and utilization of symbiotic fungus as their food source. The members of the most common Indian genus *Xyleborus* Eichhoff belong to this category.

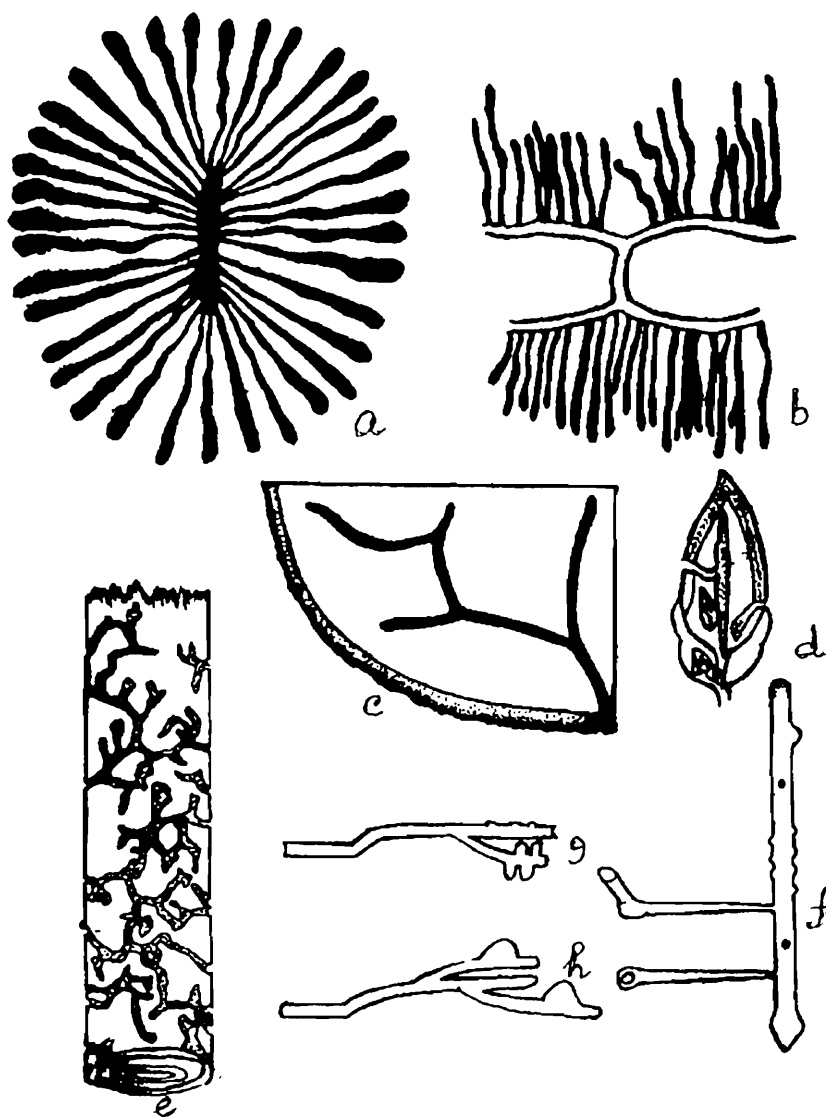
**Social Organization** : Social Organization is quite well developed among the members of the family Scolytidae. Each small family inhabits a broad separate nest in which the young received parental care and there is strict division of labour between the parents. In Xylomycetophagous and Spermatophagous species, in particular, such care is taken throughout the metamorphosis period.

Social organization is of three distinct types, such as, monogamy, moderately polygamy and extremely polygamy. A monogamous type, where a male mates with a single female, is very common amongst the members of Scolytinae, Scolytoplatypinae, majority of Hylesininae and in some Ipini.

A social organization of moderate polygamy, in which each male takes several females (2-5), all of which live in one nest, is quite rare, but is prevalent among some Ipini, an important tribe in the temperate region. The male inhabits a central chamber close to the entrance of the nest in which each of the females make contact and spend the mating period.

In the extreme polygammy type of organization, the ratio of females to males is high and males are short-lived and stay in parent nest. The females are fertilized before they start in search of a new nest and take the responsibility of construction and caring the brood. Such organization occurs throughout the ambrosia groups of the family.

**Gallery System** (Fig. 6) : All members of the family complete their life cycle within galleries in or under the bark or in wood or cones, except for a short flight period. Dispersal of population and to locate suitable breeding material, are performed by flight. However, during the cryptic or conceal life in the wood for food and shelter, these beetles excavate tunnels, chambers, etc., which are unique and represent the non-morphological characters for their identity in the fields.



**Fig. 6.** Gallery patterns in different species : a, b, gallery pattern of phloeophagous species; c, gallery pattern of xylo-mycetophagous species; d, gallery pattern of spermatophagous species; e, gallery pattern of herbiphagous species; f, nest of a phloeophagous species; g, h, nest of xylo-mycetophagous species.

Gallery system of a typical phloeophagous species consists of the following parts (Wood, 1982).

1. *Entrance Tunnel* : The entrance hole is a short and simple cylindrical tunnel normally directed obliquely upwards through barks to facilitate for removal of wood

dust and to protect against the rain. The diameter of the tunnel generally slightly wider than the diameter of the beetles, so as to enable the beetles to plug the hole against predators, parasites and other intruders.

2. *Nuptial Chamber* : It is a flattened chamber (tubular) normally excavated at the terminal end of the entrance hole. The lowest margin of this chamber is connected by the entrance hole to facilitate the easy expulsion of grass granules. In polygamous species where the males participate in formation of gallery system, such chamber is well developed. It is partly or entirely absent where males are not associated with the gallery (Wood, 1982).

3. *Egg Galleries* : One or more egg galleries are formed by the females along the cambium layer running away from the nuptial chamber. The characteristic pattern of egg-galleries are the indirect clue of field biological features for the identity of the taxa in absence of the beetles. In primitive forms, the egg galleries are more irregular pockets along the margins of nuptial chambers.

4. *Larval Mines* : The larvae after hatching may feed exclusively on mycelial or other material supplied to them or feed on weed in the parental chambers consequently resulting into its enlargement. Larval mines are slightly longer than body of larvae excavating the mine and packed with a granules in contrast to other chambers. The mines may be expanded to both bark and wood or to either of these two only. Pupal chamber is generally formed near the end of the larval mine. After matamorphosis, some species immediately emerge through the exit hole, while others require a maturation feeding period before they emerge.

The general gallery pattern of Scolytid beetles may be classified as follows :

i) *Cave-Tunnels* : The larvae of these beetles generally excavate a simple cavity either in the cambium or in wood or in pith.

ii) *Uniramous Gallery* : The most simple gallery is made in the longitudinal or transverse direction in the xylem or phloem tissues of wood. Generally a conspicuous nuptial chamber is formed near the entrance hole.

**Development** : The members of Scolytidae undergo a normal complete metamorphosis, through different stages, like egg, larva, pupa and adult. The eggs are ovoid, white and translucent in appearance. The females of most species produce eggs for a considerable period of time, upto several weeks in the humid tropics, as such, all or almost all stages of the metamorphosis may frequently be found together in the same nest. On hatching of the eggs, the larvae, a leg less eruciform grub, start feeding except during ecdysis. Just before pupation, the body of the curved larvae become straight or almost so. At first, the pupae are of about the same size as the mature larvae and then become gradually shortened.

The period of life cycle depends on genera climatic conditions and more particularly, of course, on the microclimate of the nest. The full life cycle of most species varies from about 4 to 6 weeks.

## ECOLOGY

The scolytid-beetles generally lead a cryptobiotic mode of life. They habitually complete their life cycle within the conceal habitats of galleries and nests under bark or in wood or cones, except a short period of flight. As such, the differential drying and decaying conditions of wood serve as the major factors in the breeding biology and ecology of these beetles. On the basis of breeding conditions of material required by different beetles, some ecological groupings may be recognised (Wood, 1982) as follows : (i) Primary (Tropical Ambrosia beetles) and (ii) Saprophagous (Sour Cambium beetles) group.

**Ecological Role in the Forest :** It is well known fact that the rapid removal of broken and diseased, fallen trees in the forest floor, accelerates the growth of primival forest. The scolytid-beetles are the first biological agents to attack the dead wood material for further decay and deterioration, and provide avenue to other wood degrading agents to accelerate the process. Therefore, these beetles have greater ecological role to play and to occupy an important niche in the forest ecosystem.

**Host-Susceptibility to Attack :** All the trees in a forest stand are not equally susceptible to beetles attack. This largely depends upon the vigour, age, physiology of the individual tree including the characteristics of the site and soil where it grows. In course of time, such minor differences in susceptibility may alter the character of the forest and even eliminate certain tree species from the boarder area. If the number of susceptible trees increase in a given area, the bark beetles population increase. When such trees are less in number, beetle population will certainly decrease. It is generally accepted that trees growing on poor environmental condition are more susceptible to beetle attack than those growing on suitable site. There are more experimental results regarding host-specificity of the beetles in different trees.

**Competition for food :** Due to smaller size and limited ability of scolytid-beetles, they avoid competition for food, rather they steal food or rear their broods before the hatch of eggs of competitors hatch. The large larvae of round-head borers (Cerambycidae) and flat-head borers (Buprestidae) remove 75 to 95 per cent of food material (phloem) and remain responsible for the destruction of these beetles. In such case, escape is the best method to avoid competition.

In most phloeophagous scolytid-species, the larval mines are independent of one another and generally never cross each other. But when crossing is extreme, these larval tunnels merge, thereby competition results into killing of others. In such cases, less number of population survive and attain maturity.

**Host-Selection and Dispersal :** The beetles stage their dispersal flight to locate the new hosts by the odours of volatile Oleoresins, terpene hydrocarbons, alcohols or other substances given off by the recently felled logs or dying host tissues. When such attractive odour is not properly identified, random flight takes place. The reproductive readiness following maturation of the gonads of these insects also serve as one of the

factors for rapid of new host-material. After finding the suitable host either by the male or female, the beetles release sex attractant or pheromone in the tunnel to attract other individuals of the same species to overcome any resistance to the attack by the host-trees for successful infestation.

**Relationship with Fungi and Diseases :** The nature of symbiotic relationship between ambrosia beetles and fungi is not fully understood as yet. Graham (1952) is of opinion that each beetle species has specific fungus which grows in different tree species, thereby the beetle species become host-specific.

However, the relationship varies from most casual to perhaps accidental and certainly mutualistic bond where one fails to survive without help of others. Ambrosia beetles culture fungi in their nests to use the spores as their food. Some other groups require the help of fungi to increase the food value to xylem of host tissues. The blue stain fungi are carried by the integumental sacs, termed as "mycetangia" by the females which are of different types according to their position in the body of the beetles (vide, classification of Mycetangia).

According to Franke-Grosmann (1956) there are differences in form, colour, rate of development and size of mycellia among the fungi of the same beetle species.

**Factors Influencing Larval Development :** The cambium or wood of the host generally serve as the food and shelter of most bark-beetles during the larval and adult life except for a short period of dispersal flight. Due to their mechanical isolation from the prevailing environment, their immediate micro-climate in the wood, i.e. food, space, temperature, moisture, etc. become the most decisive factors in the life process of these beetles and determine their population dynamics and ecological balance.

**Food and Space :** Monophagy i.e., the dependence for food upon one species or genus of plants is not uncommon amongst scolytid beetles. Likewise, there are numerous species which show preference to several hosts, i.e., polyphagy.

## ECONOMIC IMPORTANCE

The bark and ambrosia beetles play both beneficial and harmful roles in human economy. It is well known that these beetles help maintaining the vigorous growth of plants as well as in recycling of dead plant tissues. In temperate climate, some species of *Carphoborus* Eichhoff, *Pityophthorus* Eichhoff, etc. enhance the natural pruning process. Such process is beneficial for vigorous tree growth as well as reduce the fire hazards (Wood, 1982). Likewise, some members of *Pityophthorus* Eichhoff, *Xylechinus* Chapuis, *Ips* DeGeer help recycling the wind-thrown broken branches, diseased logs, injured trees on the forest floor increasing the fertility of soil for vigorous plant growth. Sometimes, these species become noxious when they attack the useful commercial logs.

The harmful role played by these insects are quite pronounced when they hamper the growth of forest plants and deteriorate the value of timber in use. In temperate forest, they cause injury to living twigs, cones of *Pinus*. In the temperate regions, the bark-and timber-beetles are of immense importance to forestry. Particularly in pure coniferous forests, epidemic of bark beetles creates a perennial problem for forest management. Thus hamper the growth of forest plants and deteriorate the value of timber in use. There is stunning effect on growth of forest trees which may weaken the tree vigour to make them susceptible to attack by tree killing species or attract plant diseases. Million feet of timber are regularly destroyed and thousand hectares of forest are being devastated by bark beetle invasion in North America.

In the tropical deciduous forest as largely found in India, the prevailing conditions are quite different. In the Indian coniferous forest, the menace of epidemic rarely appears. The tropical and subtropical species of bark-borers, meet with powerful competition from other bark borers like cerambycids and buprestids which prevent population growth in natural forest. In India, the members of *Xyleborus* Eichhoff generally attack living seedling, living shoots and twigs of older trees. Excessive multiplication of population takes place in the felling-debris, timber killed by natural calamities, but as soon as these material disappear, the population start declining in the area. Another group of species of *Xyleborus* Eichhoff, *Scolytoplatypus* Schaufuss and *Webbia* Hopkins breeds in the felled logs, dying timber and branch wood. Timber is spoiled and ruined by pin holes, shot holes and other defects are caused by the ambrosia beetles.

However, the economic loss caused by these beetles can hardly be estimated. In North America, at least some estimations are made based on the length of timbers spoiled of different trees by various beetle species.

Estimation of economic loss caused by these beetles in the tropics is difficult due to less spectacular damage. Whatever damage they cause in freshly felled logs, timbers in storage, in seeds and cones, reduction of plant growth or transmission of diseases is in intensive rate against extensive rate as observed in the temperate forest. Mass killing of healthy trees in the tropics is uncommon. The damage is much more subtle which is difficult to assess.

## CONTROL

It is an established fact that the scolytid-beetles are of considerable economic importance throughout the World especially in the temperate forests. It is the dream of the Scientists to keep the population of these beetles below the threshold level of their damage, particularly during the population out break of some destructive species. Some control measures (Wood, 1982) are discussed briefly as follows :

**Direct Control** : The artificial means reduction of any population refer to direct control which can be devised in several ways. The method selected depends upon

(i) the habit of the beetle, (ii) the thickness of bark, (iii) the size of the infested trees, (iv) the height of the infestation, (e) forest types, (f) the accessibility to road, and (g) public pressure. The methods summarized below are based on Rudinsky (1960, 1962 and 1978).

1. *Salvage* : The infested trees are removed from the forest before brood matures to a distance beyond the flight range of the beetles. On the other hand, it is safe to destroy the infested portion or the trees. Salvage operation sometimes becomes very expensive also.

2. *Fell, peel and burn* : Where the chemical control is not feasible, this oldest method of pulling off the bark along the trunk is used frequently. This method is practised where the brood is not exposed on pulled bark.

3. *Fell, deck, burn* : This method is followed in cases where the infested trees are small. These are felled and loged at direction of right angles and then fired in safe place where the healthy trees are not scorched, causing susceptibles to further beetles attack.

4. *Oil burning* : In this method, the infested thin bark on the pole of standing trees is sprayed with slow-burning fuel oil and fired. Precaution must be taken to prevent fire hazards causing damage to the other trees.

5. *Peeling* : This method is only effective when the brood is exposed on bark. Such bark of either standing or felled logs are to expose the brood to desiccation or predation by predatory animals.

6. *Solar-heat* : The infested trees are felled, the branches are removed and the logs are exposed to maximum radiation of sun. The lethal temperature for bark, beetles ranges from 24-26°C. The logs are to be turned to sun regularly during the operation. In India, most scolytids of thick barked trees, having short life cycle, may be destroyed by this process (Beeson, 1941).

7. *Trap trees* : The beetles are attracted to freshly felled or girdled standing trees where extensive destruction is carried out. This method has limited success when used for different beetles.

8. *Drowning* : If the logs are submerged in mill pond for more than six months or so, then these logs remain free of infestation. The exposed surface may be turned down to be submerged. Sometimes, the chemicals are used to prevent further attack on the exposed surface.

9. *Chemical control* : The chemical used for the purpose are orthodichlorobenzene, benzene hexachloride, ethylene dibromide, etc. These may be used in various concentration in different surface of the trees or logs. Although, the chemical is most effective and less costly, but proved to have adverse effect on the wildlife and cause harm through biological magnification in the forest ecosystem.

10. *Pheromone Trap* : Sex attractant pheromone traps are widely used to control different insect with remarkable success. But numerous experiments with pheromones (with or without tree resins, alcohol or combination of both) to control bark beetles, have proved to be less fruitful.

**Indirect Control** : Each and every organisms have an intrinsic and inherent capacity (biotic potential) to increase its population at a faster rate which is always been counteracted by the natural factors (both biotic and abiotic) to maintain the population at a more or less constant but fluctuating level. In natural condition, the bark and ambrosia beetle population fluctuate from season to season and year to year. Such oscillation of population is directly correlated with the rate of economic loss caused by these beetles in time gradients.

The major abiotic factors, namely, temperature, rainfall, humidity, health and vigour of host population, natural calamities, etc. have some controlling effect on these insects. Further, the biotic factors, such as insect parasites, parasitoides and predators, predaceous mites, insectivorous vertebrates, nematode parasites and disease, have more significant role in controlling these insects.

An unifying concept of Forest Management is to encourage the indigenous enemies in order to keep the population of these beetles below the threshold level of their damage. In some instances, enormous success has been achieved in destroying 90 per cent of the brood of bark-beetles in a generation.

*Insect Parasites* : Large majority of Insect Parasites of these beetles belongs to order Hymenoptera. To name few important families amongst many others, are Brachonidae, Bathylidae, Chalcididae, Encyrtidae, Eupelimididae, Ichneumonidae, Proctotrupidae, Torymidae, etc.

*Insect Predators* : The coleopterous families, Cleridae, Colididae, Cucujidae, Elateridae, Histeridae, Nitidulidae, Rhizophagidae, Staphylinidae, etc. are involved in predating upon these beetles both in their larval and adult stages. Many other predaceous insects including Ants may prey on the bark beetles on their flight and reduce their population significantly.

*Mite Predators* : Some mites are known to predate upon these beetles. No detailed data is available.

*Insectivorous Vertebrates* : Among the vertebrates, amphibians, reptiles, birds and mammals are voracious feeders of bark beetles. However, during flight period of some of these beetles, various bird species have been observed to snatch these beetles on flight during dust around freshly felled logs in Assam forest. Likewise, lizzards and rodents are very much fond of these beetles as their food.

## ZOOGEOGRAPHY

*General* : The present day distribution of species largely depends upon the combination of various factors (both past and present), such as, physiography, climate, geology, soil, vegetation, human intervention, etc. including the intrinsic characteristics of that species. Since animals are largely heterotrophic in nature (consumer), they depend generally on plant producers for their survival and propagation. The environmental factors mainly determine the distribution pattern of the plant communities (structural species) in a given area which indirectly dictates the distribution and orientation of animal communities (interstitial species) especially in certain groups as in the bark and ambrosia beetles being strictly phytophagous in nature (vide, biol.).

However, any discussion on distribution and zoogeography of these beetles in India will not at all be satisfactory unless certain major factors are not briefly taken into account. The coleopterous family Scolytidae, which includes about 6000 named species from the world, is represented in India by 275 species under 58 genera and two subfamilies i.e. Hylesinae and Scolytinae (Saha and Maiti, 1992). As such the fauna is not at all as vast as the country itself with its contrasting land elevation and soil, and is crisscrossed by the extensive river systems. The country with its area of 3,276,373 sq. kms. lies between 6°S-37°6' N and 68°7' E with a population of about 100 crores, supports loftiest mountain ranges (the Himalaya), low hills, laterite uplands and plateau, varied types of forest (Fig. 8 ) scrub Jungles, arid tracts, rich alluvial plains, etc. All these features affect scolytid distribution.

Geologically, the country represents a monumental assemblage of land pieces, varying in age from Pre-cambrian to the Recent. This massif, a part of the super continent 'Gondwanaland' is still in separation and drifting sometimes in the mid-Mesozoic era (about 200 m.y.a.). The peninsular massif is the core around and upon which different geological formation has taken place.

The soil varies from yellow, coarse sand in the Thar Desert to clay loam and slit are gravelly in nature. Some physical factors which constitute climate, such as temperature, humidity, rainfall, soil, sunshine, air pressure and current, etc. are of immense importance in determining the distribution and abundance of these beetles along with their parasites, predators and associates (Wood, 1982). Except the short dispersal flight, these insects stay within the host in a more stable micro-environment which effects on the intra-population variability. Apparently, it seems that the prevailing climate around has least effect on these beetles, but certain long-range effects are pronounced. The impoverished fauna in a Desert, dispersal of temperate genera through cool corridors of the mountain range to the tropical areas, population fluctuation or attending lethal condition under the influence of high or low temperature, are some of such examples to indicate the long range effect of prevailing climate on these beetles.

**Physiographic Regions** (Fig. 7a) : Based on all physical factors including stratigraphic and tectonic history, relief, erosion, the country may be broadly distinguished into four macro regions as follows : (i) The Himalayan Mountain Ranges; (ii) The Great Plains; (iii) The Peninsular Upland; (iv) The Indian Coasts and Islands. The individual characteristic features of these Division determine the types of forest community in each areas which indirectly regulates broadly the distribution and species richness patterns of the scolytid beetles as in other animals in the country.

**Climate** : The climate of the Indian subregion varies considerable changing from temperate (in the Himalayan areas) to subtropical to tropical towards the southern plains (Fig. 7) boundary. The massive Himalaya situated on the northern side mainly presides over the climate of the country. The climate changes widely and may be distinguished into three main seasons : (i) *Summer season* - Hot and dry season from March to June, prevails in the northern plain experiencing high temperature upto 45°C. The same area receives warm wind blown from the Thar Desert, called the 'Loo' (ii) *Rainy season* - extends from July to September under the influence of monsoon with heavy rain in the eastern India (worland's highest rainfall in Cherrapunji 3000 mm), western ghats and least in the Deccan being the rain shadow area. The monsoon wind loses its water vapour while travelling along the Gangetic plain towards north causing ultimately little rain in the Thar Desert. (iii) *Winter season* - from October to February experiences cold wave at places often near or below the freezing point blowing from the snow-clad Himalayan mountain towards the southern plains except the Peninsular area. However, this area receives moderate rainfall under the influence of retreat monsoon during the period.

**Vegetation and Forest Types** (Fig. 8) : The distribution and abundance of Scolytid-beetles in India being phytophagous insects seem to be closely related to the floral distribution. The country supports as many as 45,000 species of plants, which vary from thorny bushes (Rajasthan) to alpine (High altitude), to evergreen forest (Western ghats and Assam) and to deciduous scrub and mangrove occurring in the coastal plains. These plant communities have strong affinities with Burmese and Chinese species along with its closeness to those of Australia, Malaysia, East Africa. Such affinity is also pronounced among the scolytid beetles of India. Forests are natural vegetation in the country, covering 5,54,480 sq. km., although it falls far behind the International one-third optimal acreage. However, on the basis of Champion's Scheme, modified by Puri (Champion and Seth, 1968), there are 5 major groups of forest subdivided into 16 subgroups as shown in the Map (Fig. 8).

**Distribution** : As already mentioned, present day named species of Scolytid species from India stand to a total of only 27<sup>0</sup> species under 59 genera belonging two subfamilies (Saha and Maiti, 1996). Whatever may be magnitude of the fauna in India, the detailed distribution pattern and zoogeographical analysis as a whole have never been done earlier by any author, except the regional fauna of the islands of Andaman and Nicobar (Maiti and Saha, 1996) and the sub-Himalayan West Bengal (Saha, 1985; and Saha and Maiti, 1992).

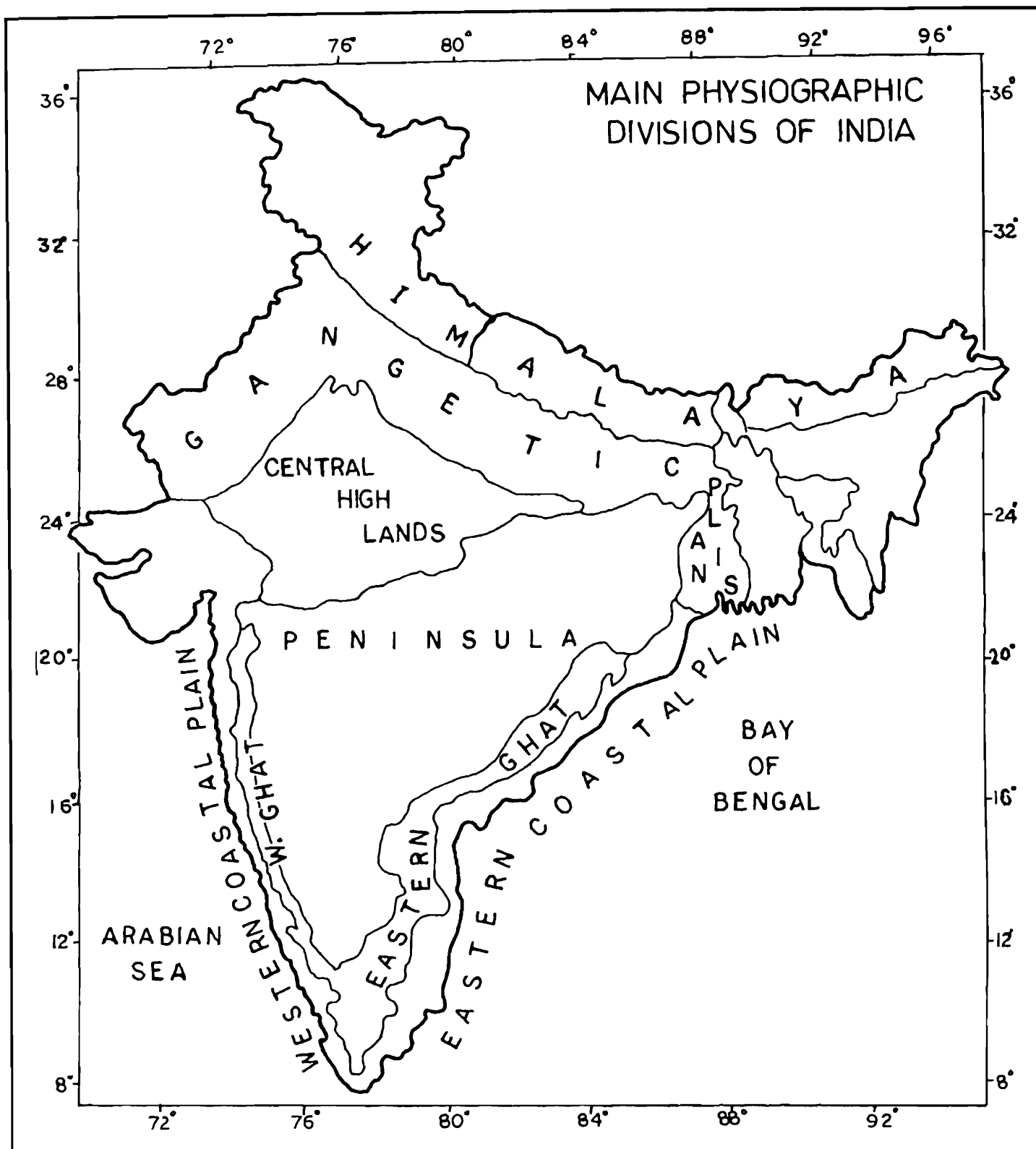


Fig. 7a. Map showing Main Physiographic Divisions of India

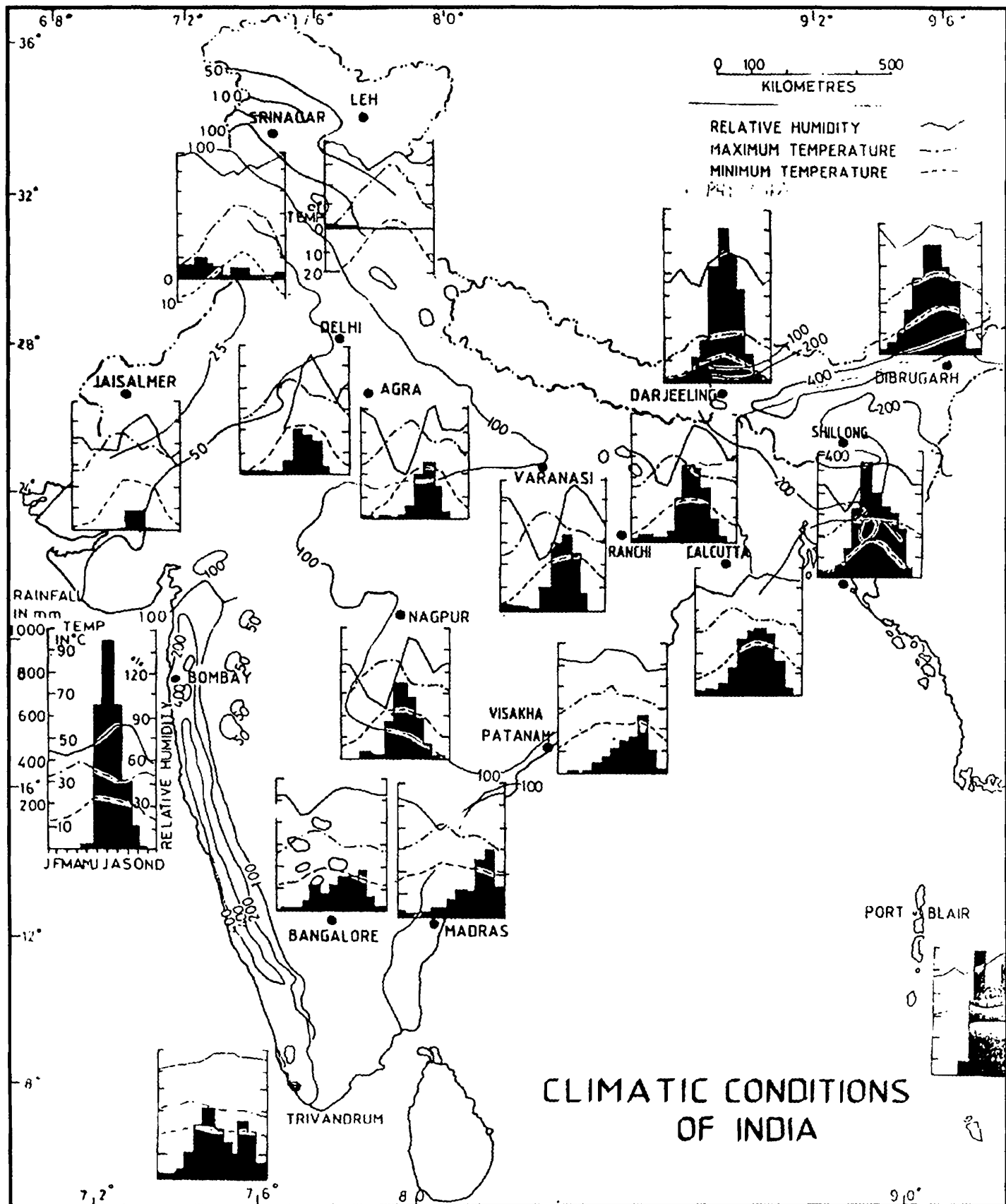


Fig. 7b. Map showing Climatic Conditions of India.

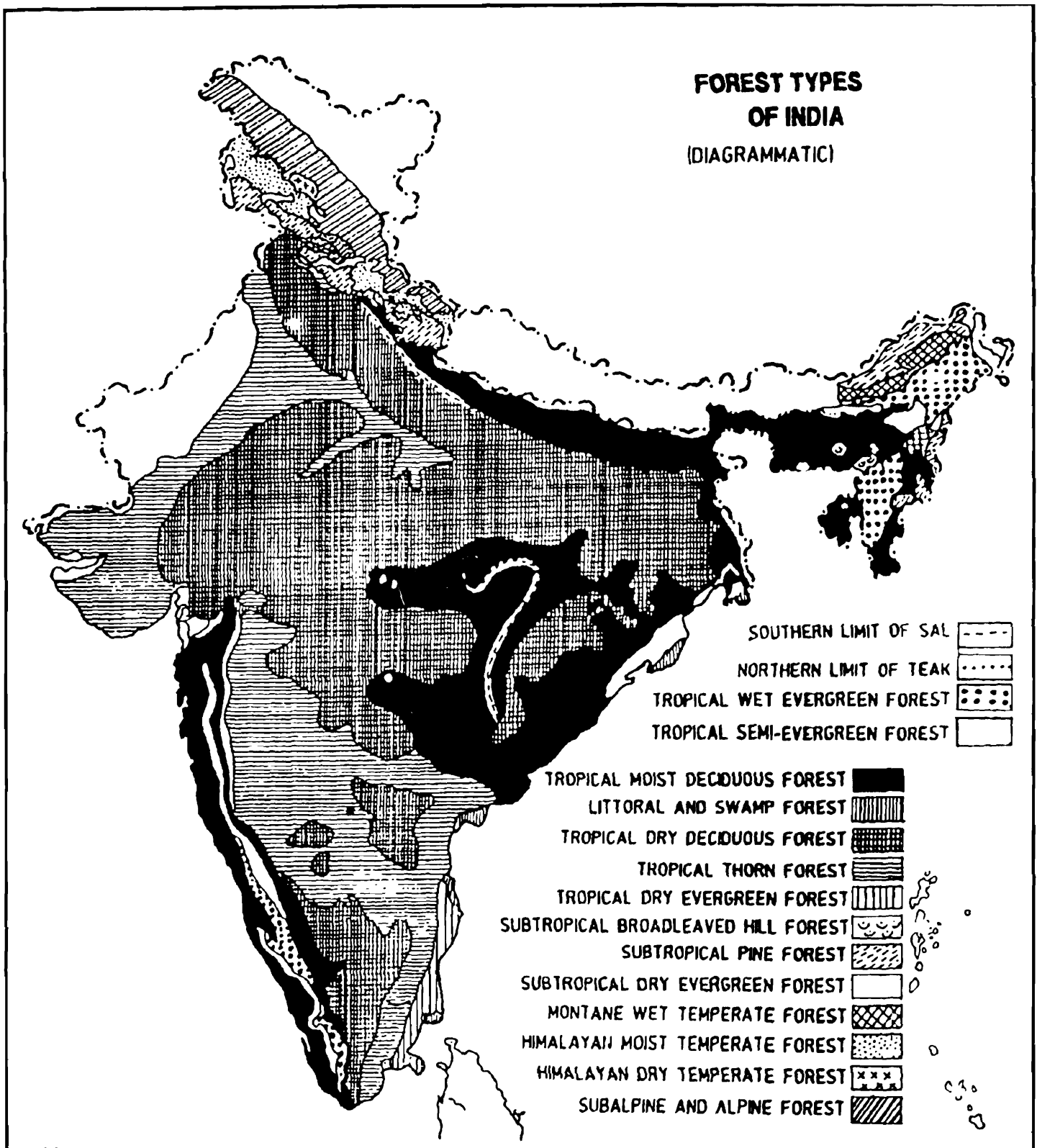


Fig. 8. Map showing Forest Types of India (Diagrammatic)

The analysis done in the present context is mainly based on the faunal strength and distribution of the tribe Xyleborini, along with citing some examples of the non-Xyleborine taxa occurring in the country.

However, out of the total of 59 genera known from India, some genera, namely *Coccotrypes* Eichhoff, *Hypothenemus* Westwood, *Xyleborus* Eichhoff including others are well spread in the country with good number of species being distributed from the northern temperate Himalayan tracts to southern tropical plains. There are numerous genera in the country each represented by 5-8 species. On the other hand, the genera, namely, *Cryptoxyleborus*, *Eccoptyterus*, *Tomicus*, are among many containing only a single species and occur in some isolated pockets.

In the present context, the detailed distribution range of 97 species under 15 genera belonging to a single Tribe Xyleborini has been dealt under the Systematic Account. However, out of 15 genera, the genera, namely, *Euwallacea* (11 spp.), *Xyleborus* (18), *Xylosandrus* (14), *Cyclorhipidion* (8) are quite common throughout the country. While the genera, *Cryptoxyleborus*, *Leptoxyleborus*, contain single species in each indicating their sparse representation. Other genera are mostly represented by 3-5 species in each with exception of *Xyleborinus* (7 spp.) and *Coptodryas* (8) with more number of species.

*Faunal Composition in different Physiographic Regions* : It would be of some interest to analyse the pattern of faunal composition and affinities within and between four different well defined physiographic units in the country as already referred to above.

Out of 117 Xyleborine species, 61 species occur in the Himalayan tract, of which 12 species are endemic to the area. This subregion has maximum heterogeneity in its Physico-climatic set up, particularly, the sub-Himalayan tract. This subregion has been proved to be very rich in scolytid fauna as a whole as evident from the record of 112 species under 18 genera only in the sub-Himalayan tract of West Bengal (Saha, 1985; Saha and Maiti, 1992).

Among the non-Xyleborine, the temperate genera, namely, *Ips* (2 spp.), *Xyleschinus* (4), *Hyorrhynchus* (4), *Diaperus*, *Scolytus*, *Polygraphus*, *Carphoborus*, etc. occur in this mountain belt, which are less common in the tropical forests in the plains.

The Scolytid fauna of the eastern Himalaya is certainly a product some unrelated groups being accumulated from different sources from the Orient including a few from the other Zoogeographical Regions and of its own restricted fauna.

The vertical distribution pattern of scolytids studied in the sub-Himalayan West Bengal (Saha and Maiti, 1992) shows that the maximum concentration of 64 species found from the Plains to Lower Hills (50 m-900 m), 6 in the Middle Hill (900 m-1500 m) and 26 in the Upper Hills, while 15 species occur in the entire range from the plains to the upper ranges. This distribution pattern shows some correlation with distribution of different forest types in the area.

The Gangetic Plains running from the Punjab plains in the west to the Bengal basin in the east, contains only a few Xyleborine species mostly belonging to the genus *Xyleborus* including some allied genera. This vast fertile tract being a transitional zone between the Himalaya and the Peninsular units, is impoverished in beetle species. This may be largely due to many anthropogenic factors, like rapid extension of agriculture, aquaculture urbanization and industrilization etc. including the removal of natural vegetation in the area in a faster rate.

The Peninsular subregion—the oldest landmass in the southern India, supports very sparse fauna in general including quite a number of endemic species. The non-xyleborine species are *Hylesinus doluus* Schedb, *Carphoborus boswelliae* (Stebbing), *Crenoidicticus minor* Eggers, *Cladactoporus scrofa* Schedl, *Xylecleptes indica* Schedl. The genus *Coccotrypes* Schedl is represented in the area by its three endemic species, in addition to few more species, namely, *Ambrosiodmus xanthopus* (Eichhoff), *Ewallacea* sp. and *Xylosandrus buttamali* (Eggers) are on record.

The insular unit includes the groups of Andaman and Nicobar Islands which is known to support to total of 78 species under 24 genera (Maiti and Saha, 1986). The endemic species, namely, *Coccotrypes nigronitens* (Schedl), *C. trevori* Beeson, *Webbia turbinatus* Maiti and Saha and *Xyleborus shiva* Maiti and Saha are so far known from the area.

*Faunal Affinity* : Whatever may be the magnitude of the Indian Scolytid fauna, it becomes a point of immense interest to analyse the affinities with that of the different countries well within and the outside the Orient. India being situated within the Oriental region, its fauna obviously shows strong affinities to that of the Orient. However, this is true that the fauna of India is a combination and product of heterogeneous elements from different foreign countries as well as its own endemic elements. Before determining the detailed range of distribution of total species, this analysis as done here, no doubt, remains tentative.

Out of 97 Xyleborine species (dealt in Vol. 1, Part-I) under 15 genera, 39 species are endemic to India and the remaining 58 are Oriental in distribution. Of these 58 species, 26 are purely oriental, 8 distributed in the circumtropics (cosmopolitan), 7 in the neighbouring countries of India, like Sri Lanka, Myanmar, Nepal and Bhutan; 8 in the Papua; 7 in Japan and 2 in Africa.

The scrutiny of the distribution pattern of these beetles shows some differential faunal affinities to the different zoogeographical Regions of the World, apart from their strong similarity to the Orient. The fauna shows some close similarity with the Papuan followed by Palaeartic and the Ethiopian Regions. However, there are quite a number of cosmopolitan species, some of which may be introduced or intersepted through comercial logs. Within the Orient, the Indian elements show strong similarity to that of Indo-Malayan, rather than that of the Indo-Chines subregion of the Oriental Region. Such Indo-Malayan faunal deminance in the Indian elements as concluded here, is contradicted by Saha and Maiti (1992) in their study of Scolytidae of the sub-

Himalayan West Bengal. The authors are of opinion that the sub-Himalayan fauna got much contribution from the Chinese elements due to their close proximity as well as with its well defined mountain dispersal routes than that of the Malayan subregion. The same authors have, on the other hand, concluded that the Nicobarese Scolytids have close affinities to the Indo-Malayan elements rather than that of the Indo-Chinese which has more similarity with the fauna of the Andaman groups of Islands (Maiti and Saha, 1986). It may be concluded that the Scolytid fauna of India is certainly a heterogenous product of some unrelated groups of Scolytids being accumulated from different source countries of the Oriental Region including a few from the other Regions (namely, Papuan, Australian, Palaeartic and Ethiopian Regions) and of its own restricted fauna.

### SYSTEMATIC ACCOUNT

**History of Classification of Scolytidae** : Linnaeus (1758) in his tenth edition of *Systema Naturae* listed five species of Scolytid beetles, all of which were treated in the composite genus *Dermestes* of the order Coleoptera. *Scolytus* was the first genus established by Geoffroy (1762) when family group categories did not exist. Subsequently, when the family group names were introduced, early authors placed scolytid genera in various groups of Coleoptera, such as, Bostrichi or Bostrichidae (Latreille, 1804), Erichson, 1836, Curculionites or Curculionidae (Latreille, 1807) or the non-Linnean Xylophage (Ratzeburg, 1837; Eichhoff 1864), Scolytarii was the first valid family-group name being established by Latreille (1807) as a subdivision of Curculionites based on the genus *Scolytus* Geoffroy. Subsequently, there has always been some confusion and difference of opinion among the workers and they have subdivided the group into a complex system of subfamilies and tribes. However, the second valid family group name is Hylesinen (*Hylesinus* Fabricius used by Erichson, 1836) within the Scolytidae. The third such name, the Tomicidae (*Tomicus* Latreille) was introduced by Thomson 1859, which included tribes Hylesinina, Tomicinina and Scolytinina. These three major groups were used as subfamilies of the Scolytidae by most of the authors since 1859. Few authors, however, have added one or more subfamilies through the division of one or more of these three family-group names.

Since, 1859, different authors proposed a complex system of classification of Scolytidae which as briefly discussed taking significant aspects into account. Wood (1978) is of opinion that the genera contained in the group bearing similar and or identical names in these classification are often quite different except for their type genera.

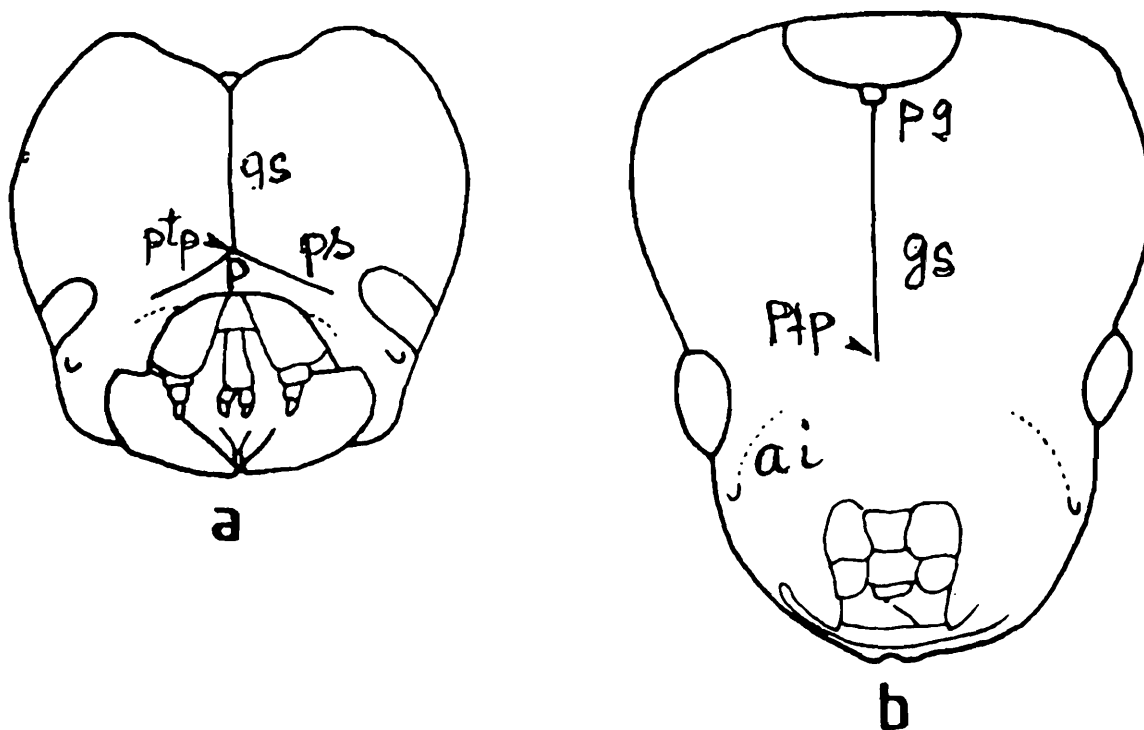
Some of the most conspicuous contributions in the classification of the group are briefly sketched below in chronological sequence.

Chapuis (1866) divided the family Scolytides into two tribes, namely *Scolytides* and *Platypodides* (Platypodidae), of which the former one containing groups, such as,

*Hylesinides*, *Camptocerides*, *Eutomides* (not a scolytid), *Phloeotrupid*, *Tomicides* and *Scolytides*. Latter on, the same author (1869) retained the *Scolytides*, *Tomicides* and *Platypodides* (Platypodidae) as three of several major divisions of the suborder Phytophaga. He included 9 tribes under *Scolytides*.

Lindemann (1876) used the well recognised names, *Hylesinidae*, *Tomicidae* and *Scolytidae*, and added three more names *Dryocoetidae*, *Xyloteridae* and *Cryphaloidae*.

Leconte (1876) proposed the tribal names (i) *Hylurgini* with subtribes *Polygraphi*, *Phloeotribi*, *Hylurgi*, *Crypturgi* and *Hylastes*; (ii) *Scolytini* and (iii) *Tomicini*, with subtribes *Corthyli*, *Xyloteri*, *Xylebori*, *Tomici* and *Micracides*.



**Fig. 9 :** *Ips mexicanus* (Scolytidae), ventral view, a. b (after Wood, 1973) : ai = antennal insertion or scrobe; gs = gular suture; p = preular; pg = post gula; ps = preular suture; ptp = posterior tentorial pit (wood, 1982).

Eichhoff (1878) dealt with *Tomicini* in which he recognised as many as 14 subfamilies. Bedel (1888) used the tribal names *Hylesinini*, *Crypturgini* and *Scolytini*.

Blandford (1893 a, b) referred to as many as nine tribal designation and subsequently the author (1896) placed four groups, namely, (1) *Scolytides* with 3 subgroups, (2) *Hylesinides*, (3) *Hexacolides* and (4) *Tomici* with six subgroups.

Hagedorn (1908, 1909, 1910 a, b, c) established four new non-Linnean subfamilies based on the structure of mouth parts with tribal names designated as (1) *Pilidentatae* for *Phloeotrupid*, (2) *Spinidentatae* for *Eccoptoterinae*, *Diamerini*, etc., (3) *Sactidentatae* for *Xyleborinae* and *Corthylinae* and (4) *Mixtodentatae* for *Scolytoplatypinae*.

Nsüslin (1911-1912) recognised as many as 14 subfamilies including the tribal name *Ipini*, while Reitter (1913) retained 11 tribal names.

Hopkins (1915) classified the group into three families, namely, *Ipidae* with ten subfamilies, *Scolytidae* with six subfamilies and *Scolytoplatypodidae* with one only.

Chamberlin (1939) reduced the number of subfamilies into five only.

Murayama (1954) recognised as many as 15 subfamilies. One of the most acceptable classification was that of Schedl (1959) who divided the family into four subfamilies with the tribes distributed as follows : (1) *Hylesinae* containing *Phloeoborini*, *Hylastini*, *Strombophorini*, *Phloeosini*, *Diamerini*, *Polygraphini*, *Hypoborini*; (2) *Xyloctoninae*; (3) *Ipinae* containing *Cryphalini*, *Crypturgini*, *Pityophthorini*, *Microcini*, *Ipini*, *Xyleborini* and *Xyloterini*; and (4) *Scolytoplatypodinae*.

However, the most authentic classification of the family has been proposed by Wood (1978) based on the study of world representatives of the group. The same system has been furnished by Wood and Bright (1992 a) in their World Catalogue on the family which stands as follows :

Subfamily	HYLESININAE	Subfamily	SCOLYTINAE
* Tribe	HYLASTINI	Tribe	SCOLYTINI
Tribe	HYLESININI	* Tribe	CTENOPHORINI
Tribe	TOMICINI	Tribe	SCOLYTOPLATYPODINI
* Tribe	PHRIXOSOMINI	* Tribe	MICRACINI
Tribe	HYORRHYNCHINI	* Tribe	CACTOPININI
Tribe	DIAMERINI	Tribe	CARPHODICTICINI
* Tribe	BOTHROSTERNINI	Tribe	IPINI
* Tribe	PHLOEOTRIBINI	Tribe	DRYOCOETINI
Tribe	PHLOEOSININI	Tribe	CRYPTURGINI
Tribe	HYPOBORINI	Tribe	XYLOTERINI
Tribe	POLYGRAPHINI	Tribe	XYLOBORINI
		Tribe	XYLOCTONINI
		Tribe	CRYPHALINI
		Tribe	CORTHYLINI

**Classification Followed :** The classification of *Scolytidae* as cited above, has been followed in the present context for the Indian scolytid-fauna. The world fauna of *Scolytidae* as per present estimation stands to a total of 5,812 species belonging to

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Tribes marked with asterisk (\*) not represented in India

225 genera under 25 tribes of two subfamilies, (namely, Hylesininae and Scolytinae). The present account deals with the tribe Xyleborini containing 117 species under 15 genera from India.

**History of Scolytid Study in India :** The first species of scolytidae in India was described by Hornung (1842) as *Bostrichus areccae*, a species recognised under the family Bostrichidae. At that time, the scolytid genera were placed in various groups of Coleoptera, such as Bostrichi or Bostrichidae (Lateralle, 1804; Erichson, 1836) or Curculionidae (Latreille, 1807) or Non-Linnaen Xylophaga (Eichhoff, 1864). The species referred to above is now recognized as *Hypothenemus areccae* (Hornung) of the subfamily Scolytinae under the family Scolytidae.

Since then numerous species have either been described or reported from the country mostly by the foreign workers. Hagedorn (1910) was the first author to catalogue as many as 43 species from India. However, the scrutiny of the existing literature clearly indicates the numerical strength of species either described or reported by different authors which are briefly dealt herewith.

Four species of scolytids were described by Motschulsky (1863) from India, of which only *Xyleborus bidentatus* stands valid even to-day. Subsequently, quite a number of new species was discovered by different authors, such as, one species by Chapuis (1869), five species under three genera by Eichhoff (1879), eleven species including nine new species by Blandford (1893, 1894a, 1894b, 1896a, 1896b, and 1898), seven species under three genera by Hagedorn (1904, 1908 and 1909), four species under four different genera by Strohmeier (1908). Stebbing (1902-6, 1907, 1908, 1909 a,b; 1911, 1914 a,b) took earnest effort to explore the scolytid fauna of India and its neighbouring countries with special emphasis to study the biology including taxonomy of the group. At the same time, he described about 26 new species and recorded 14 known species to bring to a total of 40 species all together. However, large majority of species stand valid even today except a few being synonymised as well as transferred to different genera. Sampson (1913, 1919, 1922 and 1923) also added 6 new species and recorded some known species. Egger's contributions (1923, 1927, 1930 and 1936) were by far the most significant one dealing with the description of as many as 38 species (Eggers, 1930) under a single genus *Xyleborus*. He also added 5 more new species under different genera to the existing list.

As a Forest Entomologist at the Forest Research Institute, Dehra Dun, Beeson exhaustively collected and studied the scolytids of the Indian subcontinent. Beeson (1915, 1916, 1921, 1922, 1929, 1930, 1935 a,b; 1939, 1940 and 1941) described about 30 species, of which half a dozen of species had been synonymised by the subsequent authors. In his famous book on 'Ecology of Forest Insects', Beeson (1941) dealt with numerous species including a few remaining as *nom. nud.*, out of which a number of species was later on described as new species by Schedl, Maiti and Saha (1986, 1989) and Wood.

In the Post Independent period (after, 1947) in India, major contributions were made by Schedl (1934, 1938, 1942, 1950, 1951, 1952, 1958, 1959, 1963, 1966, 1967, 1967 a, 1967 b; 1969, 1971, 1971 a, 1972, 1973, 1975 b, 1980) resulting into addition of 15 new species including numerous new records. Recently, Kumar and Chandra (1977) described unknown males of some ten species already known only by the female from the country.

The list of different forest plants infested by different beetles as well as scolytids have been published by many authors, especially, Bhasin and Roonwal (1954), Mathur and Singh (1959, 1969 a,b; 1961), Bhasin, Roonwal and Singh, 1958. However, the scientific data dealt by these authors are mainly based on the contribution of Stebbing (1914), Beeson (1941) and others, as well as the informations in leader files and cards of F.R.I., Dehra Dun. To avoid repetition, these references are not included in the synonymies of respective species.

The study of Indian Scolytid-beetles gets its maximum momentum from 1979 onwards, when the present authors initiated systematic investigation on the group with special emphasis on State-wise faunal study and lay a foundation on which the present contribution is based upon. Prior to undertaking the present study, no serious attempt had even been made to study the group as a whole systematically, with reference to their current classification, nomenclatural status, framing of keys, specifying diagnostic characters, list of synonymies, range of variation and distribution of different species, etc. All these aspects have been carefully considered for the first time in this book. The scolytid fauna of Sikkim was so far poorly known until 9 species including 7 new records were made by Saha and Maiti (1984). The Bay Islands seem fairly rich in Scolytid-beetles containing 58 species under 24 genera including 17 species as new records and two as new species. Each of these species was taxonomically well treated by Maiti and Saha (1986) with reference to its synonymies, diagnosis, range of distribution and variation, biological and taxonomic remarks, etc. This is the first comprehensive taxonomic monograph of Scolytidae for any State in India. Review of *Arixyleborus* Hopkins was made by Saha and Maiti, 1987a. Description of hitherto unknown males from India under the genus *Xyleborus* was a further addition to our knowledge (Saha and Maiti, 1987b).

The review of the species from the sub-Himalayan West Bengal under the genus *Xylosandrus* Reitter along with description of a new species had been done by Saha *et al.* (1992a). The comprehensive account of Scolytid fauna of West Bengal dealing with taxonomic treatment of 107 species including 30 new records, especially from the sub-Himalayan tract of West Bengal had been done by Saha (1985), Saha and Maiti (1996). These beetles from Meghalaya had also been studied by Saha and Maiti (2000).

## Key to the Genera

1. Antennal funicle with 3-4 segments (Fig. 25,b) ..... 2
- Antennal funicle always with 5 segments (Fig. 10,b) ..... 3
2. Elytral apices completely truncated, truncate margin forming circumdeclivital costa with spine-like processes (spiny structure absent in male); pronotal asperities on antero-lateral corners comparatively prominent (Fig. 57,c) ..... *Webbia* Hopkins
- Elytral apices not truncate, rather continuous; pronotal asperities more prominent on antero-median portion ..... *Cnestus* Sampson
3. Scutellum submerged below the level of basal margin of elytra, not visible from above, if at all visible, visible on anterior declivous slope of elytral basal margin, and scutellar notch not prominent ..... 4
- Scutellum not submerged below the level of basal margin of elytra, distinctly visible from above, variable in shape and size and scutellar notch prominent ..... 7
4. Scutellum submerged, not at all visible; entire basal margin of each elytron somewhat margined and outcurved at the level of interstriae 4 and 5 (Fig. 28,a) ..... *Coptodryas* Hopkins
- Scutellum submerged below the level of elytral basal margin, but visible on anterior declivous slope of elytral basal margin; basal margin of each elytron neither margined nor outcurved, rather somewhat rounded and substraight .... 5
5. Antennal club dorso-ventrally flattened, anterior margin of basal corneous portion on both the faces distinctly procurved (Fig. 34, e); each elytron terminating into a strong acute apex (Fig. 34, a) ..... *Cryptoxyleborus* Schedl
- Antennal club obliquely truncate, basal corneous portion forming a complete ring with recurved costate apical margin on anterior face, posterior face unmarked by any distinct suture; each elytron terminating into a broadly rounded apex .... 6
6. Metatibiae much enlarged in width, without any socketed row of teeth on anterior margin, metatarsi compressed (Fig. 41,d); elytral declivity excavate, excavate margins with pointed spines of equal sizes (Fig. 41, a) ... *Eccoapterus* Motschulsky
- Metatibiae normal in size, not enlarged and with socketed row of teeth on anterior margin; metatarsi normal, not compressed; elytral declivity not excavated, rather depressed, depressed margin without any pointed tooth ..... *Hadrodemius* Wood
7. Scutellum small and conical, not filling up the entire scutellar space; scutellum surrounded by dense coat of hairs (Fig. 61,c); postero-lateral margins of elytra with series of tubercles, but devoid of any carina; anterior margin of pronotum always unarmed ..... *Xyleborinus* Reitter
- Scutellum round or triangular and filling up the entire scutellar space [except, *Euwallacea tristis* (Eggers)]; scutellum not surrounded by dense coat of hairs;

- postero-lateral margins of elytra with or without tubercles, anterior margin of pronotum either armed or unarmed ..... 8
8. Procoxae narrowly to widely separated ..... *Xylosandrus* Reitter
- Procoxae contiguous ..... 9
9. Protibiae inflated on posterior surface and inflated surface always with granules ..... *Arixyleborus* Hopkins
- Protibiae on posterior face not exactly inflated, but always devoid of granules... ..... 10
10. Pronotal asperities extending almost upto the basal margin (Fig. 18,a) ..... *Ambrosiodmus* Hopkins
- Pronotal asperities not extending upto basal margin ..... 11
11. Apical margin of basal corneous portion of antennal club sharply elevated, forming a complete ring (except *X. major*), segment 2 not distinctly chitinized ..... 12
- Apical margin of basal corneous portion of antennal club round; segment 2 comparatively large and distinctly chitinized ..... 13
12. Postero-lateral margins of elytra either carinate or acutely margined; pronotum somewhat rectangular; anterior margin of pronotum either armed or unarmed ..... *Xyleborus* Eichhoff
- Postero-lateral margins of elytra rather rounded (sometimes, apical half somewhat acute); pronotum ovoid; anterior margin of pronotum usually armed (except in *Cyclorhipidion inarmatus*) ..... *Cyclorhipidion* Hegedorn
13. Declivital summit placed much above the middle; declivital face with confused dense scales; lower half of declivity broadly impressed, and flatly concave ..... *Leptoxyleborus* Wood
- Declivital summit placed on or below the middle; declivital face with erect hairs only; lower half of declivity not impressed, but flatly convex ..... *Euwallacea* Hopkins

### ABBREVIATIONS USED

alt. – Altitude

B.M. Nat. Hist. – British Museum Natural History, London

Brussel Mus. – Brussel Museum, Switzerland

F.R.I. – Forest Research Institute, Dehra Dun, India

IRNSB – Institute Royal des Sciences Naturelles de Belgique, Brussels

Km. – Kilometre

Leyden Mus. – Leiden Museum, Netherlands

m. – Metre

mm. – Milimetre

Nat. Hist. Mus. Wien. – Naturhistorische Museum Wien, Austria

*pers. comm.* – Personal Communication

U.S. Nat. Mus. – United States National Museum of Natural History, Washington

Z.S.I. – Zoological Survey of India, Calcutta

### TAXONOMIC ACCOUNT

Family SCOLYTIDAE

Tribe XYLEBORINI

Genus *Amasa* Lea

#### 1. *Amasa* Lea

1893. Lea; *Proc. Linn. Soc. New South Wales*, **8** : 322.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 681.

#### 2. *Pseudoxyleborus* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, **14** (9) : 30-31.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 681 (Synonymy).

#### 3. *Anaxyleborus* Wood

1980. Wood, *Gt. Basin Nat. Mem.*, **40** (1) : 90.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. paper* No. 86 : 62.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 681 (Synonym).

*Type of genus* : (1) *Amasa* : *Amasa thoracica* Lea = *Tomicus truncatus* Erichson; (ii) *Pseudoxyleborus* : *P. beelsoni* Eggers; (iii) *Anaxyleborus* : *Xyleborus truncatus* Erichson.

The monobasic genus *Pseudoxyleborus* was erected by Eggers (1930) to accommodate the species, *P. beelsoni* Eggers from Myanmar. Subsequently, Schedl, (1936) revised the generic diagnosis based on the characters of antennal club and eyes, and found it justified to include under it a number of species belonging to the *truncatus* group of the genus *Xyleborus*. According to him, the antennal club is compressed, unmarked

by any suture on either face and the eyes are either entirely separated into two parts or connected by a single row of facets. However, Wood (1982) denied the validity of the genus *Pseudoxyleborus* and put it under the genus *Xyleborus*. Subsequently, the same author (1980) retained its generic status, but ultimately synonymised the genus under *Amasa* Lea (Wood and Bright, 1992).

Wood (1972) created a new genus, *Anaxyleborus* with the inclusion of the truncatus - group of *Xyleborus* based on the truncate declivity with a complete sharply elevated circumdeclivital costa and antennal club with sutures on either face. This group is now considered under the genus *Amasa* (Wood & Bright, 1992). The truncate elytral margin with circumdeclivital costa and contiguous procoxae seem to be very sound character based on which five species assigned to the genus. *Amasa geminatus* Hagedorn reported from West Bengal has not been included in the present fauna due to non-availability of any material.

#### **General characters of genus *Amasa* Lea based on females.**

*Description : Female* : Body broadly or narrowly cylindrical; pronotum yellowish to dark brown, elytra rather darker; head, antennae and legs light brown. Body length 2.50-3.20 mm, 2.3-2.8 times as long as wide.

Head globose, frons weakly convex, surface finely reticulate with scattered punctures, anteriorly granulate at times, median line indistinctly marked with central dot-like depressed area as in *A. beelsoni* and *A. schlichii*. Eyes oblong, more than half of its width emarginate. Antennal scape either stout or elongate, funicle with 5 segments, club generally obliquely truncate, but sometime somewhat flat, devoid of distinct basal corneous portion (*A. eugeniae*).

Pronotum as long as broad or either longer or broader than long, basal margin substraight or weakly bisinuate, basal third of lateral margins subparallel, and anterior margin broadly rounded with weak median projection accommodating 6-8 small transverse asperities; summit either slightly above the middle or at anterior third, declivous portion with asperities and sparse hairs, portion below the summit smooth and shiny with sparse punctures and hairs, sometimes punctures inconspicuous.

Scutellum smooth and shiny, either subtriangular or tongue-shaped.

Elytral apex truncate, face subvertical, margin elevated, forming a complete circumdeclivital costa, with a row of fine hairs; lateral sides subparallel; discal striae generally not impressed, marked by shallow distinct punctures; interstriae much wider than striae with minute punctures and hairs, sometimes hairs inconspicuous. Declivital face plano-concave to plano-convex with slight elevation at sutural apex; face with 3-6 striae, marked by distinct large punctures, interstriae more or less flat with uniseriate minute granules and hairs, granules and hairs sometimes inconspicuous. Procoxae contiguous, protibiae with 5-7 and mesotibiae with 8 teeth.

**Key to the species of *Amasa* Lea based on females**

1. Declivital face marked by five strial lines and its face distinctly raised, especially towards elytral apices along the sutural line; elytra upto upper truncate margin shorter than pronotum ..... *A. resecans* (Eggers)
- Declivital face marked by three strial lines; face plano-concave and sometimes feebly raised towards elytral apices along the sutural line; elytra upto upper truncate margin longer than pronotum ..... 2
2. Body somewhat cylindrical and elongate; pronotum distinctly shorter than elytra; elytra parallel sided and much longer than its own width .....  
..... *A. euginae* (Eggers)
- Body short and stumpy, pronotum as long as elytra, elytra feebly divergent posteriorly and as long as its own width ..... 3
3. Body large, frons with a few deep punctures on the reticulate surface; pronotal summit prominent, placed above the middle, weakly granulate below the summit .....  
..... *A. versicolor* (Hopkins)
- Body small, frons without any deep puncture; pronotal summit indistinct, placed almost at the middle, not granulate below the summit, rather smooth and shiny .....  
..... *A. schlichii* (Stebbing)

1. *Amasa euginae* (Eggers)  
(Fig. 10)

1. *Xyleborus euginae* Eggers

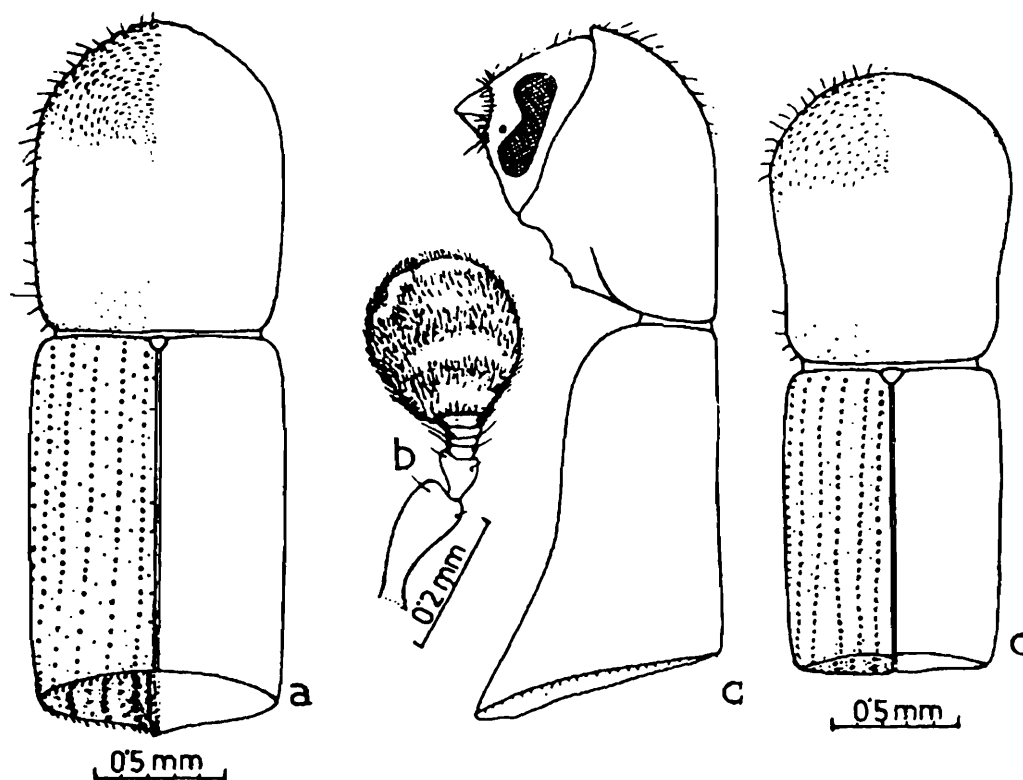
1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 183-184, *Holotype* Female in F.R.I., Dehra Dun. *Type-locality* : Dehra Dun, Uttar Pradesh, India.
1934. Gardner, *Indian Forest Rec. (Ent.)* 20 (8) : 16 and 17.
1959. Schedl. *Trans. R. ent. Soc. Lond.*, 111 : 511.

2. *Amasa euginae* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 683
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 806, Fig. 10, a-b.

*Description : Female* : Body cylindrical, head yellowish brown, pronotum yellowish brown to reddish brown, elytra rather darker. Body length 2.70-2.90 mm, 2.7-2.8 times as long as wide.

Frons weakly convex, surface finely rugose, devoid of any distinct median line and with a smooth central dot-like depressed area at the level of eyes and a few scattered



**Fig. 10 :** *Amasa eugeniae* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, antenna; c, head, pronotum and elytra in lateral view. Male : d, Pronotum and elytra in dorsal view.

sparse punctures and hairs. Antennal club somewhat flat without any distinct basal corneous portion, anterior face with two indistinct sutural lines marked by hairs, posterior face devoid of any distinct suture.

Pronotum 1.2 times as long as wide; basal margin substraight; lateral sides subparallel upto basal two-thirds, anterior margin broadly rounded accommodating asperities, asperities 6-8 distinct; summit not at all pronounced somewhat marked at anterior one-third; anterior declivous portion with small asperities and with dense bent hairs; nearly posterior two-thirds below the summit finely rugose with sparse minute shallow punctures, hairs inconspicuous except a few placed laterally.

Scutellum smooth and tongue-shaped.

Elytra upto truncated margin 1.10-1.16 times as long as pronotum and 1.3 times as long as its own width; basal margin substraight, discal striae not impressed, punctures rather small but distinct and distantly placed; interstriae 3-4 times wider than striae, surface smooth and shiny with uniseriate row of sparse small and shallow punctures, hairs inconspicuous except on lateral sides. Declivital truncate face shiny, plano-concave except slightly elevated at sutural apex and with only three striae; strial punctures larger than those on disc; interstria 1 with uniseriate close granules gradually becoming larger towards apex, rest of the interstriae smooth and with scattered minute granules, hairs inconspicuous. Procoxae subcontiguous; protibiae with 7 and both meso- and meta-tibiae with 8 teeth each.

*Male* : The males are similar to females, but body from comparatively more convex and weakly developed, colour yellowish to blackish brown, antennae and legs paler; body length 2.40 mm.

Frons convex, surface finely rugose, with fine hairs, but punctures inconspicuous, sometimes with a weak median line.

Pronotum 1.3 times as long as wide, lateral sides weakly diverging anteriorly, anterior one-third broader; anterior margin broadly rounded and unarmed; less than anterior half with weak asperities and fine hairs; posterior half finely punctate and hairs inconspicuous.

Elytra upto truncated margin slightly shorter than pronotum; discal striae marked by distinct but small punctures and interstriae with comparatively smaller irregular punctures; truncated margin devoid of any distinct circumdeclivital costa (as in female) and elytral apex feebly emarginate; truncated face with 3 distinct striae marked by distinct punctures; interstriae with fine uniseriate punctures, interstria 1 feebly elevated; elytral hairs inconspicuous.

*Distribution* : INDIA : *Uttar Pradesh* : Dehra Dun; *West Bengal* : Darjiling Dist. : Sukna and Samsing. ELSEWHERE : Sri Lanka.

*Hosts* : *Eugenia formosa*, *E. jambolana* and *Elaeocarpus* sp.

*Remarks* : *Amasa eugeniae* is the current scientific name of *Xyleborus eugeniae* Eggers and is so far known sparsely from some widely spread localities in the Indian region including Sri Lanka. Colour generally varies from yellowish brown to blackish brown. Specimens from Samsing smaller than the type specimens. Biology of the species is unknown except known to bore the dead branches of the host mentioned above (Beeson, 1930 and 1941).

## 2. *Amasa resecans* (Eggers)

(Fig. 11)

### 1. *Xyleborus resecans* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 148, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Sibsagar, Assam, India.

1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 253.

### 2. *Anaxyleborus resecans* (Eggers)

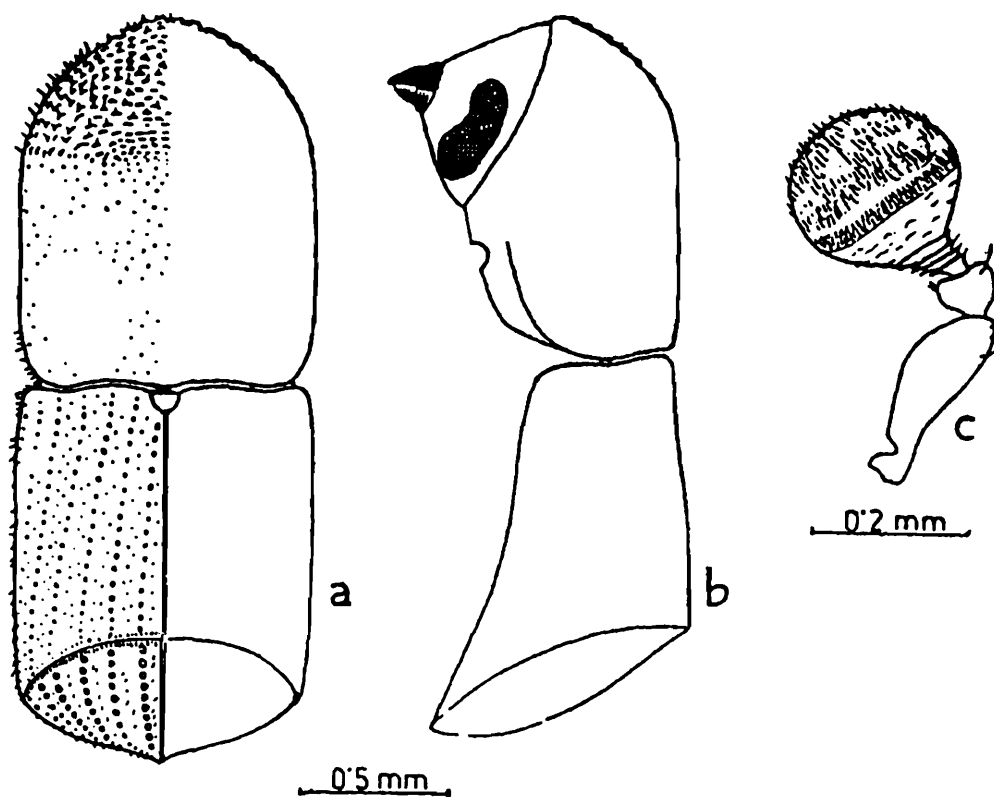
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 62-64, Fig. 13, a-c.

### 3. *Amasa resecans* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem. No. 13 (Vol.-A)* : 684

**Description : Female :** Body short and cylindrical; head deep black, pronotum and elytra comparatively less black; legs brownish black. Body length 2.55 mm, 2.3 times as long as wide.

Frons weakly convex with distinct median line unlike other species with fairly big puncture, reticulate posteriorly and granulate anteriorly. Antennal club with segment 1 corneous; on anterior face, basal corneous portion with weakly procurved apical margin; face truncate with one procurved distinct suture; posterior face devoid of any suture.



**Fig. 11 :** *Amasa resecans* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head pronotum and elytra in lateral view; c, antenna.

Pronotum 1.17 times as long as wide; basal margin bisinuate; lateral sides subparallel, anterior margin broadly rounded accommodating asperities, asperities 6-8 distinct with erect hairs; summit indistinct on anterior one-third; declivous portion with asperities gradually becoming prominent and extending beyond summit; posterior two-thirds finely rugose with fairly close minute shallow punctures.

Scutellum smooth and tongue shaped, weakly depressed medially.

Elytra upto truncated margin 1.4 times shorter than pronotum and slightly shorter than its own width; basal margin outcurved upto the level of interstria 4; discal striae weakly marked with very fine punctures; interestriae smooth and shiny with minute punctures, but devoid of any hair; surface with a few transverse weak scar marks.

Declivital truncate face distinctly outbulged specially toward elytral apex, either sides of which rather depressed; declivital striae very much distinctly marked by large, moderately deep punctures, striae 3, 4 and 5 confluent and almost meeting below the middle of declivity; interstriae smooth and shiny, sutural one wider and slightly raised towards apex; interstriae with a few fine hairs. Protibiae with 5 small teeth.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Sibsagar, Central Range, Andaman Islands. ELSEWHERE : None.

*Hosts* : *Dipterocarpus pilosus* (from Sibsagar) and *D. turbinatus* (from the Andamans).

*Remarks* : The species was transferred to the genus *Anaxyleborus* by Maiti and Saha (1986) inspite of lacking any visible suture on the posterior face of antennal club. This remains tentative until further material are available for detailed study. Biology of the species is quite unknown except its host record (Beeson, 1941).

### 3. *Amasa schlichii* (Stebbing) (Fig. 12)

#### 1. *Acanthotomicus truncatus* Stebbing

1907. Stebbing, *Indian Forest Bull.*, 11 : 40, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Goalpara, Assam, India.

#### 2. *Xyleborus schlichii* (Stebbing)

1914. Stebbing, *Indian Forest Insect (Coleopt.)* p. 592 (*nom. nov.*).

1978. Beaver and Browne, *Oriental Ins.*, 12 (4) : 613.

#### 3. *Amasa schlichii* (Stebbing)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 684.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 806.

#### 4. *Xyleborus glaber* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 185-186, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Halflong, Assam, India.

1971. Schedl, *Oriental Ins.*, 5 (3) : 364.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 806 (Synonymy).

#### 5. *Xyleborus uniseriatus* Eggers

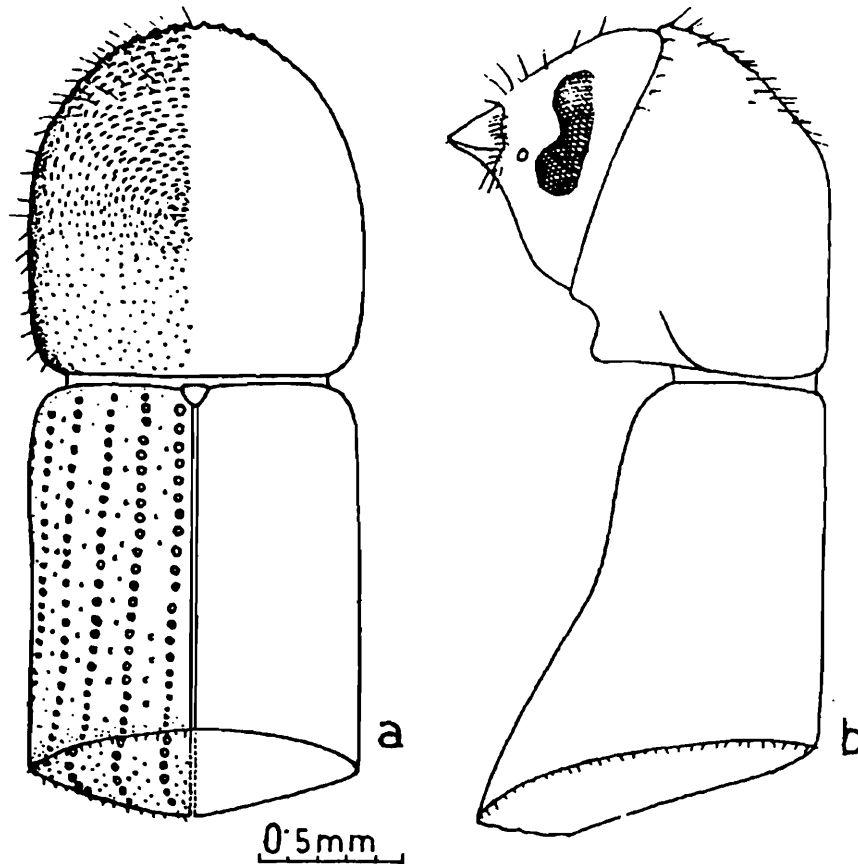
1936. Eggers, *Tijdschr. Ent.*, 79 : 89, Female Type in Mus. of Amsterdam; Allotype (Male) and 1 Paratype (Female) in Nat. Hist. Mus., Wien.

1950. Schedl, *Tijdschr. Ent.*, **93** : 80, Male.

1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 613 (Synonymy).

**Description : Female** : Body cylindrical; yellowish to brownish black in colour. Body length 2.70-3.20 mm, 2.3 times as long as wide.

Frons weakly convex, surface finely rugose, with sparse short interrupted carinulae, becoming granulate towards epistomal margin, a few sparse punctures posteriorly; a median smooth central dot-like depressed area at the level of eyes and surface with sparse fine hairs. Antennal club with segment 1 corneous with weakly procurved apical margin on anterior face, segment 2 distinct and one more suture marked by hairs apically; posterior face with one distinct suture.



**Fig. 12** : *Amasa schlichii* (Stebbing), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum as long as broad or slightly longer or broader; basal margin substraight, lateral sides subparallel, rather weakly outcurved; anterior margin broadly rounded accommodating 6-7 distinct asperities; indistinct summit slightly above middle; anterior declivous portion with coarse asperities, gradually becoming smaller and extending beyond summit and fairly densely hairy; posterior half smooth and shiny with sparse minute shallow punctures and hairs laterally.

Scutellum smooth and subtriangular.

Elytra upto truncated margin nearly as long as and as wide as its own width and pronotum; basal margin substraight, discal striae marked by close, shallow and distinct punctures becoming smaller posteriorly particularly near truncated margin; interstriae nearly 2-3 times as wide as the striae with uniseriate irregular small shallow punctures without any distinct hair. Declivital face plano-concave, rather weakly elevated towards sutural apex; only striae 1, 2 and 3 with large, shallow, distinct rather closely placed punctures, smooth and shiny inside; interstriae either flat or feebly raised, hairs inconspicuous bearing granules; procoxae contiguous, protibiae with 6 and both meso- and meta-tibiae with 9 and 10 teeth respectively.

*Male* : Male not available for study.

*Distribution* : INDIA : Assam : Goalpara and Cachar, Halflong; West Bengal : Darjiling Dist., Bagdogra and Samsingh; Jalpaiguri Dist., Apalchand Range; Sundarban. ELSEWHERE : Indonesia and Malaysia.

*Hosts* : *Anthocephalus indicus*, *Mallotus phillipinensis* and *Shorea robusta*.

*Remarks* : *Acanthotomicus truncatus* was described by Stebbing (1907) from Assam and subsequently the same author (1914) transferred the species to the genus *Xyleborus*. But, there were two more species by the same name as *truncatus* (*X. truncatus* Erichson and *X. truncatus* Sharp) under *Xyleborus*, which led Stebbing (1914) to rename the species as *X. schlichii*. Subsequently, the species *X. uniseriatus* from Java, Indonesia and *X. glaber* Eggers from Assam, India were synonymised under it.

However, *X. schlichii* was considered as one of the species of *Amasa* by Wood and Bright (1992). The specimens studied from Bagdogra are smaller measuring about 2.70 mm, whereas those from Samsingh are larger, measuring 3.20 mm. Moreover, in some of the specimens from Bagdogra, declivital interstriae are feebly raised with more granules in contrast with flat declivital interstriae with smaller sparse granules in many specimens. The species can easily be identified by its stout body from and subquadrate pronotum. The species shows strong affinity for Fagaceae as observed in Malaya (Browne, 1961) and also for Dipterocarpaceae and Euphorbiaceae in India (Beeson, 1930 and 1941).

#### 4. *Amasa versicolor* (Sampson)

##### 1. *Xyleborus versicolor* Sampson

1921. Sampson, *Ann. Mag. nat. Hist.*, 9 (7) : 29. *Holotype* : Female in B.M.N.H., London. *Type-locality* : Penang.

1960. Wood, *B. P. Bishop Mus.*, 18 (1) : 55-56.

##### 2. *Amasa versicolor* (Sampson)

1992. Wood and Bright, *Gt. Basin nat. Mem.*, No. 13 (Vol.-A) : 685.

*Description : Female* : Body short, stout and cylindrical; Head and pronotum fairly pale brown, pronotum deeper. Body length 2.60 and 2.6 long as wide.

Frons weakly convex with distinct puncture and hairs, median line finely marked. Antennae of typical *Amasa* type.

Pronotum 1.90 times as long as wide; basal margin substraight, anterior margin subround accommodating minute asperities excepting 5-6 with somewhat distinct erect hairs; summit indistinct and placed on anterior one-third; anterior declivous portion with asperities gradually becoming prominent anteriorly; posterior portion with minute punctures on shining surface.

Scutellum smooth, tongue shaped and depressed.

Elytra upto truncate margin 1.1 times shorter than pronotum and slightly shorter than its own width. Basal margin broadly concave; discal striae very weakly marked with fine punctures; interstriae smooth with very faint striae (almost indistinguishable), but devoid of any hairs; surface with very weak transverse mark. Declivital truncate face distinctly outcurved specially along the sutural line towards apex; declivital striae prominent, only three well marked, lined by distinct punctures, none reaching the posterior margin; interstriae not shining but with scattered minute granules; interstriae with sparse minute hairs.

*Male* : Unknown.

*Distribution* : INDIA : Bengal. ELSEWHERE : Myanmar, Malaysia, Sri Lanka, Indonesia (Borneo, Java), Micronesia (Caroline Isl., Ponape Isl.)

*Remarks* : The species was originally described under *Xylebous* and subsequently transferred to *Amasa*. It is a very rare species in India.

Genus : *Ambrosiodmus* Hopkins, 1915

### 1. *Ambrosiodmus* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 55.  
 1918. Swaine, *Dom. Canada Dep. Agric. Ent. Br. Tech. Bull.*, **14** : 48.  
 1961. Wood, *Coleopt. Bull.*, **15** : 46.  
 1968. Bright, *Canad. Ent.*, **100** (12) : 1296 (Synonymised under *Xyleborus*).  
 1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96.  
 1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No.* 86 : 59.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 12 (Vol.-A) : 670.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 807.

### 2. *Phloeotrogus* Motschulsky

1963. Motschulsky, *Bull. Soc. Imp. Nat. Moscou.*, **36** : 512-513.  
 1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96 (Synonymy).

### 3. *Brownia* Nunberg

1963. Nunberg, *Ann. Mus. R. Afrique Central Ser.*, 8, *Sci. Zool. Nr.*, 115, pp. 36-37.

1980. Wood, *Gt. Basin Nat.*, 40 (1) : 96 (Synonymy).

#### Type of genus :

- i) *Ambrosiodmus* : *Xyleborus tachygraphus* Zimmermann,
- ii) *Phloeotrogus* : *P. obliquecaudata* Motschulsky
- iii) *Brownia* : *Xyleborus illepidus* Schedl

Hopkins (1915) established the genus *Ambrosiodmus* based on the characteristic pronotal lower half with distinct asperities, pronotal anterior margin either armed or unarmed and elytral declivity with granules and tubercles. Recently, Wood (1980) had synonymised the genera *Brownia* Nunberg and *Phloeotrogus* Motschulsky under it. Recently, Beaver and Loytyniemi (1985) followed Wood and put some species of *Xyleborus* from Zambia under this genus. However, nine species from India may be assigned to this genus.

However, *Ambrosiodmus* is very close to *Euwallacea* but differs in having pronotum with minute asperities extending upto basal margin.

#### General characters of the genus *Ambrosiodmus* Hopkins.

*Description : Female* : Body small and cylindrical to stout and large; sparsely to densely hairy; colour yellowish brown to blackish brown. Body length 2.40-4.60 mm, 2.1-2.4 times as long as wide.

Head globose, frons flatly convex with or without any distinct median line; in some specimens transversely depressed area at the level of upper margin of eyes; surface rugosely reticulate with irregular close and sparse punctures and with sparse or dense erect hairs. Eyes elongately oval; either one third or almost half of its width emarginate. Antennal scape short and stout to long and cylindrical; funicle with 5 segments; club obliquely truncate, basal corneous portion either well developed or reduced with recurved or substraight apical margin; truncate face with two sutures; posterior face either with one or two sutures or devoid of any suture.

Pronotum subglobose to subquadrate, nearly as wide as or slightly wider than long; basal margin substraight, both lateral and anterior margins feebly outcurved, anterior margin either armed or unarmed; summit either distinct or indistinct and placed almost at the middle; asperities decreasing in size posteriorly, crescentically arranged around summit and extending upto base (one of the important characteristic features of the genus) but very much indistinct in *A. apicalis*, *A. funereus* and *A. consimilis*.

Scutellum somewhat tongue-shaped.

Elytra 1.3-1.7 times as long as pronotum, basal margin substraight, lateral sides subparallel, posterior margin broadly rounded; discal striae marked by somewhat distinct punctures, with or without any microhair; interstriae almost twice or slightly more wider than striae with either uniseriate or biseriate rows of punctures or granules, each with an erect hair. Declivity commencing from slightly either behind the middle or posterior third of elytra; declivital face either abrupt or gradually sloping posteriorly; striae with close and distinct punctures, with or without any microhair; all the interstriae (except interstria 1 in *A. asperatus* and *A. funereus*) with granules or tubercles, those on interstriae 2 and 3 rather large.

### Key to the species of *Ambrosiodmus* Hopkins based on females

1. Larger species, body length above 3.60 mm ..... 2
  - Smaller species, body length below 3.60 mm ..... 6
2. Declivital interstriae with distinct punctures, but devoid of any granules or tubercles; body stout 2.1-2.3 times as long as wide ..... 3
  - Declivital interstriae either with granules or tubercles; body form either short and stout or long and cylindrical, 1.9-2.8 times as long as wide ..... 5
3. Elytral disc uniformly convex upto commencement of declivital striae and interstriae well marked upto elytral apex; smaller species, body length 4.00-4.15 mm ..... *A. lantanae* (Eggers)
  - Elytral disc not uniformly convex, but weakly incurved between elytral base and commencement of declivity; striae and interstriae not well marked throughout, but only upto upper half of declivity, either somewhat confused or obsolete on lower half and replaced by large punctures; large species, body length 4.30 - 5.40 mm ..... 4
4. Larger species, body length 5.40 mm; pronounced hump at commencement of declivity; declivital lower half with very irregular punctures, striae somewhat confused ..... *A. dihingensis* (Eggers)
  - Smaller species, body length 4.30 mm; devoid of pronounced hump at commencement of declivity; declivital lower half with faintly regular punctures, striae not confused ..... *A. sundaensis* (Eggers)
5. Frons transversely and distinctly depressed at the upper level of eyes, area above epistomal margin fairly swollen and comparatively smooth with sparse punctures; declivital interstriae with irregular granules and tubercles; body length 4.60-4.80 mm ..... *A. lewisi* (Blandford)
  - Frons transversely and weakly depressed at upper level of eyes, area above epistomal margin not so swollen but roughened with dense punctures; declivital interstriae generally with uniseriate granules and tubercles; body length 3.60-3.70 mm ..... *A. minor* (Stebbing)

6. Tubercles on declivital interstria 2 more distinct than those on other interstriae ..... 7  
 – Tubercles on declivital interstria 3 more distinct than those on other interstriae ..... 8
7. Declivital face uneven and distinctly elevated; interstria 2 having broad based tubercles; striae rather irregular, at times being confused, face somewhat abrupt and declivity commencing from posterior third; body length 2.40-2.50 mm ..... *A. asperatus* (Blandford)  
 – Declivital face less uneven and feebly elevated; interstria 2 having comparatively broad based but small tubercles; striae somewhat regular, more or less forming an uniform line, declivital face rather gradually sloping and declivity commencing on posterior half; body length, 3.00-3.40 mm ..... *A. funereus* (Lea)
8. Smaller species, body length 2.30-2.60 mm; body comparatively slender (2.30 times as long as wide); postero-lateral margins confluent with interstria 7 ..... *A. consimilis* (Eggers)  
 – Larger species, body length 3.20-3.40 mm; body comparatively stout (2.00-2.20 times as long as wide); postero-lateral margins confluent with interstria 4 ..... *A. apicalis* (Blandford)

### 5. *Ambrosiodmus apicalis* (Blandford)

(Fig. 13)

#### 1. *Xyleborus apicalis* Blandford

1894. Blandford, *Trans. Ent. Soc. Lond.*, p. 105. *Holotype* Female in B.M. Nat. Hist. London. *Type-locality* : Japan.

#### 2. *Ambrosiodmus apicalis* (Blandford)

1992. Wood and Bright. *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 670-671.

#### 3. *Xyleborus cristatus* Hagedorn

1908. Hagedorn, *Dt. ent. Z.*, p. 377, *Syntype* : Female in IRSNB, Brussels. *Type-locality* : Kurseong, West Bengal, India.

1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 101.

1984. Saha and Maiti, *Rec. zool. Surv. India*, **81** (3 & 4) : 4.

#### 4. *Xyleborus fabricii* (nom. nov. for *Xyleborus cristatus*)

1963. Schedl, *Reichenbachia*, **2** : 217.

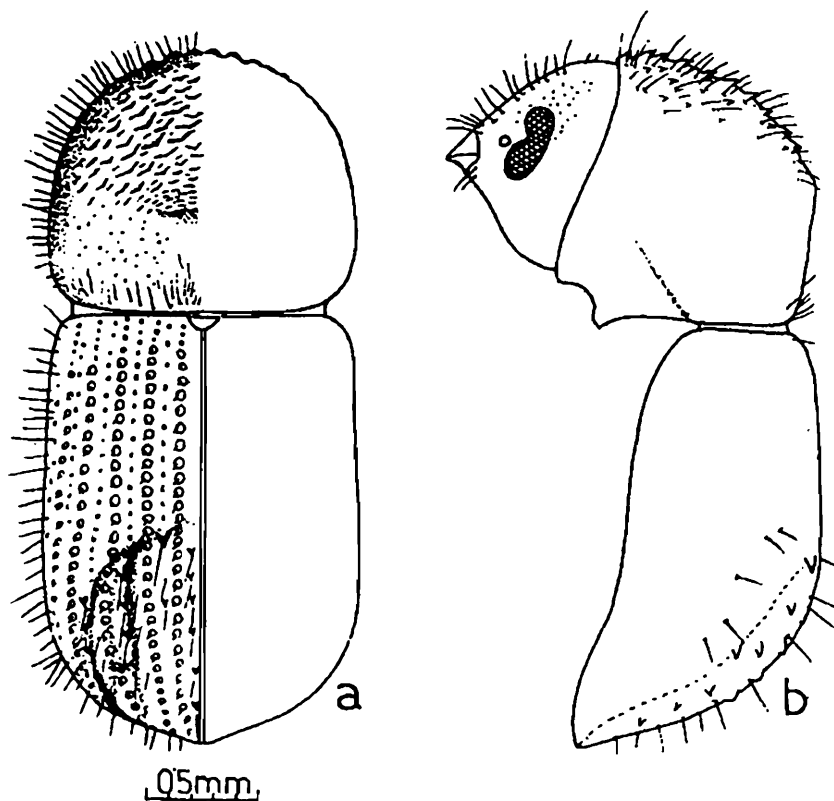
1989. Wood, *Gt. Basin Nat.*, **49** : 169 (Synonymy).

#### 5. *Kalantaneus fabricii* (Hagedorn)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 820, 821.

**Description : Female :** Body short, stout and densely hairy; head, pronotum and elytra reddish brown to pitchy black. Body length 3.20-3.40 mm, 2.0-2.2 times as long as wide.

Head ovoid; frons plano-convex with median line elevated, weakly impressed transversely above epistoma; surface finely reticulate with close shallow punctures of irregular size, becoming sparse towards vertex and with long erect hairs. Eyes elongately oval and less than half of its width emarginate. Antennal scape long and slender; club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring; truncate face with two more recurved sutures; posterior face devoid of any suture.



**Fig. 13 :** *Ambrosiodmus apicalis* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum ovoid slightly or 1.1 times as long as wide; basal and lateral sides feebly outcurved; anterior margin broadly rounded; distinct transverse summit slightly below the middle; anterior half with distinct close asperities gradually becoming less transverse and more prominent anteriorly, and anterior most row with 7-8 contiguous asperities; posterior half shiny with scattered minute punctures and indistinct asperities; surface with long erect hairs, more distinct towards basal margin.

Scutellum smooth and shiny; subtriangular with rounded apical margin.

Elytra nearly 1.5 times as long as pronotum and 1.3 times as long as its width; basal margin substraight; lateral sides subparallel on basal half, thence converging

posteriorly with broadly rounded apex; discal striae impressed and with distinct punctures, each with a microhair, striae 1 and 2 more impressed than other striae and marked by comparatively large punctures, interstriae somewhat flat, smooth and punctate with erect hairs. Declivity commencing almost at the middle, faces smooth and flatly convex; postero-lateral margins rounded; striae marked by shallow punctures, each with a microhair; interstriae 1 and 2 with some setiferous granules, granules on interstria 2 at the summit of declivity; interstria 3 somewhat raised upto half way with a few tubercles interstria 4 also weakly elevated with small granules. Procoxae contiguous; protibiae with 6 and both meso- and meta-tibiae with 8 teeth.

*Male* : Body reddish brown with posterior declivity of elytra almost blackish brown. Body length 2.7-3.0 mm, 1.5-1.8 times as long as wide; head concealed under pronotum. Pronotum subquadrate, as long as or slightly wider than long; posterior margin substraight; anterior margin broadly rounded; lateral sides subparallel upto basal two-thirds; in profile, dorsal surface convex with small asperities present anteriorly.

Elytra almost as wide as pronotum at base; basal margin substraight; lateral sides subparallel upto more than basal three-fourths, thence strongly converging to broadly rounded apex; distinctly truncate at apex, pilose; chestnut brown; 9 rows of striae at each elytron.

*Distribution* : INDIA : *Meghalaya* : Shillong. *Naga Hills*. *Sikkim* : North Sikkim, Singla, *West Bengal* : Darjiling Dist., Kurseong, Senchal Range, Lava, Lepchajagat and Rangirum. ELSEWHERE : Bhutan, Myanmar, China, Japan and Korea.

*Host* : *Alnus nepalensis*, *Quercus lamellosa* and *Symplocos theaeifolia*.

*Remarks* : The species was originally described as *Xyleborus apicalis* away back in 1894 by Blandford from Japan. It stands to day as a valid species under *Ambrosiodums* under which a number of species has been synonymised (Wood and Bright, 1992a). The species is well distributed in the hilly tracts of the north-east India infesting different host-plants (Beeson, 1930 and 1941).

## 6. *Ambrosiodmus asperatus* (Blandford)

(Fig. 14)

### 1. *Xyleborus asperatus* Blandford

1895. Blandford, *Ann. Mag. nat. Hist.*, **15** (6) : 321, *Holotype* : Female in B.M. Nat. Hist., London. *Type-locality* : Sri Lanka.

1959. Schedl, *Trans R. ent. Soc. Lond.*, **111** : 493-494.

1961. Browne, *Malay Forest Rec.*, No. 22 : 126.

1972. Browne, *Oriental Ins.*, **6** (1) : 20.

### 2. *Ambrosiodmus asperatus* (Blandford)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 671.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B) : 807*, fig 11, a-e.

### 3. *Xyleborus nepotulus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 179, *Holotype* : Female in Nat. Hist. Mus. Wien. *Type-locality* : Sumatra, Indonesia.
1959. Schedl, *Trans. R. ent. Soc. Lond.*, **111** : 493 (Synonymy).

### 4. *Xyleborus citri* Beeson

1930. Beeson, *Indian Forest Rec. (Ent.)*, **14** (10) : 215 and 229, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Tista Valley, West Bengal, India.
1989. Wood, *Gt. Basin Nat.*, **49** : 169 (Synonymy).

### 5. *Xyleborus nepotulomorphus* Eggers

1936. Eggers, *Tijdschr. Ent.*, **79** : 88, *Holotype* : Female, in Amsterdam Mus. and 1 (Female) Paratype in Nat. Hist. Mus. Wien. *Type-locality* : Java, Indonesia.
1959. Schedl, *Trans R. ent. Soc. Lond.*, **111** : 493 (Synonymy).

### 6. *Xyleborus cristatuloides* Schedl

1971. Schedl, *Ent. scand. Suppl.*, **1** : 284. *Holotype* : Female in University of Lund Collection. *Type-locality* : Sri Lanka.
1989. Wood, *Gt. Basin Nat.*, **49** : 169 (Synonymy).

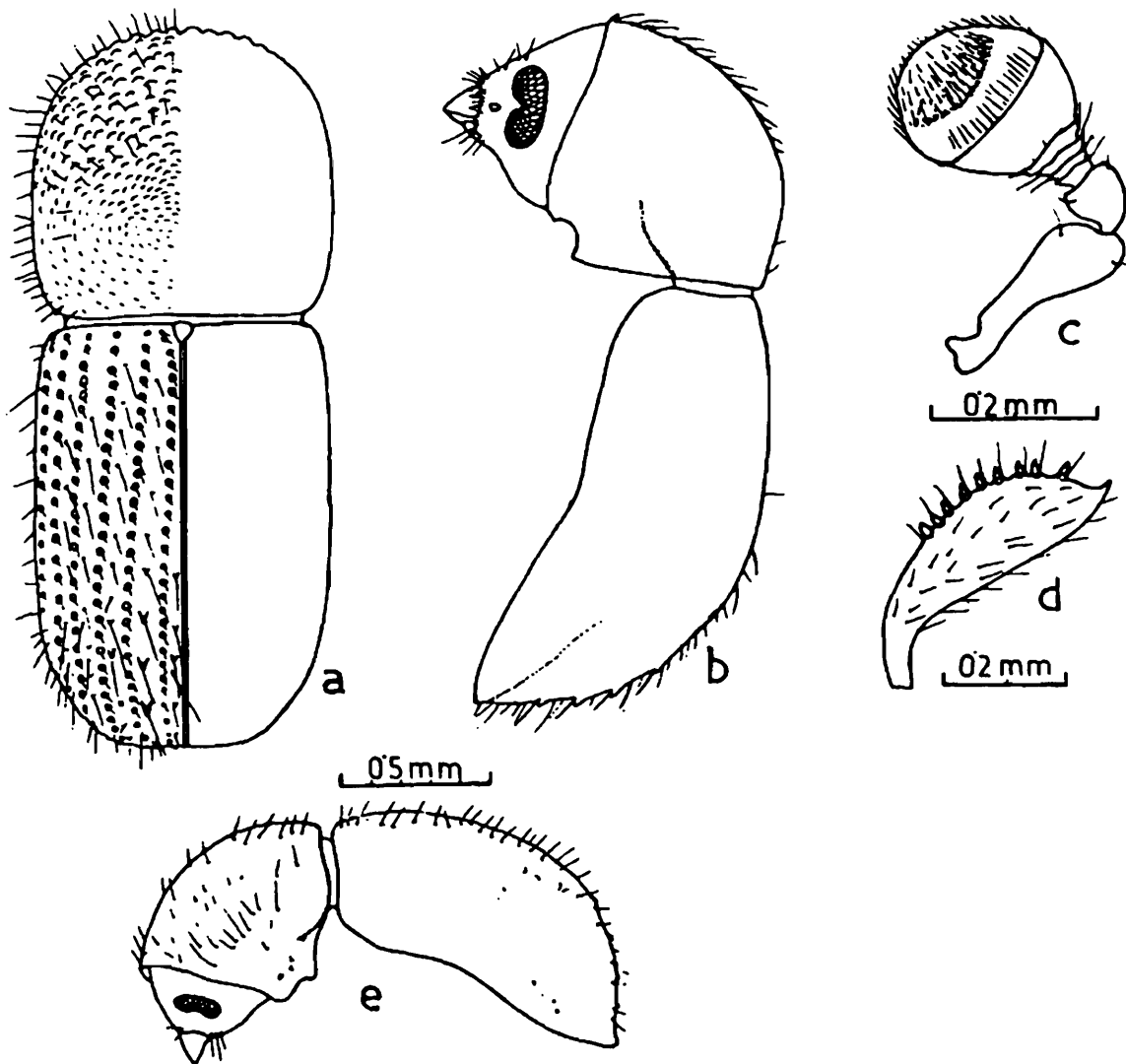
*Description* : *Female* : Body somewhat cylindrical; head, pronotum and elytra reddish brown; antennae and legs paler. Body length 2.40-2.50 mm, 2.4 times as long as wide.

Frons flatly convex, without any distinct median line, surface rugosely reticulate with irregular close punctures and sparse erect hairs. Eyes emarginate nearly one third of its width. Antennal scape stout, club obliquely truncate; on anterior face, basal corneous portion stout; on anterior face, basal corneous portion reaching upto basal one-third with substraight apical margin and segment 2 chitinized; posterior face with two distinct sutures.

Pronotum subglobose; either nearly as wide as long or slightly wider anterior margin with a few weak asperities; summit indistinct and placed nearly at the middle; asperities on anterior half transverse and distinct, weak asperities around the summit and extending nearly upto base in the form of transverse weak asperities; long hairs along anteriorly and laterally and a few finer ones posteriorly.

Scutellum tongue-shaped.

Elytra 1.4 times as long as and as wide as pronotum; lateral sides subparallel upto basal two-thirds, broadly rounded posteriorly; discal striae distinctly impressed,



**Fig. 14 :** *Ambrosiodmus asperatus* (Blandford), Female : a, Pronotum and elytra in dorsal view, b, head, pronotum and elytra in lateral view, c, antenna; d, tibia. Male : e, head, pronotum and elytra in lateral view.

punctures deep and large and each with a microhair; interstriae nearly twice as wide as striae with uniseriate minute punctures and long thin erect hairs. Declivity commencing at posterior third, face steeply convex; postero-lateral margins carinate; striae 2 and 3 outcurved at declivital face; interstria 1 along with striae slightly depressed and devoid of granules or tubercles; interstria 2 with 4 and interstria 3 with 2 distinct tubercles; other interstriae with granules and admixture of small and long hairs. Pro- and meta-tibiae with 7 and 9 teeth respectively.

*Male* : Male is very similar to female. Body much reduced; body length about 1.70 mm; yellowish in colour; frons flat with weak median elevation, surface rugosely reticulate with punctures. Pronotum strongly convex; surface smooth with indistinct punctures or asperities intermingled with thin hairs. Elytra 1.2 times as long as pronotum, strial punctures in regular rows; declivital face steep, declivital interstriae with indistinct granules; entire surface with fine hairs.

*Distribution* : INDIA : West Bengal : Darjiling Dist. : Tista Valley; Tamil Nadu : ELSEWHERE : Indonesia (Java, Sumatra, Timor Island), Malaysia, Sri Lanka and China (Xizang).

*Hosts* : *Citrus aurantium* and *Thea* sp.

*Remarks* : *Ambrosiodmus asperatus* is the current scientific name of *Xyleborus asperatus* Blandford described from Sri Lanka, with which more species have been synonymised. However, *A. asperatus* is known to be a borer of dead and dying trees in India, Sri Lanka and Malaya (Browne, 1961). It is so far known to infest living *Citrus aurantium*.

## 7. *Ambrosiodmus consimilis* (Eggers)

### 1. *Xyleborus consimilis* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 180, *Holotype* : Female deposited in Museo Civico Genova, Genova. *Type-locality* : Sumatra, Borneo, Indonesia.

1975. Schedl, *Oriental Ins.*, **9** (4) : 451.

### 2. *Ambrosiodmus consimilis* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 672.

*Description* : *Female* : Body stout and cylindrical; head pronotum and elytra deep reddish brown. Body length 2.30-2.60 mm, 2.3 times as long as wide.

Frons plano-convex, surface finely reticulate with fine granules; median line inconspicuous. Eyes and antennae as in *Ambrosiodmus*.

Pronotum nearly as long as broad, subparallel on basal half, gradually rounded with broadly rounded anterior margin and armed with weak asperities; summit just above middle; more than anterior one-third with distinct asperities, becoming smaller posteriorly; posterior half smooth and shiny with sparse distinct punctures; hairs distinct on anterior one-third and inconspicuous posteriorly.

Scutellum somewhat tongue-shaped.

Elytra 1.4 times as long as pronotum, parallel sided on basal three-fourth, gradually narrowing posteriorly; discal striae feebly impressed with distinct punctures; interstriae 2.3 times as wide as striae, with uniseriate punctures and granules towards declivity with long erect hairs. Declivity commencing behind the middle and gradually sloping; striae and interstriae 1 and 2 rather flat; striae with punctures as on disc, but with microhairs; interstriae 1 and 2 with a few uniseriate granules on and near commencement of declivity; interstria 3 feebly elevated with 3 distinct tubercles, those on interstriae 4 and 5 rather small.

*Male* : Unknown.

*Distribution* : INDIA : *Tamil Nadu* : Anamalai Hills. ELSEWHERE. Indonesia (Borneo).

*Remarks* : The species is a very distinct one in having prominent tubercles on declivital interstriae 3 and 5. It is only so far known from the high altitudes of the Anamalai Hills in the Cinchona plantation (Schedl, 1975).

### 8. *Ambrosiodmus dihingensis* (Eggers)

(Fig. 15)

#### 1. *Xyleborus rufobruneus* var. *dihingensis* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 189, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Upper Dihing Reserve, Lakhimpur, Assam, India.

#### 2. *Ambrosiodmus dihingensis* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 673.

#### 3. *Euwallacea rufobruneus* var. *dihingensis* Eggers

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 812, 818.

*Description* : *Female* : Body large and stout; head and pronotum reddish brown and elytra comparatively darker. Body length 5.40 mm, 2.3 times as long as wide.

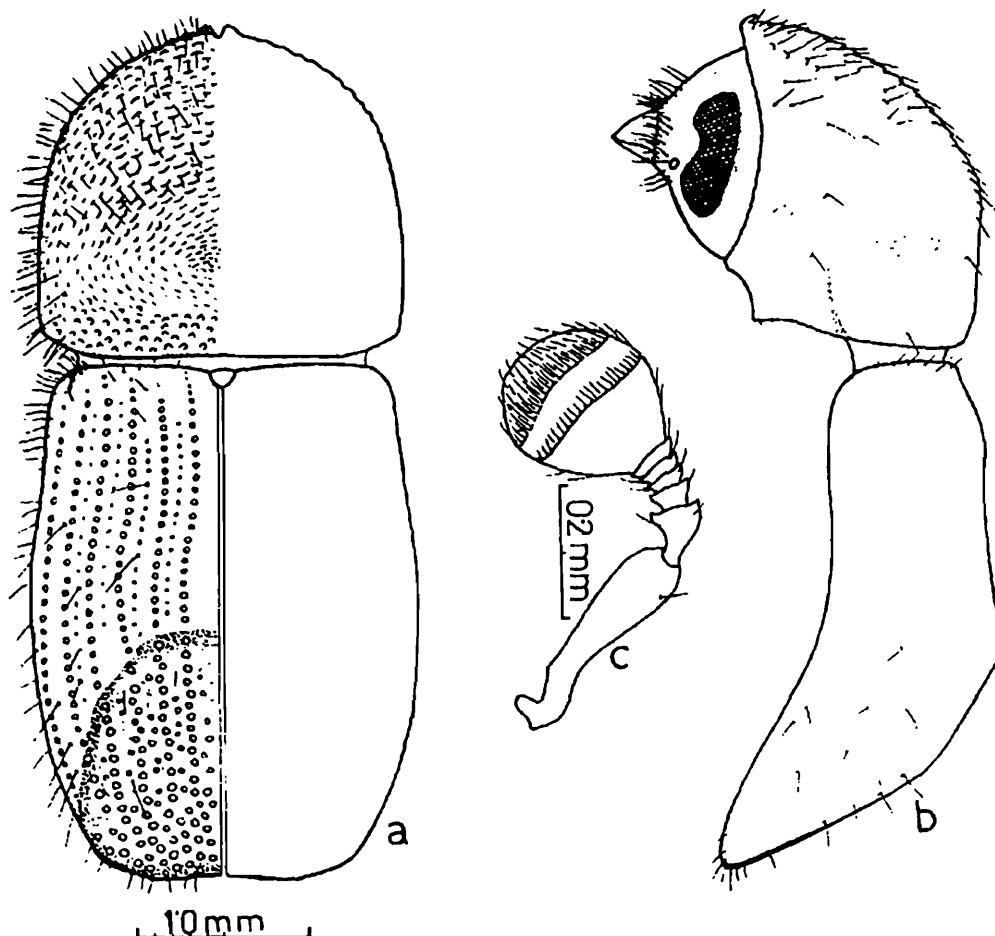
Frons plano-convex, but flattened between eyes, surface shiny with deep close punctures and erect fine hairs except smooth median area. Basal corneous portion of antennal club with substraight apical margin and segment 2 distinct; posterior face with one distinct suture, other one obscure.

Pronotum slightly wider than long; postero-lateral angles obtuse; lateral sides weakly outcurved, broadly converging anteriorly and terminating into a narrow projection accommodating a few asperities of which two very prominent and contiguous; anterior two-thirds declivous and provided with small adpestral transverse asperities in crescentic rows around distinct summit; asperities becoming larger anteriorly, elongate postero-laterally and granulate posteriorly; basal narrow strip shiny with distinct punctures; declivous portion with long erect hairs and basal third devoid of any hair.

Scutellum smooth, shiny and triangular.

Elytra about 1.6 times as long as pronotum and 1.3 times as long as its width, slightly wider than pronotum; lateral sides subparallel on basal third and slightly outcurved upto commencement of declivity thence narrowing posteriorly, postero-lateral margins angularly marked; elytral disc distinctly depressed slightly below the basal margin with a few feeble transverse wrinkles and with a distinct hump just at the commencement of declivity; striae distinct, marked by small close punctures; interstriae more wider than striae, surface uneven with irregular shallow punctures

and with a few erect hairs. Declivity commencing almost at the middle, face on upper half planoconvex and lower half rather flat; postero-lateral margins distinctly margined; striae and interstriae feebly marked on upper half, rather obsolete in lower half, surface uneven and coarse with large irregular punctures and almost devoid of any hair.



**Fig. 15** : *Ambrosiodmus dihingensis* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna.

*Male* : Unknown.

*Distribution* : INDIAN : Assam : Lakhimpur Dist., Upper Dihing Reserve; West Bengal : Darjiling Dist., Samsingh. ELSEWHERE : None.

*Host* : *Artocarpus lakoocha*, *Pterocarpus marsupium*.

*Remarks* : The variety *dihingensis* under *Xyleborus rufobruneus* remains only valid upto 1992, when Wood and Bright (1992a) in their World Catalogue raised its status as a species, *Ambrosiodmus dihingensis*. However, in the same catalogue they synonymised the species under *Xyleborus rufobruneus* Eggers which was quite confusing. Realising its close similarity with *A. lantanae*, it has been kept as *A. dihingensis*.

### 9. *Ambrosiodmus funereus* (Lea)

(Fig. 16)

#### 1. *Xyleborus funereus* Lea

1910. Lea, *Proc. R. Soc. Viet. (N.S.)*, **22** : 139, *Syntype* : Female in South Australian Museum, Adelaide. *Type-locality* : Queensland : Cairns.
1959. Kalshoven, *Tijdschar. Ent.*, **102** : 139-140.
1966. Scheld, *Entom. Abh. Mus. Tierk. Dresden.*, **35** : 55.

#### 2. *Ambrosiodmus funereus* (Lea)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 674.

#### 3. *Xyleborus nepos* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 198-199, Female and Male. *Type-locality* : Java, Indonesia.
1930. Beeson, *Indian Forest Rec. (Ent.)*, **14** (10) : 74.
1939. Schedl, *Tijdschr. Ent.*, **84** : 45 (Synonymy).

#### 4. *Ambrosiodmus nepos* (Eggers)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 59-62, Fig. 12, a and b.

#### 5. *Xyleborus nepos robustus* Schedl

1933. Schedl, *Philipp. J. Sci.*, **51** : 103, *Holotype* : Female in Nat. Hist. Mus. Wien. *Type-locality* : Luzon, Philippines.
1989. Wood, *Gt. Basin. Nat.*, **49** : 170 (Synonymy).

#### 6. *Xyleborus signatus* Schedl

1949. Schedl, *Rev. Brasil Biol.*, **9** : 278, Female. *Type-locality* : Mexico.
1975. Wood, *Gt. Basin. Nat.*, **35** (1) : 23 (Synonymy).

*Description* : *Female* : Body of medium size and somewhat cylindrical in shape; head, pronotum and elytra light brown to dark brown; antennae and legs pale brown, femur much lighter in colour. Body length 3.00-3.40 mm, 2.40 times as long as wide.

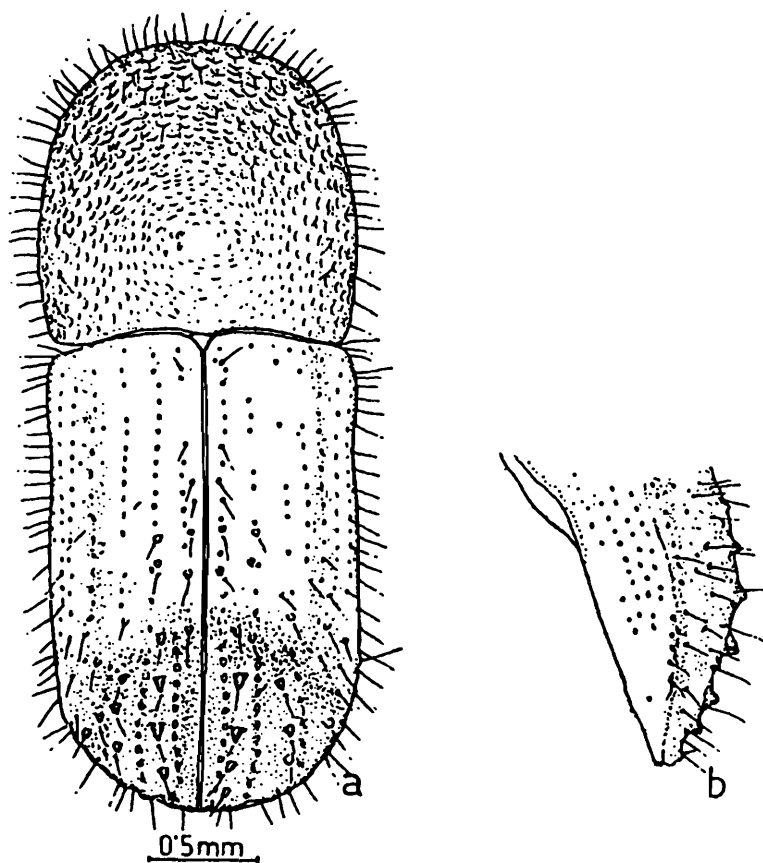
Frons flatly convex, surface with large close punctures except on a smooth elevated median area and with scattered long hairs. Eyes with weak emargination. Antennal scape elongate, club obliquely truncate; segment 1 corneous; on anterior face, basal corneous portion reduced with substraight basal margin; truncate face with segment 2 distinct, apical one indistinct; posterior face with 2 distinct sutures.

Pronotum subquadrate, either nearly as long as wide or slightly wider, asperities on anterior half transverse and distinct, weak asperities around the summit and

extending nearly upto base in the form of weak granules; long erect hairs at anterior half and laterally.

Scutellum triangular, small and shiny.

Elytra 1.45-1.50 times as long as pronotum and 1.56-1.60 times as long as its width; basal margin substraight, lateral sides subparallel upto basal two-thirds; apical margin broadly rounded; postero-lateral margins acute marked with granules; discal striae feebly impressed with uniseriate distinct shallow punctures devoid of any microhair; interstriae planoconvex nearly twice as wide as striae, with sparse shallow punctures and scattered hairs; declivital face gradually sloping, commencing slightly behind middle; strial punctures as on disc; interstria 1 having a few sparse granules at the base of declivity, all other declivital interstriae upto 6 with sparse small and large setaeferous granules in rows, those on interstriae 2 and 3 rather large and tuberculate. Protibiae with 9 and meso- and meta-tibiae with 10 teeth.



**Fig. 16** : *Ambrosiodmus funereus* (Lea), Female : a, Pronotum and elytra in dorsal view; b, elytra in lateral view.

*Male* : Male not available for study.

*Distribution* : INDIA : *Andaman and Nicobar Islands* : Middle Andaman; South Andaman : Rut land island and Kumio; *Nicobar Islands* : Kamorta. ELSEWHERE : Indonesia (Java, Sumatra and Celebes), Philippines, New Guinea, Mexico and Australia.

*Hosts* : *Ficus infectoria* and *Sterculia alata*.

*Remarks* : The species is so far known only from the Bay Islands. The population found in the Middle Andaman shows some variations as regards to its size and shape of declivital tubercles, striae punctures, body colour, etc. (Maiti and Saha, 1986). It is considered as a deep sapwood borer as evidenced from a single collection made at a depth of 6 cm within the sapwood of the host-plant.

### 10. *Ambrosiodmus lantanae* (Eggers)

(Fig. 17)

#### 1. *Xyleborus lantanae* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, **14** (10) : 4-5, *Holotype* : Female in F.R.I., Dehra Dun.  
*Type-locality* : Sagar, Karnataka, India.

1977. Kumar and Chandra, *Oriental Ins.*, **11**(1) : 44.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 127-128, Fig. 34, a and b.

#### 2. *Ambrosiodmus lantanae* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 675.

#### 3. *Euwallacea lantanae* (Eggers)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 812, 816 and 817.

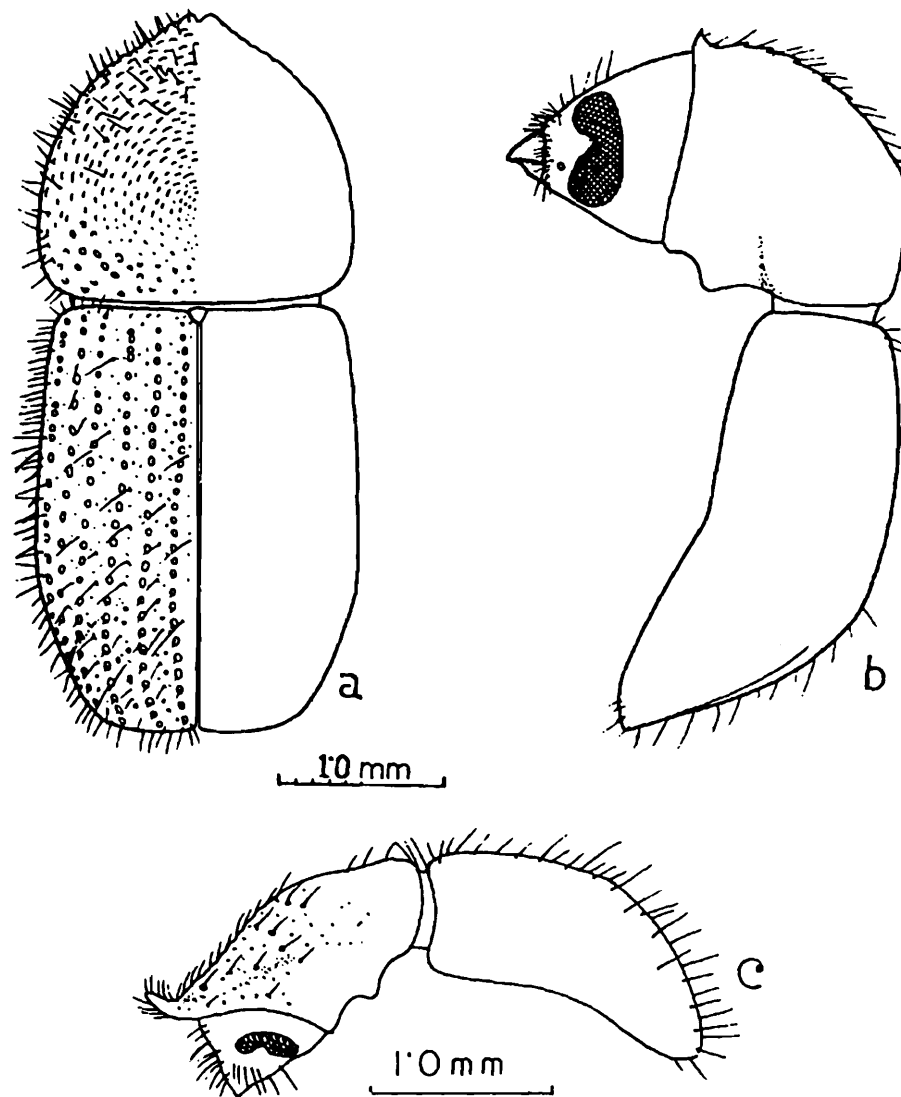
*Description* : *Female* : Body stout and fairly large; head, pronotum and elytra chestnut brown; antennae and legs slightly paler. Body length 4.00-4.15 mm, 2.1 times as long as its width.

Frons weakly depressed at the upper level of eyes and just above the epistomal margin, intervening area fairly swollen, smooth and shiny; surface weakly rugose with deep punctures and thin whitish hairs. Basal corneous portion of antennal club with substraight apical margin; truncate face with segment 2 distinct and chitinized; posterior face with one distinct suture, other one obscure.

Pronotum nearly as long as broad; postero-lateral angles obtuse; lateral sides weakly outcurved and gradually converging anteriorly and terminating into a narrow projection accommodating a few asperities, of which middle two prominent and contiguous; summit at posterior third; declivous portion convex and stiff with distinct asperities in crescentic rows around summit; asperities becoming larger anteriorly, elongate postero-laterally and granulate posteriorly; a few small punctures along the basal margin; anterior declivous portion fairly densely hairy.

Scutellum smooth, shiny and distinctly triangular.

Elytra about 1.3 times as long as wide and as wide as pronotum, lateral sides subparallel upto basal two-thirds, thence feebly narrowing posteriorly, disc uniformly



**Fig. 17** : *Ambrosiodmus lantanae* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view. Male : c, head, pronotum and elytra in lateral view.

convex, striae very distinct with small and close punctures, devoid of any microhair; interstriae flat, much wider than striae with one or two irregular rows of small and shallow punctures having long erect and sparse irregular hairs. Declivity commencing slightly below the middle, declivital face plano-convex on anterior half and steep on posterior half; postero-lateral sides somewhat margined; striae distinctly marked by large, distinct punctures upto apex and each with a microhair; interstriae more flat with comparatively large punctures and sparse hairs. Protibiae abruptly cut apically with 7 teeth, both meso- and meta-tibiae with 9 teeth.

*Male* : Body short and somewhat different from that of female; head and elytra yellowish brown, pronotum reddish brown, but still darker apex of pronotum and elytra. Body smaller, length 3.30 mm. Head conceal under projection of anterior portion of pronotum, frons planoconvex, shining with scattered minute punctures and fine hairs. Eyes and antennae as in female.

Pronotum highly deformed, slightly wider than long and widest at the base, thence gradually narrowing anteriorly, anterior part fairly projected with two distinct broadly rounded projections; antero-lateral sides below the projections with short sharp margins; basal fourth convex, thence gradually sloping anteriorly; anterior half medially much depressed with somewhat dense granules on shiny surface with spars minute hairs; excavated margin along the lateral sides with weak asperities and comparatively long hairs; basal third with irregular shallow punctures.

Scutellum somewhat submerged, triangular, smooth and shiny.

Elytra nearly as long as broad and 1.1 times as long as pronotum; lateral sides weakly outcurved and apex narrowly rounded; declivity commencing slightly above the middle; face somewhat steeply sloping; striae very distinct throughout, but somewhat confused towards apex, punctures devoid of any microhair; interstriae with irregular punctures and uniseriate with long erect hairs.

*Distribution* : INDIA : Karnataka : Sagar; Nicobar Island : Little Nicobar; West Bengal : Darjiling Dist., : Kalimpong, Dahura, Lopchu and Samsingh; Jalpaiguri Dist. : Gazaduba. ELSEWHERE : Myanmar.

*Hosts* : *Albizia lebbek*; *Anthocephalus cadamba*; *Anogeissus acuminata*, *Gmelina arborea*, *Magnifera indica*, *Michelia champaca*, *Lantana* sp.

*Remarks* : The species is close to *A. dihingensis*, but it can be differentiated by its smaller size, substraight elytral disc, and striae and interstriae on declivital face distinctly marked upto apex. The species is known as a wing borer marking circumferential galleries or bifurcate tunnels in the horizontal plane of the entrance hole (Beeson, 1930 and 1941).

~~11.~~ ***Ambrosiodmus lewisi*** (Blandford)  
(Fig. 18)

1. ***Xyleborus lewisi*** Blandford

1894. Blandford, *Trans. ent. Soc. Long.*, p. 104. Syntype : 9 Females in *B.M. Nat. Hist.*, London. Paratype, 1 Female in *Nat. Hist. Mus. Wien*. *Type-locality* : Hakono, Miyanoshta, Japan.

1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 106.

1961. Brown, *Malay Forest Res.*, No. 22, p. 109.

2. ***Ambrosiodmus lewisi*** (Blandford)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 675-676.

1975. Schedl, *Oriental Ins.*, **9** (4) : 450.

3. ***Xyleborus tegalensis*** Eggers

1923. Eggers, *Zool Meded.*, **7** : 181 Syntype : 3 Females; 1 Syntype in RNH, Leiden, 1 in SMTD, Dresden, and 1 in Eggers Coll. in NHMW, Wien.

1950. Schedl, *Ann. Mag. nat. Hist.*, 3 (2) : 894 (Synonymy).

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 676.

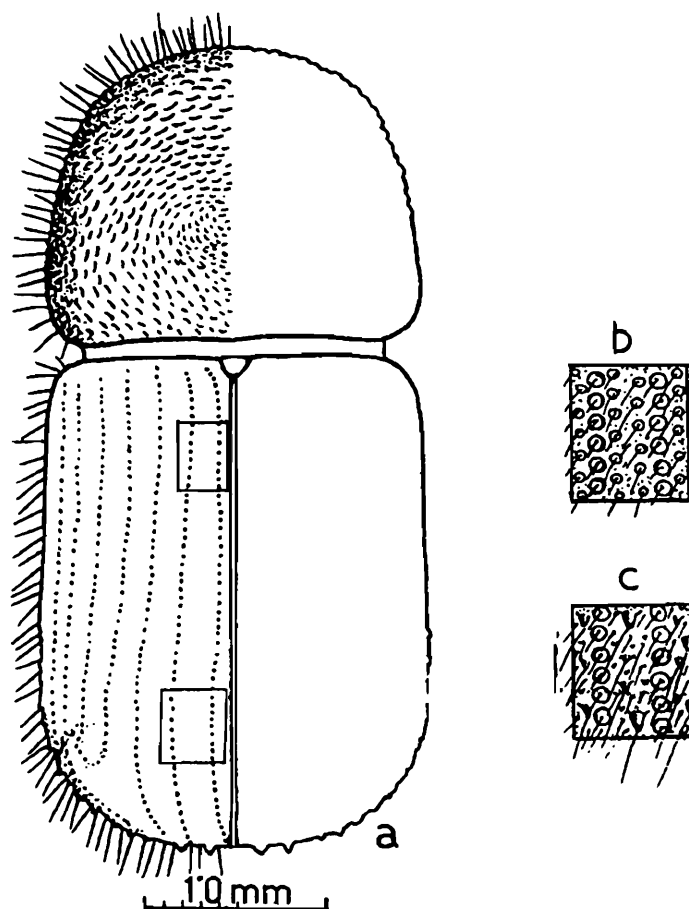
#### 4. *Xyleborus lewekianus* Eggers

1923. Eggers, *Zool. Meded.*, 7 : 181, *Holotype* : Female in Hamburg Mus.

1989. *Gt. Basin Nat.*, 49 : 170 (Synonymy).

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 676.

*Description : Female* : Body short, stout and densely hairy; head, pronotum and elytra yellowish brown to reddish brown, sometimes elytra comparatively darker. Body length, 4.45-4.60 mm, 2.1 times as long as wide.



**Fig. 18** : *Ambrosiodmus lewisi* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity.

Frons flatly convex, and transversely and distinctly depressed at the level of upper margin of eyes, transverse area above epistomal margin somewhat swollen and smooth, but with deep punctures; surface roughened with deep close punctures on either side of median line and with long fairly dense hairs. Eyes nearly half of its width emarginate. Antennal club obliquely truncate; on anterior face, basal corneous portion with recurved apical margin, segment 2 chitinized; posterior face unmarked by any suture.

Pronotum subquadrate, 1.2 times as wide as long; anterior margin unarmed; summit distinct and placed nearly at the middle; entire pronotal surface provided with weak but distinct asperities, decreasing in size posteriorly and laterally, arranged crescentically around the summit and densely clothed with long yellowish erect hairs.

Scutellum tongue shaped and shiny.

Elytra subquadrate, about 1.7 times as long as pronotum and 1.3 times as long as its width; lateral sides subparallel upto basal one-fifth, postero-lateral margins with coarse distinct granules in rows; discal striae marked by single row of irregular but distinct punctures, each with a microhair; interstriae flat, shiny, nearly thrice as wide as striae, with irregular rows of shallow small punctures, granulate towards declivity and with long erect hairs. Transition between declivity and disc not well marked, declivital slope rather gradually, face convex and more hairy, striae 1 and 2 feebly impressed, punctures distinct, closer than on disc and each with distinct microhairs; all the interstriae with irregular row of either tubercles or granules, tubercles those on interstriae 2, 3 and sometimes also 4 comparatively large. Protibiae with 8, meso- and meta-tibiae with 11-12 teeth.

*Male* : Male completely different from female, body reduced; in profile, pronotum and elytra strongly convex; head, pronotum and elytra yellowish to pale brown; frons and pronotum moderately and elytra yellowish to pale brown; frons and pronotum moderately and elytra densely hairy. Body length, 2.80-3.00 mm.

Frons roughened with minute granules and shallow punctures with an indistinct median line, eyes and antennae as in female.

Pronotum somewhat round with substraight anterior margin, slightly wider than long, devoid of any distinct summit; surface strongly convex with scattered asperities, reduced in size, becoming more reduced posteriorly appearing as granules.

Elytra 1.7-1.8 times as long as pronotum and slightly longer than broad, very much arched; basal margin substraight; lateral sides strongly outcurved above the middle; surface roughened with granules becoming more prominent towards apex; striae feebly developed marked by shallow punctures; interstriae with irregular granules, more distinct towards declivity; transition between disc and declivity hardly marked; posterior two-thirds sloping steeply.

*Host* : *Acrocarpus fraxinifolius*, *Amoora wallichii*, *Cinnamomum obtusifolium*, *Machilus* sp., *Phoebe lanceolata* and *Terminalia myriocarpa*.

*Distribution* : INDIA : Assam : Sibsagar, Nambor Reserve; Lakhimpur, Upper Dihing Reserve. Tamil Nadu : Anaimalai hills. West Bengal : Darjiling Dist., : Samsingh. ELSEWHERE : Indonesia (Borneo, Java and Sumatra), Korea, Taiwan and Japan.

*Remarks* : *Xyleborus lewisi*, a species originally described from Japan, is quite well known in the Orient including India and has been transferred here to the genus

*Ambrosiodmus*. Biological information is limited to the record of some hosts in India, especially attacking *Cinchona* plants in the southern India.

12. *Ambrosiodmus minor* (Stebbing)  
(Fig. 19)

1. *Phloeosinus minor* Stebbing

1930. Stebbing, *Indian Forest Bull*, 11 : 37, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Goalpara Sal Forest, Assam, India.  
1909. Stebbing, *Indian Forest Mem. (Zool)*, 1 (2) : 20.

2. *Dryocoetes minor* (Stebbing)

1914. Stebbing, *Indian Forest Insects (Coleopt.)*, 549 p.  
1930. Beeson, *Indian Forest Rec. (Ent.)* 11 (10) : 246 (Synonymy).

3. *Xyleborus minor* Stebbing

1930. Beeson, *Indian Forest Rec. (Ent.)* 11 (10) : 246-249.  
1973. Scheld, *Ent. Blatt.*, 69 (3) : 213.  
1975. Scheld, *Ent. Basil*, 1 : 383.  
1975. Beaver and Browne, *Oriental Ins.*, 9 (3) : 298-299.

4. *Ambrosiodmus minor* (Stebbing)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 676.  
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 807-808.

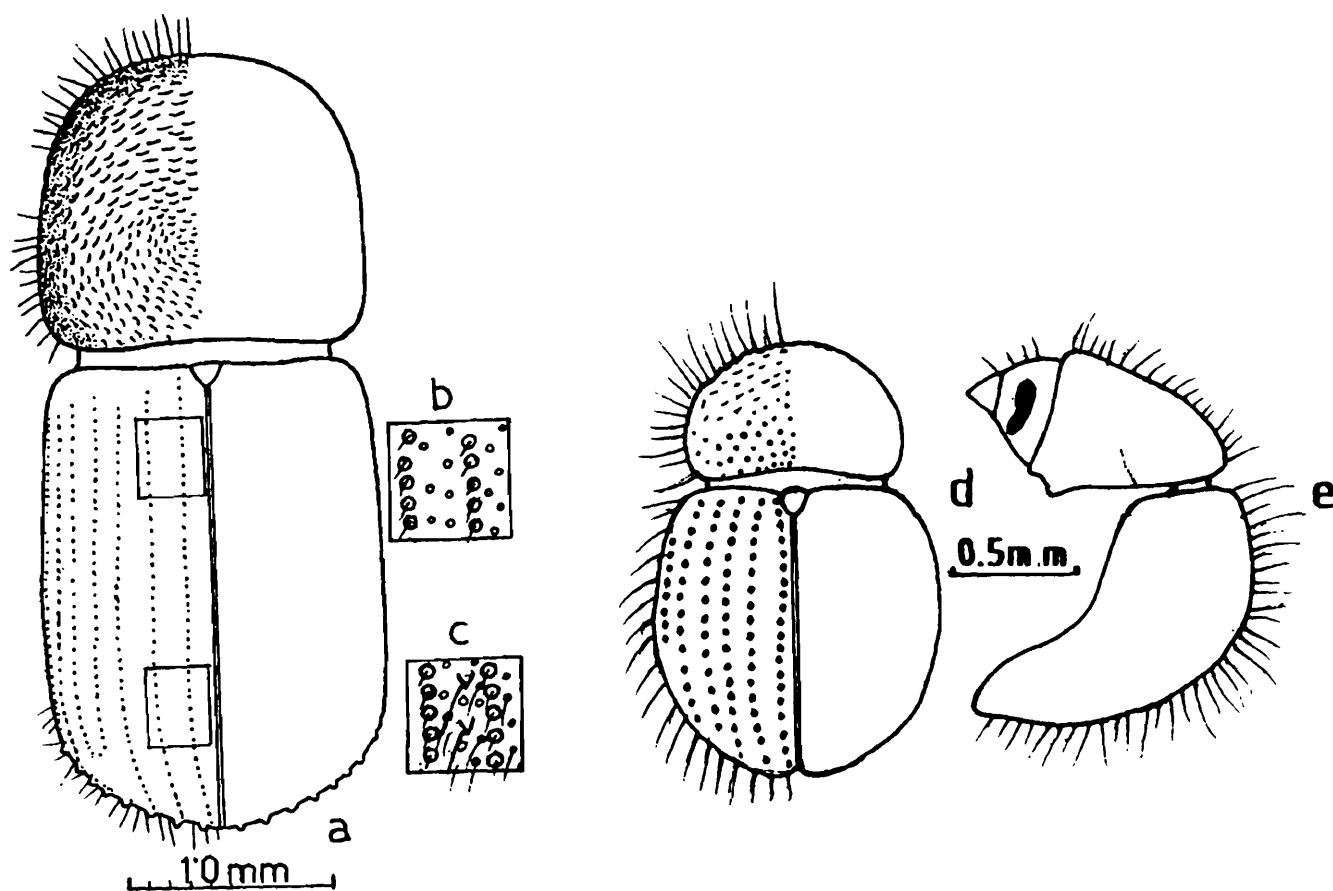
*Description : Female* : Body short, stout and densely hairy; reddish brown in colour. Body length 3.70-3.90 mm, 2.2 times as long as wide.

Frons flatly convex, with indistinct median line, surface rugose with irregular punctures and sparse erect hairs. Eyes as in *A. lewisi*. Antennal scape long antennal club. Obliquely truncate, on anterior face, basal corneous portion with recurved apical margin forming a complete ring; segment 2 conspicuous; posterior face with one suture apically.

Pronotum as in *A. lewisi*.

Scutellum large and tongue-shaped.

Elytra 1.57-1.70 times as long as pronotum, 1.32-1.45 times as long as its width; lateral sides subparallel upto posterior one-fifth; postero-lateral margins confluent with interstria 7 and with distinct coarse granules; disc rather convex, striae marked by somewhat distinct irregularly uniseriate punctures, each with a microhair; interstriae more than twice as wide as striae, surface flat with 1-2 irregular rows of



**Fig. 19 :** *Ambrosiodmus minor* (Stebbing), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity. Male : d, pronotum and elytra in dorsal view; e, head, pronotum and elytra in lateral view.

shallow punctures, granulate towards declivity and with long erect hairs. Declivital slop continuous; face flatly convex; striae with more close and distinct punctures; interstriae flat either with tubercles or granules; those on interstriae 2 and 3 rather large; hairs on declivital face longer than those on disc. Procoxae contiguous, pro- and meta-tibiae with 8 and 11 teeth respectively.

*Male* : Male is similar to that of *A. lewisi* (Blandford), except in the following characters, such as, frons devoid of any median line but with a weak depressed area. Pronotum less arched. Elytra with well marked striae; interstriae devoid of any granules and declivital face more steep.

*Distribution* : INDIA : Assam : Goalpara. Meghalaya : Shillong Madhya Pradesh : North Sihawa Range, Raipur; Raighar Range, Balaghat. Maharashtra : Surat, Dangs. Uttar Pradesh : Dehra Dun, Pathri, Saharanpur, Sarju Valley, Mumaon, Haldwani, Ranikhet and Gorakhpur. West Bengal : Jalpaiguri Dist., Tondu Range, Buxa, Kuntimari, Raidhak and Rajabhatkhawa. ELSEWHERE : Bangladesh, Myanmar, Thailand and Vietnam.

*Hosts* : *Albizia procera*, *Mallotus philippinensis*, *Odina wodier*, *Pterospermum acerifolium*, *Shorea robusta*, *Tectona grandis*, *Terminalia tomentosa*.

*Remarks* : *A. minor* is a close species to *A. lewisi* Blandford, except in having smaller body from and roughened frons with dense close punctures. Beeson (1930) studied in details the biology of the species both in insectory as well as in the field. The species is predominantly gregarious. *Shorea robusta* is the most preferred host, particularly to the timber of a weak dead wood or already invaded by fungi. The adults emerge maximum in number during the month of May as recorded in captivity at Dehra Dun. The development cycle of a community is normally one year (Beeson, 1941).

### 13. *Ambrosiodmus sundaensis* (Eggers)

(Fig. 20)

#### 1. *Xyleborus sundaensis* Eggers

1923. Eggers, *Zool. Meded.*, 7 : 175, 2 Females and 1 Male in collection of Hagedorn and Eggers; *Type-locality* : Indonesia, Java.

1961. Browne, *Malay Forest Rec.*, No. 22 p. 107.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 142-144.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 778.

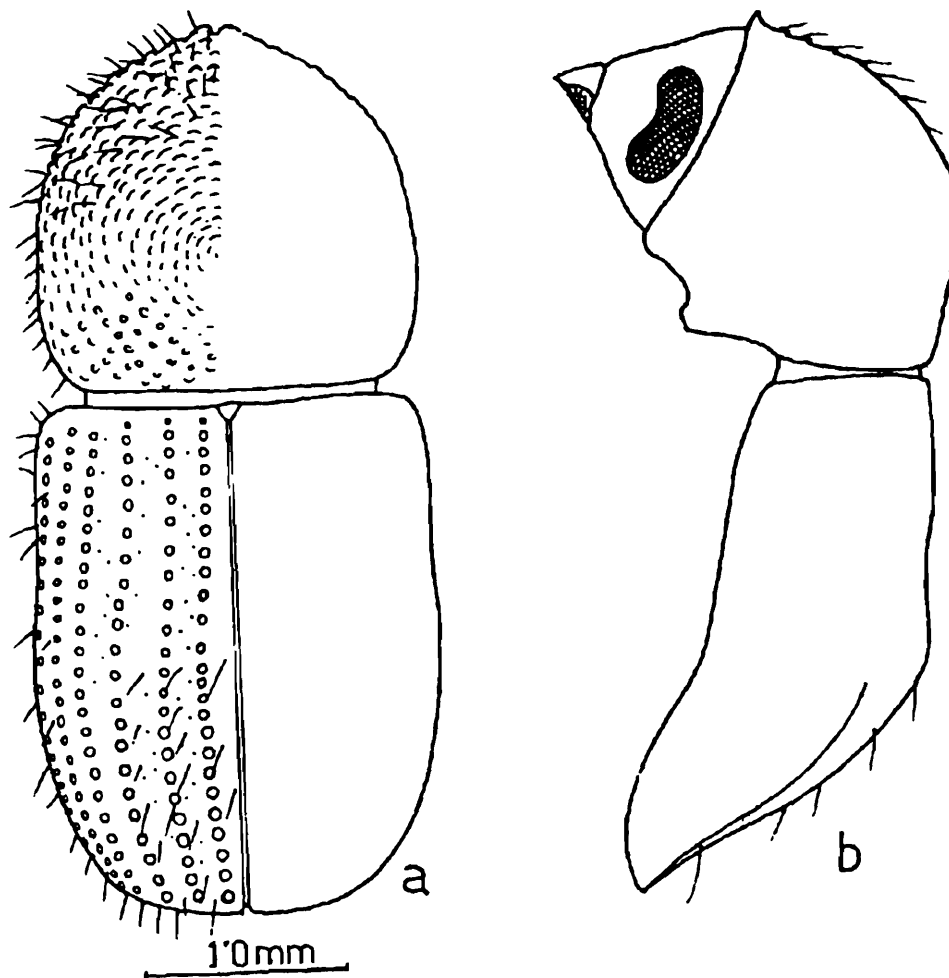
*Description* : *Female* : Body fairly large and stout; head, pronotum and elytra chestnut brown to blackish brown; elytral declivity slightly darker; antennae and legs light brown. Body length 4.00-4.30 mm, 2.26 times as long as wide.

Frons weakly convex with deep irregular large punctures and with scattered thin hairs; weakly depressed just above epistoma as well as slightly below vertex. Antennal scape comparatively thin and short; club obliquely truncate; segment 1 corneous; on anterior face basal corneous portion with substraight apical margin; truncate face with segment 2 very distinct and chitinized; posterior face with two sutures.

Elytra about 1.4 times as long as and nearly as wide as pronotum and 1.3 times as long as its width; lateral sides subparallel; on basal third whence slightly outcurved upto commencement of declivity, then narrowing posteriorly with very broadly rounded apex; disc slightly below the basal margin distinctly depressed with a few feeble transverse wrinkles and a weak hump just at a commencement of declivity; striae distinctly marked by small close punctures without any microhair; interstriae flat and shiny, much wider than striae with a row of shallow puncture, without any distinct hair. Declivity commencing almost at the middle, face plano-convex with oblique slop; postero-lateral margins somewhat margined; anterior half of declivity with striae and interstriae as in disc and apically obsolete and with irregular comparatively large punctures, declivital periphery with a few long erect hairs. Procoxae contiguous; protibia with 7 teeth and meso- and meta-tibiae with 10-12 teeth.

*Male* : Unknown.

*Distribution* : INDIA : *Nicobar Islands* : Nancowery. ELSEWHERE : Indonesia (Java) and Malaysia.



**Fig. 20** : *Ambrosiodmus sundaensis* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

*Remarks* : The species remained under the genus *Xyleborus*, since its first description from the Malayan Archipelago by Eggers (1923). Recently, it has been recorded from Nancowry and transferred to the genus *Euwallacea* (Maiti and Saha, 1986). But Wood and Bright (1992) treated the species under *Xyleborus* which had been denied here in the present study. Instead, it had been transferred to *Ambrosiodmus* in present study owing to close resemblance with *A. lantanae* and *A. dihingensis*. It is a very uncommon species in the Orient and still unknown from the Indian mainland.

### Genus : *Arixyleborus* Hopkins

#### 1. *Arixyleborus* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 10 and 59.

1955. Browne, *Sarawak. Mus. J.*, **6** : 350.

1958. Schedl, *Tijdschr. Ent.*, **101** : 143.

1959. Schedl, *Trans. Roy. ent. Soc. Lond.*, **111** : 491.

1961. Browne, *Malay. Forest Rec.*, No. 22, p. 178.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 43.
- 1978 Wood, *Annl. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.
1978. Nobuchi, *Bull. For. & For. Prod. Res. Inst.*, No. 301 : 2 and 7.
1980. Wood, *Gt. Basin. Nat.*, **40** (1) : 96.
- 1987a. Maiti and Saha, *Bull. zool. Surv. India*, **8** (1-3) : 3.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 665.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 809.

## 2. *Xyleboricus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 212-213.
1936. Schedl, *Philipp. J. Sci.*, **60** : 59-67.
1963. Browne, *Ent. Ber.*, **23** : 55.
1952. Schedl,

*Type of genera* : (i) *Arixyleborus* : *A. rugosipes* Hopkins and (ii) *Xyleboricus* : *X. canaliculatus* Eggers.

The genus *Arixyleborus* was first erected by Hopkins (1915) based on *A. rugosipes* described by him from the Philippines. Since then many species had been transferred to this genus from other genera, namely, *Xyleborus* Eichhoff, *Xyleboricus* Eggers and *Webbia* Hopkins. It is predominantly an Oriental genus with only a few species extending upto Japan and New Guinea. The genus is represented by seven species from India. But due to non-availability of material, the species, namely, *A. canaliculatus* (Eggers), *A. granifer* (Eichhoff) and *A. granulifer* (Eggers) are not included here.

### General characters of the genus *Arixyleborus* Hopkins...

*Female* : Body short and stout to long and cylindrical; colour yellowish brown to blackish brown. Body length 1.70-2.70 mm, 2.5-2.9 times as long as wide.

Head globose, front flatly to moderately convex, surface reticulate with a few scattered punctures, fairly granulate above the epistomal margin; median line either distinctly or indistinctly marked. Eyes elongately oval, either one third or half of its width emarginate. Antennae short and stout; funicle with 5 segments, club obliquely truncate with segment 1 corneous with costate margin forming a complete ring, suture 2 incomplete, sometimes not visible; posterior face unmarked by any suture.

Pronotum as long as or longer than broad; basal margin substraight or bisinuate, lateral sides subparallel on basal two thirds, anterior margin narrowly or broadly rounded; anteriorly with distinct asperities and long hairs, posteriorly with sparse shallow punctures and with or without hairs.

Scutellum shiny and subround or tongue-shape.

Elytra longer than pronotum; lateral sides subparallel on basal two-thirds with angularly or broadly rounded apex; postero-lateral margin with or without carinae, sometimes marked by granules and confluent with interstria 9; declivity either abrupt or gradual with flat or weakly convex face; elytra disc either smooth and shining or coarse and opaque with granules and tubercles; interstriae either weakly convex or ridged with uniseriate or multiseriate granules of minute and large size, interstitial ridge on the declivity sometimes obsolete almost at the middle, striae either shallowly or deeply marked by punctures, punctures reticulately sculptured within (except *A. moestus*), with or without any microhair.

Procoxae contiguous, femur moderately long and slender, protibiae having teeth at the anterior margin, posterior surface inflated with distinct tubercles; meso- and meta-tibiae dilated at middle with 6-7 marginal teeth; tarsi 5-jointed, 4th small and emarginate.

#### Key to the species of *Arixyleborus* Hopkins based on females

1. Interstriae with multiseriate blunt granules (except, a narrow basal strip on elytral disc); both striae and interstriae somewhat obsolete on declivital face with confused irregular granules throughout; frons with a very distinct median line; body length 2.60 mm ..... *A. moestus* (Eggers)
- Interstriae with uniseriate granules (except, either narrow or broad basal strip of elytral disc); both striae and interstriae well marked on declivital face; frons without any distinct median line ..... 2
2. Interstitial ridges on elytral disc commencing much above the commencement of declivity and distinct throughout; postero-lateral margins of declivity devoid of distinct carinae, rather marked with granules; body length 1.70-1.75 .....  
..... *A. medius* (Eggers)
- Interstitial ridges on elytral disc commencing little above the commencement of declivity and distinct either throughout or upto the middle of declivity; postero-lateral margins of declivity with distinct carinae ..... 3
3. Body stout and cylindrical, 2.5 times as long as wide; anterior margin of pronotum with distinct asperities; postero-lateral margins of declivity with distinct carinae, devoid of any granule; body length 2.10-2.15 mm ..... *A. malayansis* (Schedl)
- Body long and cylindrical, nearly thrice as long as wide; anterior margin of pronotum with indistinct asperities; postero-lateral margins of declivity not distinctly carinate but marked with granules; smaller species, body length 1.80-2.00 mm ..... *A. mediosectus* (Eggers)

14. *Arixyleborus malayansis* (Schedl)  
(Fig. 21)

1. *Xyleboricus malayansis* Schedl

1936. Schedl, *Philipp. J. Sci.*, **60** (1) : 64 (*nom. nud.*).

1954. Schedl, *Philipp. J. Sci.*, **83** 150, *Holotype* Male in Nat. Hist. Mus. Wien. *Lectotype* and *Paratype* in same Mus.

2. *Arixyleborus malayansis* (Schedl)

1958. Schedl, *Tijdschr. Ent.*, **101** : 145, *Female*.

1959. Schedl, *Oriental Ins.*, **3** (1) : 52.

1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 582.

1987a. Maiti and Saha, *Bull. Zool. Surv. India*, **8** (1-3) : 6-8.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 667.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 809.

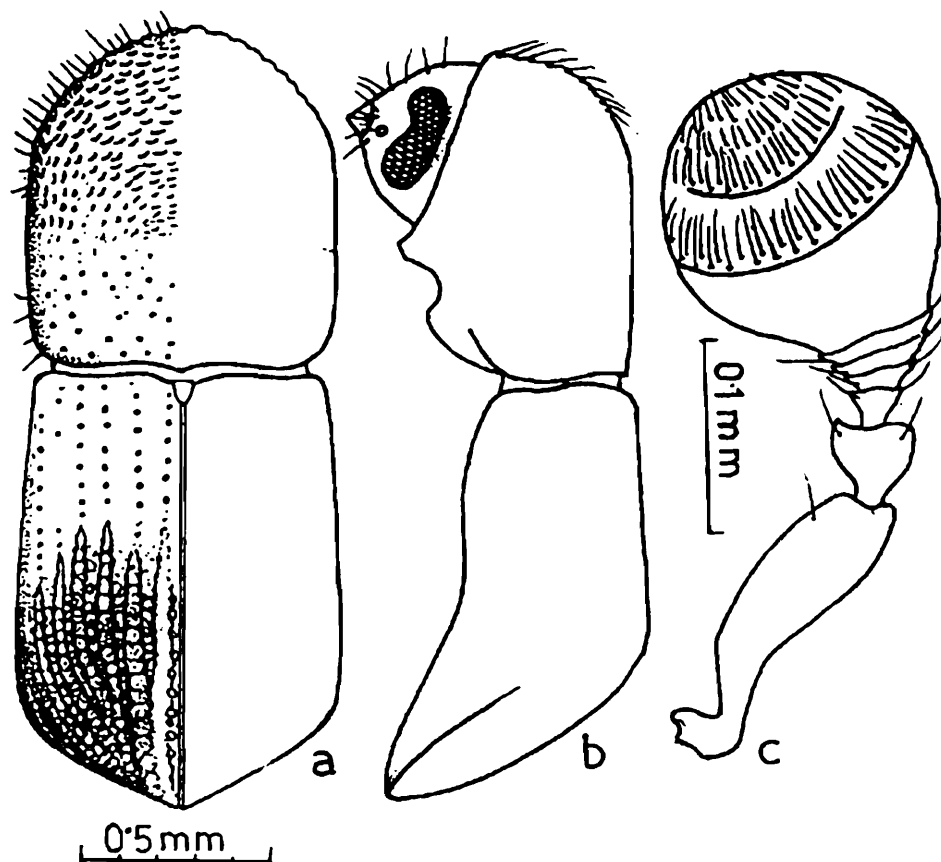
*Description : Female* : Body stout and cylindrical; head, pronotum and elytra blackish brown with legs and antennae yellowish brown in colour. Body length 2.10-2.15 mm, 2.5 times as long as wide.

Frons weakly convex, surface reticulate with a few scattered punctures and hairs, and without any distinct median line; a few scattered granules above the epistomal margin.

Pronotum subrectangular, 1.18 times as long as wide; basal margin weakly bisinuate on either side of median portion, sides subparallel upto anterior one-third, whence weakly narrowing anteriorly and terminating into angularly rounded apex with a few distinct asperities (6 or so), less than anterior half with asperities, gradually increasing in size anteriorly and with a few scattered hairs; posterior half finely reticulate with minute punctures.

Scutellum subrounded and shiny.

Elytra slightly longer than and as wide as pronotum, and 1.38 times as long as its width; basal margin weakly incurved at the middle of each elytron, lateral sides subparallel upto basal two-thirds, whence narrowing posteriorly and terminating into an angular apex; postero-lateral margins with distinct carinae; elytral basal third smooth and shiny, striae marked by minute and shallow punctures; interstriae flat with indistinct punctures; interstriae on apical two-thirds somewhat ridged, gradually becoming narrow within declivity and marked by uniseriate granules; striae in the area just before the commencement of declivity rather impressed and marked by large close punctures, reticulately sculptured within; striae 1, 2, 3 and 6 extending upto apical margin, while striae 4 and 5 terminating almost at the middle of declivity;



**Fig. 21 :** *Arixyleborus malayansis* (Schedl), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna.

interstriae 2, 4 and 5 terminating at the middle of declivity and other almost reaching to the apical margin; interstriae with setaeferous granules; dense hairs towards apical portion of sutural interstriae. Declivity steep, commencing at apical third, face convex; sutural interstriae raised a little below the middle of declivity.

*Male* : Not available for study.

*Distribution* : INDIA : *Assam* : Sibsagar, Central Range; *West Bengal* : Darjiling Dist., Dehura, Bagdogra. ELSEWHERE : Indonesia (Java and Sumatra), Malaysia, Sri Lanka and Vietnam.

*Host* : *Machilus* sp., *Vatica lanceaefolia*.

*Remarks* : The species, *Arixyleborus malayansis* can easily be distinguished from all other Indian species of the genus in having strongly ridged interstriae with distinct uniseriate granules and prominent asperities on the anterior margin of pronotum, striae are much impressed and marked by distinct large punctures which are reticulately sculptured within.

The information on the biology of the species is limited to the numerous records of hosts in Malaya and Indonesia (Browne, 1961). It was known so far from Assam in India infesting *Vatica lanceaefolia* (Schedl, 1969). In the terai plains of north Bengal, it has been recorded from *Machilus* sp. (Saha and Maiti, 1996).

15. *Arixyleborus mediosectus* (Eggers)  
(Fig. 22)

1. *Xyleboricus mediosectus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 215, *Holotype* : Female in Leyden Mus. *Type-locality* : Sinabang, Simalur Island (South Sumatra).  
1936. Schedl, *Philipp. J. Sci.*, **60** : 64.

2. *Arixyleborus mediosectus* (Eggers)

1958. Schedl, *Tijdschr. Ent.*, **101** : 145.  
1959. Schedl, *Trans. Roy. ent. Soc.*, **111** : 492.  
1969. Schedl, *Kontyu*, **37** (2) : 206.  
1978. Browne, *Oriental Ins.*, **12** (4) : 582.  
1987a. Maiti and Saha, *Bull. zool. Surv. India*, **8** (1-3) : 8 and 9.  
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 667-668.

3. *Xyleboricus angulatus* Schedl

1942. Schedl, *Kol. forestl. Mittlg.*, **5** : 183, *Lectotype* : Female in Mus. Nat. Hist., Wien. *Type-locality* : Selangor (Buloh Forest Reserve), Malaysia.  
1989. Wood, *Gt. Basin Nat.*, **49** : 668 (Synonymy).

*Description : Female* : Body long and cylindrical; pronotum blackish brown and elytra, leg and antennae light brown in colour. Body length 1.80-2.00 mm; 2.8-2.9 times as long as wide.

Frons moderately convex, surface reticulate with sparse punctures and fine hairs; median line absent; irregular, distinct and indistinct granules present above epistomal margin.

Pronotum elongate, 1.3 times as long as wide; basal margin substraight; lateral sides subparallel upto posterior two-thirds; antero-lateral margins weakly converging and broadly rounded anteriorly with indistinct asperities, anterior one-third with fine asperities and with sparse erect long setae; posterior portion finely reticulate with sparse and minute punctures.

Scutellum subround and small.

Elytra 1.1 times as long as and as broad as pronotum; lateral sides subparallel upto basal three-fourths, then narrowing posteriorly and terminating into an angular apex; nearly half of elytra smooth and flat; striae not at all impressed but marked by moderately large but very shallow punctures; interstriae almost flat, with sparse hair-like setae in row, becoming weakly ridged slightly before the commencement of declivity. Declivity abrupt and commencing from posterior one-fourth of elytra; declivital

face plano-convex; postero-lateral margins of declivity distinctly carinate; declivital striae marked by large and shallow punctures, punctures weakly and reticulately sculptured inside and each with a microhair; interstriae weakly but sharply ridged slightly before the commencement of declivity upto centre of declivital face; interstriae with prominent tubercles and recumbent hairs in row, particularly at the commencement of declivity; tubercles gradually decreasing in size posteriorly; both striae and interstriae distinctly marked towards lateral margins of declivital face than at the middle.

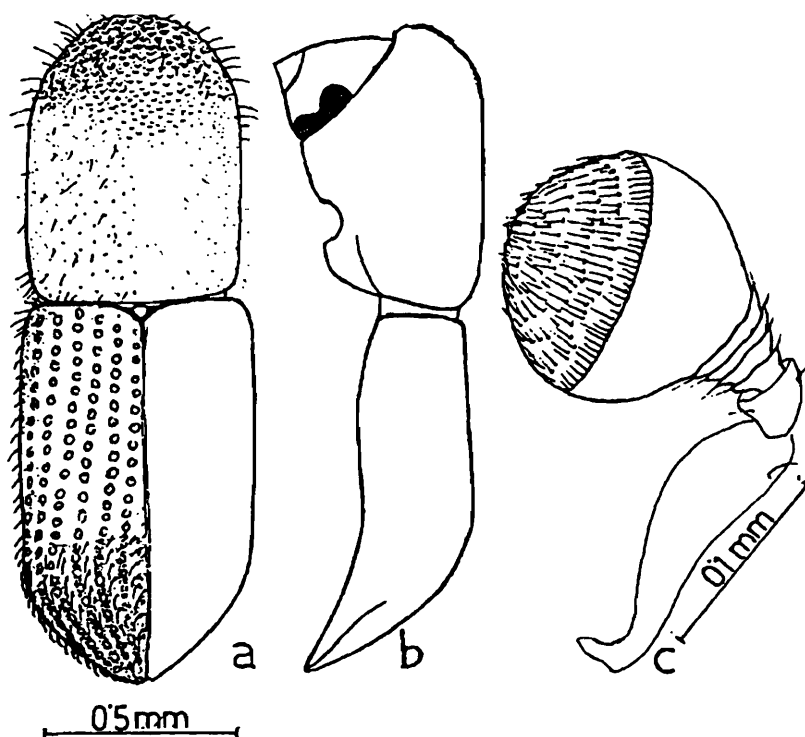


Fig. 22. : *Arixyleborus mediosectus* (Egger), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna.

*Male* : Not available for study.

*Distribution* : INDIA : Andaman Islands, Middle and North Andamans; Assam. ELSEWHERE : Khemer Republic (Cambodia), Sri Lanka, Malaysia, Indonesia and Vietnam.

*Hosts* : *Atrocarpus chaplasi*, *Canarium euphyllum*, *Dendrocalamus strictus*, *Dipterocarpus turbinatus* and *Terminalia bialata*.

*Remarks* : *Arixyleborus mediosectus* Eggers is a well represented species in the Orient and is recorded for the first time in a number of occasions in the middle and north Andamans. Numerous host records constitute the sole biological information of the species from India (Beeson, 1941) and from Malaya (Browne, 1961).

16. *Arixyleborus medius* (Eggers)  
(Fig. 23)

1. *Webbia medius* Eggers

1927. Eggers, *Philipp. J. Sci.*, **33** : 104-105, Lectotype Female in U. S. Nat. Mus., Washington.  
*Type-locality* : Mindanao, Provinz Lanao, Philippines.

2. *Xyleboricus medius* (Eggers)

1936. Schedl, *Philipp. J. Sci.*, **60** : 64.

3. *Arixyleborus medius* Eggers

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 668.

*Description* : *Female* : Body long and cylindrical; head, pronotum and elytra deep reddish brown; legs and antennae yellowish brown in colour. Body length 1.70-1.75 mm, nearly 2.7 times as long as wide.

Frons moderately convex, surface finely reticulate, with a few scattered punctures and fine hairs; median line indistinct; fringe of hairs below epistomal margin and with irregular indistinct granules below it.

Pronotum elongate, 1.3 times as long as wide; anterior half with fine asperities, gradually increasing in size anteriorly intermingling with scattered fine and short hairs; posterior half finely reticulate with sparse minute and shallow punctures.

Scutellum subround and shiny.

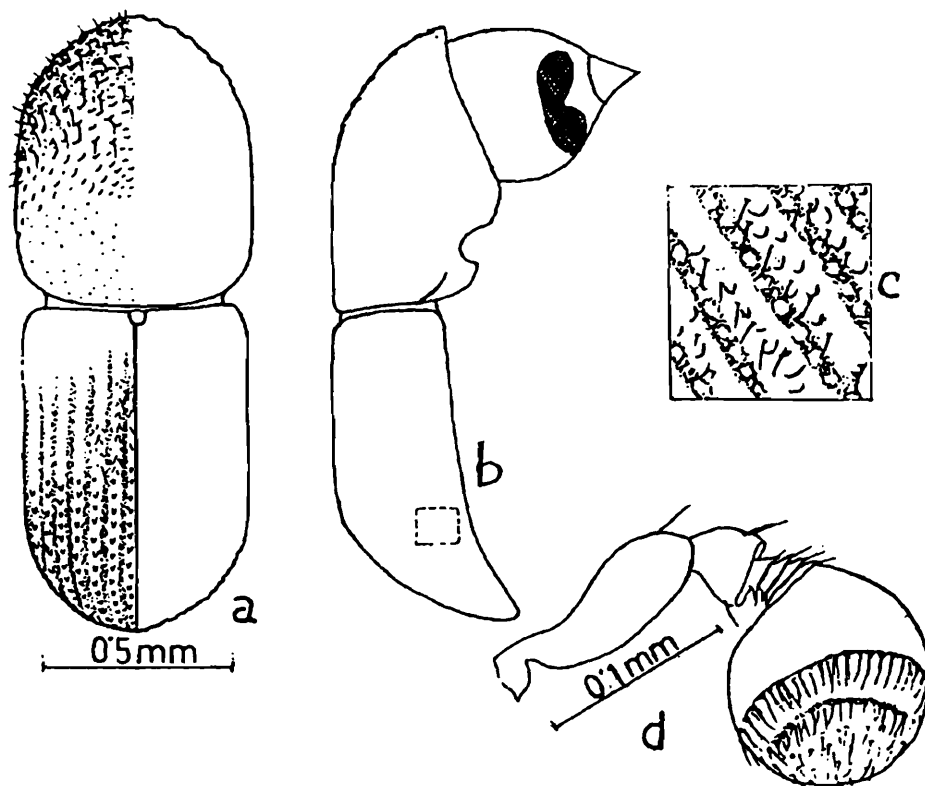
Elytra slightly longer and as wide as pronotum and 1.4 times as long as wide; lateral sides subparallel upto basal two-thirds; broadly rounded postero-laterally and terminating into a somewhat angular apex; postero-lateral margins not carinate, rather marked by a row of distinct granules; elytral base somewhat smooth and shiny, rest of elytra opaque; all striae posteriorly beyond the basal strip deeply impressed, reticulately sculptured, hardly marked by any distinct puncture; interstriae ridged attaining its maximum height at commencement of declivity with minute and blunt tubercles, and short hairs almost in single row. Declivity commencing on posterior third and gradually sloping posteriorly, declivital face moderately convex, declivital striae and interstriae distinctly marked as on the disc; striae 1, 2, 3, 6 and 7 running almost to the posterior margin, striae 4 and 5 forming a loop almost at the middle of declivity; all interstriae running upto posterior margin except 5; recumbent setae at the base of tubercles in declivity.

*Male* (Browne, 1960) : Body cylindrical, colour brown. Body length 1.6 mm, 3.0 times as long as wide. Head not concealed from above by pronotum, frons plano-convex, transversely depressed above emistoma; surface smooth, shining and subimpunctate. Eyes small and narrow. Pronotum 1.55 times as long as wide, widest

in apical third, the base transverse, basal angles angularly rounded, sides weakly incurved in basal third, apex broadly rounded and unarmed, weakly transversely depressed at the middle and feebly declivous only at apex; smooth, shining, subimpunctate and subglabrous. Scutellum rounded.

Elytra as wide as pronotum and similar to elytra of female but more weakly sculptured.

*Distribution* : INDIA : *Andaman Islands* : North and Middle Andamans. ELSEWHERE : Philippines, Malaysia, Vietnam, Indonesia, Sri Lanka and Australia (Imported).



**Fig. 23** : *Arixyleborus medius* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, enlarged portion of elytral declivity; d, antenna.

*Hosts* : *Artocarpus chaplasha*, *Canarium euphyllum*, *Dipterocarpus turbinatus*, *Diospyros oocarpa*, *Sterculia villosa*, *Terminalia bialata*, *T manii*.

*Remarks* : *Arixyleborus medius*, a species first described under the genus *Webbia* by Eggers (1927), was synonymised under *Arixyleborus rugosipes* Hopkins by Schedl (1951-52). Subsequently, like many other authors, Maiti and Saha (1986) continued to consider it as *A. rugosipes* which was recently treated by Wood and Bright (1992) as *A. medius*.

The species usually infests dead, dying and felled logs of many host-plants especially *Dipterocarpus* plants (Beeson, 1941 as *Xyleboricus camphorae* (Eggers); Mathur and Singh, 1960; Saha and Maiti, 1986).

17. *Arixyleborus moestus* (Eggers)  
(Fig. 24)

1. *Xyleboricus moestus* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, **14** (19) : 189, *Holotype* : Female in F.R.I., Dehra Dun.  
*Type-locality* : Shillong, Meghalaya, India.

2. *Arixyleborus moestus* (Eggers)

1956. Browne, *Sarawak Mus. J.*, **6** : 350.

1958. Schedl, *Tijdschr. Ent.*, **101** : 146.

1987a. Maiti and Saha, *Bull. zool. Surv. India*, **8** (1-3) : 4-6.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 668.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 808-810.

2000. Saha and Maiti, *State Fauna Series 4 : Fauna of Meghalaya*, Part 5 : 641, 645.

*Description : Female* : Body stout and somewhat cylindrical; head, pronotum and elytra blackish brown, antennae and legs paler. Body length 2.60 mm, 2.6 times as long as wide.

Frons convex with a distinct median line, surface finely reticulate with large comparatively close punctures and with a few distinct granules somewhat in transverse rows above it.

Pronotum 1.10 times as long as wide; basal margin substraight, very weakly emarginate on either side of middle, lateral sides subparallel upto basal three-fifths, whence weakly converging and broadly rounded anteriorly; anterior half with weak asperities gradually increasing in size anteriorly and with scattered fine short hairs; posterior half reticulate and apilose with scattered indistinctly visible granules and punctures.

Scutellum subround and shiny.

Elytra 1.30 times as long as and slightly wider than pronotum and 1.44 times as long as its width; basal margin substraight, lateral margins subparallel upto two-thirds, thence weakly converging posteriorly with broadly rounded apex; postero-lateral margins not carinate, but with granules; nearly one-fifth of basal disc somewhat smooth and shiny, rest of elytra opaque; disc with deeply impressed striae marked by distinct punctures, sculptured within; interstriae rather weakly convex with irregular and blunt granules increasing in size posteriorly and a few tubercles along with granules, somewhat distinct at commencement of declivity. Declivity commencing abruptly at posterior one-third and declivital face flat, opaque and roughened with numerous blunt irregular granules; striae 1 and 2 distinctly marked beyond the middle and 3 and 4 upto middle and the rest obsolete; interstriae with two or three rows of irregular recumbent hairs.

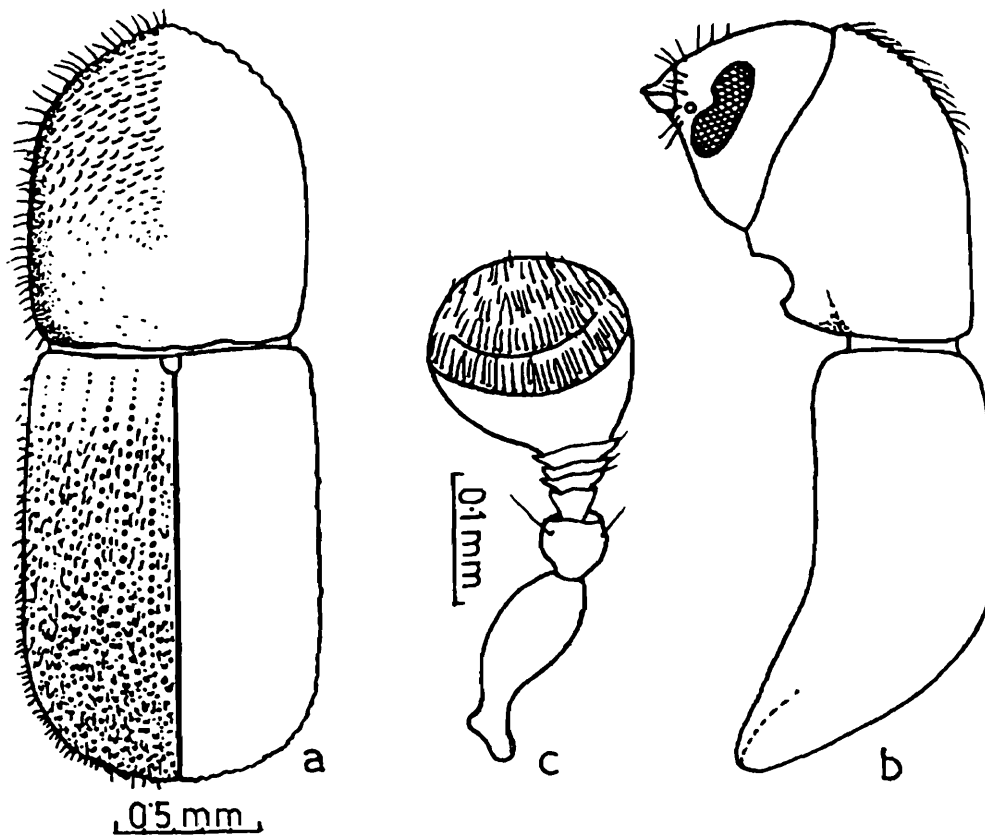


Fig. 24 : *Arixyleborus moestus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna.

*Male* : Unknown.

*Distribution* : INDIA : *Meghalaya* : Shillong and *West Bengal* : Darjiling Dist., Debrepani. ELSEWHERE : None.

*Host* : *Quercus lamellosa*.

*Remarks* : The species belongs to the granifer-group of the genus *Arixyleborus* in having multituberculate interstriae. It can easily be distinguished from all other Indian species of the genus in having this character as well as confused blunt granules in the declivity. The species is so far known as a borer of *Quercus lamellosa* in India and occurs in fairly high altitudes of the eastern hilly territories (Beeson, 1930 and 1941).

### Genus *Cnestus* Sampson

#### 1. *Cnestus* Sampson

1911. Sampson, *Ann. Mag. nat. Hist.*, 7 (8) : 383.

1914. Hopkins, *Proc. U.S. nat. Mus.*, 48 : 118.

1955. Browne, *Sarawak Mus. J.*, 6 : 367.

1959. Schedl, *Trans. Roy. ent. Soc. Lond.*, 111 : 511.

1961. Browne, *Malay. Forest Rec.*, No. 22, p. 173.  
 1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 78.  
 1978 Wood, *Annl. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.  
 1986. Maiti and Saha, *Rec. zool. Surv. India*, No. 86 : 70.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 801.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 810.

## 2. *Tosoxyloborus* Murayama

1950. Murayama, *Trans. Shikaku ent. Sec.*, **1** : 49.  
 1963. Browne, *Ent. Ber.*, **23** : 54 (Synonymy).

*Type of genera* : (i) *Cnestus* : *C. magnus* Sampson; (ii) *Tosoxyloborus* : *T pallidipennis* Murayama

The genus *Cnestus* was described by Sampson (1911) based on the type species, *C. magnus* Sampson from Sri Lanka. It remained practically unknown until 1956, when Browne described two more species from Malaya under it. Later on, Murayama (1950) erected a monobasic genus *Tosoxyloborus* which according to Browne (1963) was congeneric to *Cnestus*. However, *Cnestus* is now a well defined genus represented by 21 species distributed in India, Sri Lanka, Indo-China, Malaysia, Indonesia, Philippines, New Guinea and Australia. There are five species represented from the Indian Region, but the material of *C. nitidipennis* (Schedl) and *C. bicornis* (Eggers) are not available for study and existing description is inadequate, hence the species is not included in the present study.

### General characters of the genus *Cnestus* Sampson.

*Description : Female* : Body generally short and cylindrical; head, pronotum and elytra pitchy black to blackish brown; antennae and legs pale yellow, femur more paler. Body length 2.30-2.70 mm, 2.00-2.20 times as long as wide.

Frons flatly convex with distinct and shiny median line, surface roughened, reticulately punctate and hairy. Eyes elongately oval and of moderate size with a weak emargination. Antennal scape long and sometimes almost half the antennal length; funicle with 4 segments; club obliquely truncate, segment 1 corneous; on anterior face, basal corneous portion with recurved apical costate margin almost forming a complete ring; truncate face marked by single recurved suture; posterior face with one suture more towards apex.

Pronotum nearly as long as broad or slightly longer; basal margin distinctly or feebly bisinuate; anterior margin weakly produced, accommodating 4 to 5 asperities, middle two being much longer; summit more or less at the middle; anterior declivous area with distinct asperities; posterior half shiny with small or large punctures; some times postero-median portion with tuft of hairs (*C. suturalis*).

Elytra either shorter or longer (1.1-1.2 times) than pronotum; basal margin either substraight or each elytron feebly outcurved; lateral sides subparallel or gradually narrowing posteriorly to broadly rounded apex, sometimes separately rounded at sutural apex (*C. cruralis*) : postero-lateral margins either rounded or with carinae. Elytral declivity of respective species varies widely with regard to the occurrence of striae, granules and hairs, etc.

### Key to the species of *Cnestus* Sampson based on females

1. Anterior margin of pronotum distinctly produced and accommodating about 14 to 15 asperities of almost equal size; scutellum comparatively very large; postero-lateral margins somewhat rounded, devoid of any carina; hairs and punctures on entire elytral surface inconspicuous; large species, body length, 3.50 mm .....  
..... *C. protensus* (Eggers)
- Anterior margin of pronotum slightly produced, accommodating not more than 4 to 5 distinct asperities; scutellum comparatively small; postero-lateral margins distinctly carinate and confluent with interstria 7; entire elytral surface with both punctures and hairs; smaller species, body length, 2.30-2.70 mm ..... 2
2. Declivital face convex, without any granules or tubercles; postero-lateral margins of declivity feebly carinate, but not elevated; posterior half of pronotum with inconspicuous sparse punctures; body length, 2.30-2.35 mm .....  
..... *C. suturalis* (Eggers)
- Declivital face feebly impressed medially and interstriae 3 and 4 with setaceous granules; postero-lateral margins of declivity carinate and distinctly elevated; posterior half of pronotum with large close punctures; body length, 2.50-2.70 mm .....  
..... *C. cruralis* (Schedl)

### 18. *Cnestus cruralis* (Schedl)

(Fig. 25)

#### 1. *Xyleboricus cruralis* (Schedl)

1975. Schedl, *Rev. suiss. Zool.*, **82** (3) : 456, *Holotype* : Female in Nat. Hist. Mus. Wien. *Type-locality* : Siam (Thailand).

#### 2. *Cnestus cruralis* (Schedl)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 802.

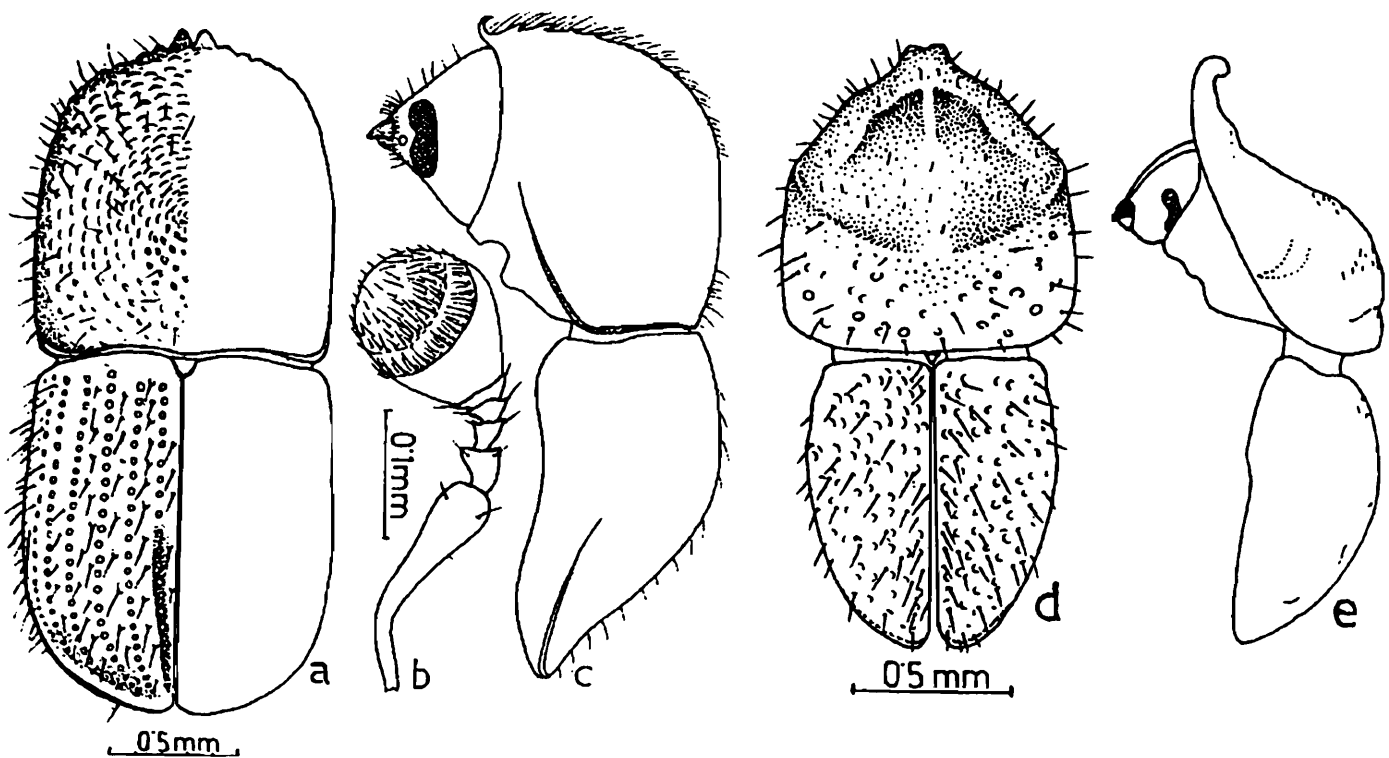
*Description* : *Female* : Body short and cylindrical; head, pronotum and elytra blackish brown; antennae and legs slightly paler, femur yellowish white. Body length 2.65-2.70 mm, 2.2 times as long as wide.

Frons convex with a smooth median longitudinal line broadening towards vertex; either side of median line reticulate with scattered punctures and hairs. Antennal scape thin and long; funicle with 4 segments; club obliquely truncate; on anterior face,

basal corneous portion with recurved apical costate margin almost forming a complete ring; truncate face marked by one distinct recurved suture; posterior face with a single suture more towards apex.

Pronotum only slightly longer, 1.08 times longer than broad; basal margin bisinuate; postero-lateral corners flattened to a acute margin forming carina extending upto the middle of pronotum; anterior margin with acute projection bearing four asperities, the median two being much longer; summit almost at the middle; anterior declivous area with dense and fine asperities, crescentically arranged above summit; posterior portion shiny with fine but deep punctures; vestiture of long erect hairs, more dense on anterior half.

Scutellum triangular.



**Fig. 25 :** *Cnestus cruralis* (Schedl), Female : a, Pronotum and elytra in dorsal view; b, antenna; c, head, pronotum and elytra in lateral view. Male : d, Pronotum and elytra in dorsal view; e, head, pronotum and elytra in lateral view.

Elytra about 1.1 times as long as and as wide as pronotum, 1.20 times as long as its width; basal margin of each elytron feebly outcurved; sides feebly outcurved rather subparallel on basal third, thence very gradually narrowing posteriorly; each elytron somewhat separately rounded at apex near sutural angles; discal striae feebly impressed with fairly large and deep punctures; interstriae uniseriately punctate, punctures almost of equal size to those of striae and somewhat confused behind; entire surface roughly sculptured. Declivity commencing shortly before the middle, apical margin acutely elevated and carinate, confluent with interstria 7; stria 1 impressed, strial punctures rather obscure posteriorly; sutural interstria elevated and

devoid of any puncture or granule; interstria 2 depressed, more so in median third of declivital face with setose granules, interstriae 2 and 4 forming low convexity and each with setose granules. Procoxae contiguous; pro- and meso-tibiae with 5 and 7 teeth respectively.

*Male* : Body deformed and reduced; head and pronotum blackish brown, elytra comparatively lighter; antennae and legs light brown, femur yellowish white. Body length 1.80 mm; 2 times as long as wide. Head subsquarish; frons smooth and weakly depressed in longitudinal groove becoming prominent towards vertex; vestiture inconspicuous, except fringe of hairs on epistomal margin.

Pronotum highly modified, 1.17 times as long as broad; almost as long as elytra; basal margin weakly outcurved; postero-lateral corners broadly rounded; lateral sides on basal half subparallel, thence strongly converging anteriorly terminating into a bidentate blunt point, weakly directed upwards; in profile, anterior half strongly sloping with depressed face and with granules and microhairs; median line inconspicuous; posterior half with irregular shallow punctures and with indistinct microhairs.

Elytra short, surface strongly convex and slightly narrower than pronotum; basal margin not distinctly demarcated, but very much depressed; basal one-fourth of lateral sides subparallel, thence strongly converging posteriorly; apex of each elytron individually narrowly rounded; elytral disc roughened and with distinct convexity at the middle; striae and interstriae obsolete, but entire surface with large granules and indistinct hairs. Declivity commencing on posterior third, surface uneven with granules and hairs; striae and interstriae obsolete.

*Distribution* : INDIA : *Andaman Island* and *West Bengal* : Darjiling Dist., Samsingh. ELSEWHERE : Xizang (Tibet) in China and Thailand.

*Remarks* : Some material from the Andamans and Samsingh, West Bengal had earlier been erroneously assigned to *Cnestus bicornioides* (Schedl) (Maiti and Saha, 1986, and Saha and Maiti, 1996). But after careful study, these material are now considered as *C. cruralis* (Schedl). Biology of the species is unknown, except its record from unknown Wood.

### 19. *Cnestus protensus* (Eggers)

#### 1. *Xyleborus protensus* Eggers

1930. Eggers, *Indian Forest Rec.*, 14 (9) : 201, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Shillong, Meghalaya, India.

#### 2. *Cnestus protensus* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 803.

*Description* : *Female* : Body short and stout; surface shiny; head, pronotum and elytra pitchy black; legs and antennae pale brown. Body length, 3.50 mm (Holotype); nearly twice as long as wide.

Frons plano-concave, mostly concealed under the anterior projection of pronotum; surface with distinct punctures and long erect hairs; two distinct black swelling above the mandible, fringe of hairs above it.

Pronotum without anterior projection nearly as long as broad; basal margin broadly emarginate, basal two-thirds parallel sided, thence abruptly narrowing anteriorly, anterior margin distinctly produced, projected part with four asperities medially and five on each side laterally, all the asperities of equal size and shape; indistinct summit nearly at middle, anteriorly with distinct sparse asperities, forming 5-6 rows; posterior half shiny with large punctures; anteriorly with long hairs, inconspicuous on posterior portion, except laterally.

Scutellum very large.

Elytra nearly as long as wide and smaller than pronotum with antero-lateral corners angularly rounded; lateral sides subparallel upto middle, gradually broadly rounded posteriorly; postero-lateral margins rounded, devoid of any carina; disc slightly convex and gradually sloping upto elytral apex; elytral punctures and hairs inconspicuous.

*Male* : Unknown.

*Distribution* : INDIA : *Meghalaya* : Shillong. ELSEWHERE : None.

*Remarks* : It is a very distinct species immediately recognised by its very prominent asperities on unusually projected anterior margin of pronotum. Further, the elytra almost as long as broad and smaller than pronotum, elytral margin distinctly rounded, postero-lateral margins devoid of any carina and scutellum exceptionally large. The species is solely represented by Holotype material so far.

## 20. *Cnestus suturalis* (Eggers) (Fig. 26)

### 1. *Xyleborus suturalis* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 24, *Holotype* : Female, in F.R.I., Dehra Dun.  
*Type-locality* : Shillong, Meghalaya, India.

1950. Schedl, *Tijdschr. Ent.*, 93 : 87, Male.

1962. Schedl, *Verhandl. Naturf. Ges. Basel*, 73 (1) : 187.

### 2. *Cnestus suturalis* (Eggers)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 85* : 74-76, Fig. 17, a and b.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 803.

2000. Saha and Maiti, *State Fauna Series 4 : Fauna of Meghalaya, Part 5* : 641, 645.

*Description : Female* : Body short and stout, broader anteriorly; head and pronotum pitchy black; elytra pale yellowish except a blackish strip along the interstriae 1 and

2, as well as on declivital face; antennae and legs light brown. Body length 2.30-2.35 mm; body about 2 times as long as wide.

Frons flatly convex with a distinct median line; surface sparsely hairy, roughened and reticulate with scattered granules anteriorly and punctures posteriorly. Antennae as in *C. cruralis*.

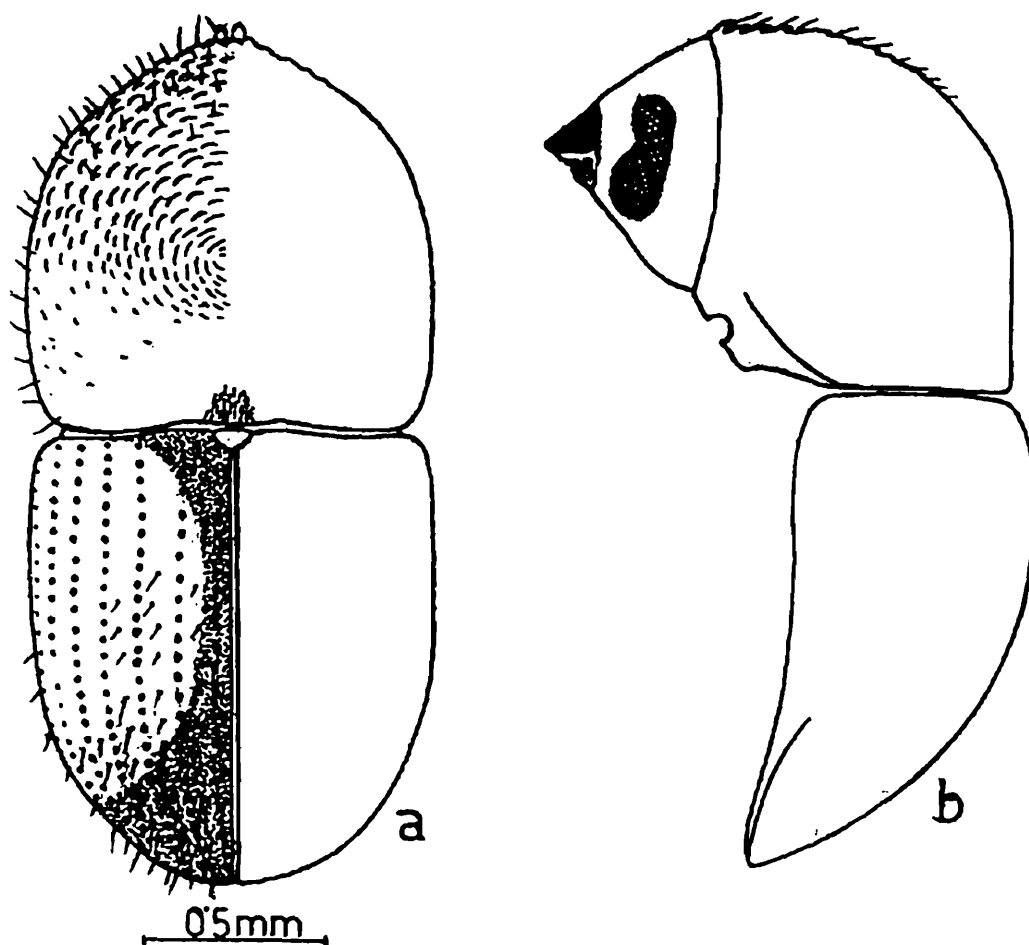


Fig. 26 : *Cnestus suturalis* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum subquadrate; almost as long as broad; basal margin weakly bisinuate; postero-lateral angles with weak carina; sides subparallel, broadly rounded anterior margin with a median weak projection accommodating four distinct elongate asperities of which median two longer and pointed; in profile, dorsal margin almost straight on basal half and declivous on anterior half; summit at the middle, prominent with crescentic rows of asperities around it; declivous portion with crescentic rows of small asperities gradually increasing in size towards apex and with distinct hairs; posterior half reticulate and shiny with scattered small punctures; basal median portion with a tuft of hairs.

Scutellum smooth and shiny, slightly broader than long and triangular in shape.

Elytra 1.2 times as long as and as wide as pronotum, 1.1 times as long as its own width; basal margin substraight; lateral sides gradually narrowing posteriorly and strongly converging posteriorly from the commencement of declivity terminating into a rounded apex; postero-lateral angles with weak carinae; elytral disc convex, smooth and shiny, devoid of any conspicuous hairs except laterally; striae feebly marked with shallow fine punctures except stria 1 being distinctly impressed; interstriae very wide with single row of indistinct sparse punctures. Declivity not pronounced, but somewhat gradually sloping almost from the middle at the level of interstriae 1, 2 and distinctly declivous on posterior one-sixth; declivital striae 1 and 2 very much impressed and 3 and 4 moderately so; interstriae somewhat weakly convex with weak granules and small hairs. Procoxae slightly separated. Protibiae with 5 teeth.

*Male* : Male not available for study.

*Distribution* : INDIA : *Meghalaya* : Shillong; *Andaman Island* : South Andaman. ELSEWHERE : Malaysia, Indonesia (Java) and Tonkin Island (Vietnam).

*Host* : *Terminalia myriocarpa*.

*Remarks* : The species is sparsely known from only a few locality in the Orient, since its first description from Meghalaya, India, being recorded from *Terminalia myriocarpa* (Eggers, 1930 and Beeson, 1941). Recently, it has been reported from South Andamans and transferred to the genus *Cnestus* by Maiti and Saha (1986).

### Genus *Coptodryas* Hopkins

#### 1. *Coptodryas* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 10, 54.

1986. Wood, *Gt. Basin Nat. Mem.*, No. 10 : 84.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A): 822.

#### 2. *Adryocoetes* Eggers

1951. Eggers, *Ent. Blätt.*, **45-46** :

1952. Schedl, *Philipp. J. Sci.*, **80**(3) : 371 (Synonymy).

#### 3. *Microperus* Wood

1980. Wood, *Gt. Basin Nat.*, **40** (1) : 94-95.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No.* **86** : 97.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 823.

1986. Wood, *Gt. Basin Nat. Mem.*, No. 10 : 94 (Synonymy).

*Type of genera* : *Coptodryas* : *C. confusa* Hopkins; *Adryocoetes* : *A. nitidus* (nom. nud.) = *Xyleborus pullus* Schedl; *Microperus* : *Xyleborus theae* Eggers.

The genus *Microperus* was established by Wood (1980) based on *theae* group of species belonging to the genus *Xyleborus*, which was originally named in Browne's unpublished manuscript. However, this genus does not stand valid now, since Wood (1986) had synonymised it under *Coptodryas*. The genus can easily be distinguished from all other genera under the tribe Xyleborini in having submerged scutellum, antennal club with apical non-costate margin of basal corneous portion and single suture on posterior face, and basal margin of each elytron feebly outcurved. Eight species of the genus *Xyleborus* occurring in India, have been transferred here for the first time to this genus.

### General characters of the genus *Coptodryas*.

*Female* : Body broadly to narrowly cylindrical; colour varies from yellowish to dark brown, elytra sometimes darker; antennae and legs paler. Body length 1.70-2.60 mm, 2.1-2.7 times as long as wide.

Head globose, frons plano-convex to convex, surface finely reticulate with either punctures or granules or with both, median line if present rather indistinct. Eyes oblong, more or less half of its width emarginate. Antennal scape short and stout or slender, funicle with 5 segments, club with basal corneous portion reduced with procurved or recurved non-costate apical margin with one more suture above it; posterior face with one suture apically.

Pronotum as long as or 1.20 times as wide as long; basal margin weakly bisinulate; lateral sides subparallel or feebly outcurved; anterior margin narrowly to broadly rounded, either unarmed or armed with 6-8 asperities (*C. concinnus* and *C. elegans*); summit either distinct or indistinct, placed almost at the middle or at anterior one-third; anteriorly with distinct asperities, asperities more distinct in *C. concinnus* and *C. elegans*, a few extending postero-laterally and either with small or long erect hairs; basal portion smooth with fine scattered punctures, but sometimes surface finely reticulate and granulate (*C. concinnus* and *C. elegans*); vestiture posteriorly sparse or inconspicuous, sometimes with fringe of hairs at pronotal base.

Scutellum submerged and not at all visible.

Elytra 1.30-1.60 times as long as and as wide as pronotum, 1.3-1.5 times as long as its width; basal margin very weakly outcurved at the level of interstriae 3-4, devoid of any scutellar space; lateral sides subparallel upto anterior two-thirds whence converging posteriorly with narrowly to broadly rounded apex; postero-lateral margins distinctly carinate and confluent with interstria 7, discal striae weakly impressed with shallow, small and closely distinct punctures; interstriae either flat or weakly convex, wider than striae with very minute punctures. Declivity commencing from middle to apical fifth and face rather gradually sloping.

**Key to the species of *Coptodryas* Hopkins based on females**

1. Postero-lateral margins of declivity distinctly carinate, carinae confluent with interstria 7 ..... 2
  - Postero-lateral margins of declivity not carinate, rather granulate ..... 6
2. Interstriae 3-5 elevated at declivital upper half and sometimes ridged with small granules, interstria 4 strongly elevated; posterior portion of pronotum below the summit with obsolete asperities ..... 3
  - Interstriae not elevated as declivital upper half, but marked with granules or tubercles; posterior portion of pronotum below the summit without asperities, rather with punctures ..... 4
3. Ridge on interstria 4 abrupt, hardly extending beyond the upper half of declivity; body length 2.30 mm ..... *C. concinnus* (Beeson)
  - Ridge on interstria 4 not abrupt, rather gradually sloping, narrowing posteriorly and extending beyond the upper half of declivity; body length 2.20 mm .....  
..... *C. elegans* (Sampson)
4. Elytral disc incurved slightly below the basal margin (like saddle back); elytral interstriae with distinct tubercles and striae punctures subgranulate; body length 1.80 mm ..... *C. undulatus* (Sampson)
  - Elytral disc flat; all the declivital interstriae with sparse granules except on interstria 2, if at all present, only at the commencement of declivity; body length 1.75-1.80 mm ..... 5
5. Declivital face convex and gradually sloping, interstria 1 with 3 distinct tubercles ..... *C. alpha* (Sampson)
  - Declivital face flat and abruptly sloping, interstria 1 with only one distinct tubercle ..... *C. recidens* (Sampson)
6. Smaller species; declivital face of elytra abrupt, surface opaque and striae punctures indistinctly marked; postero-lateral margins of declivity with larger granules; body length 1.70-1.72 mm ..... *C. perparvus* (Sampson)
  - Larger species; declivital face of elytra gradually sloping, surface shiny and striae punctures distinctly marked; postero-lateral margins of declivity with smaller granules; body length 2.25-2.60 mm ..... 7
7. Elytral apex broadly rounded; striae punctures on disc large, generally reticulately sculptured inside and becoming still larger and confused towards declivital face; declivital interstriae with distinct granules; posterior half of pronotum with distinct punctures; body length 2.50-2.60 mm ..... *C. chrysophylli* (Eggers)
  - Elytral apex narrowly rounded; striae punctures small throughout, devoid of any sculpture inside and not confused, rather in uniform rows; declivital interstriae with indistinct granules; posterior half of pronotum with distinct granules; body length 2.25-2.30 mm ..... *C. mus* (Eggers)

21. *Coptodryas alpha* (Sampson)  
(Fig. 27)

1. *Xyleborus bicolor* Blandford var. *alpha* Sampson

1923. Sampson, *Ann. Mag. nat. Hist.*, 11 (9) : 289, *Holotype* : Female, in F.R.I., Dehra Dun.  
*Type-locality* : Sundarbans, West Bengal.

2. *Xyleborus alpha* Sampson

1929. Beeson, *Brit. Mus. nat. Hist.*, 4 (4) : 239.

1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 49.

1959. Schedl, *Trans. R. ent. Soc. Lond.*, 111 : 505.

1971. Schedl, *Oriental Ins.*, 5 (9) : 364.

3. *Coptodryas alpha* Sampson

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 823.

4. *Microperus alpha* Sampson

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 824-825.

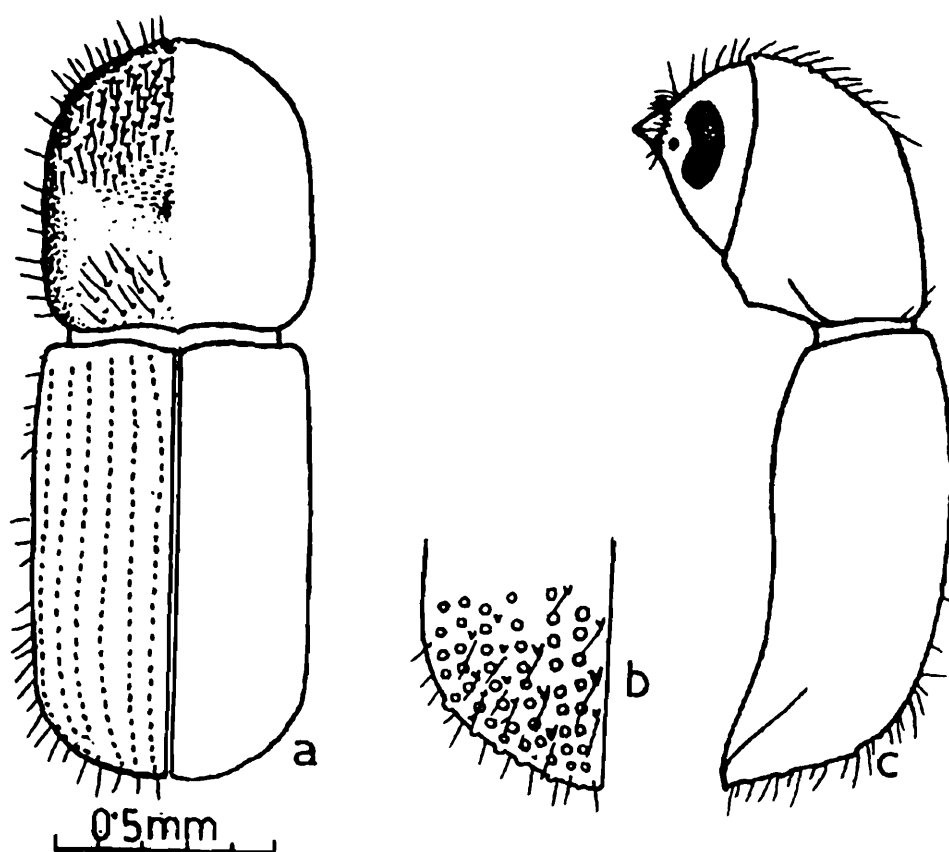
*Description : Female* : Body short, stout and somewhat cylindrical; head, pronotum and elytra reddish brown; antennae and legs paler. Body length 1.75-1.80 mm, 2.7 times as long as wide.

Head globose; frons weakly convex, but transversely depressed above the epistoma on either side of a narrow median area; surface finely reticulate, punctures inconspicuous, but with a few hairs, more dense towards epistomal margin. Antennal scape short and stout; club with basal corneous portion reduced on anterior face, apical margin recurved and not costate, with one more suture above it; posterior face marked by a distinct suture apically.

Pronotum subquadrate, 1.11 times as long as wide; lateral margin subparallel upto basal two-thirds, thence rather gradually narrowing anteriorly, anterior margin broadly rounded and unarmed; summit somewhat distinct and placed almost at anterior third; anterior one-third with weak asperities, few extending postero-laterally and with long erect and small hairs; nearly basal two-thirds smooth with fine scattered punctures and a few hairs.

Scutellum submerged and not visible.

Elytra 1.35 times as long as and as wide as pronotum, 1.5 times as long as its own width; basal margin very weakly outcurved at the level of interstriae 3-4 and rest of it substraight; lateral sides straight and subparallel upto basal fourth, whence converging posteriorly with a rounded apex; postero-lateral margins distinctly carinate, carinae confluent with interstria 7, disc smooth and shiny; striae weakly impressed



**Fig. 27** : *Coptodryas alpha* (Sampson), Female : a, Pronotum and elytra in dorsal view; b, enlarged view of declivity of single elytron; c, head, pronotum and elytra in lateral view.

with shallow small punctures; interstriae wider than striae with very minute punctures. Declivity commencing on apical fifth, face rather gradual and convex; striae marked by sparse small punctures, devoid of any microhair; interstriae 1 to 6 with either sparse granules or tubercles except interstria 2, with only a few granules at the commencement of declivity; vestiture of fine hairs from the base of each tubercle or granule.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Sibsagar, Nakachari; Lakhimpur, Upper Dihing Reserve. West Bengal : Jalpaiguri Dist., ELSEWHERE : Bangladesh, Malaysia and Sri Lanka.

*Hosts* : *Albizzia moluccana*, *Chrysophyllum roxburghii*, *Cordia grandia*, *Heritiera fomes*, *Quercus serrata*, *Shorea assamica*, *S. robusta* and *Vatica lanceaefolia*.

*Remarks* : Sampson (1923) established a variety (alpha) of a Japanese species *Euwallacea bicolor* (Blandford) based on the material from the Sundarban. These specimens do not tally exactly with the typical *E. bicolor* in having pronotum devoid of any median longitudinal line, short and abrupt declivity, declivital interstriae 1 and 2 (1 and 3 of Beeson, 1929) flat. However, Beeson (1929) gave this variety the

status of a species of the genus *Xyleborus* Eichhoff, which in fact deserve a place in the genus *Coptodryas* Hopkins on the basis of submerged scutellum and absence of scuteller emargination. Beeson (1930) was inclined to put the species under the genus *Xyleborinus* Reitter, a distinct genus characterized by scutellar emargination and conically projected scutellum hardly filling up the hairy scutellar space. These generic characters are totally absent in the species under consideration.

The species was recorded as a pin-hole border of a number of host-plants from different localities of the eastern India and Sir Lanka (Beeson, 1941). It is recorded from *Shorea robusta* in north Bengal and from the mangrove plant, *Heritiera fomes* in the Sundarban, although half a dozen of host-plants is known from India.

## 22. *Coptodryas chrysophylli* (Eggers)

(Fig. 28)

### 1. *Xyleborus chrysophylli* (Eggers)

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 29, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Lonagai Reserve, Sylhet, Bangladesh.

1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 53.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 303 p.

### 2. *Coptodryas chrysophylli* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 823.

### 3. *Microperus chrysophylli* (Eggers)

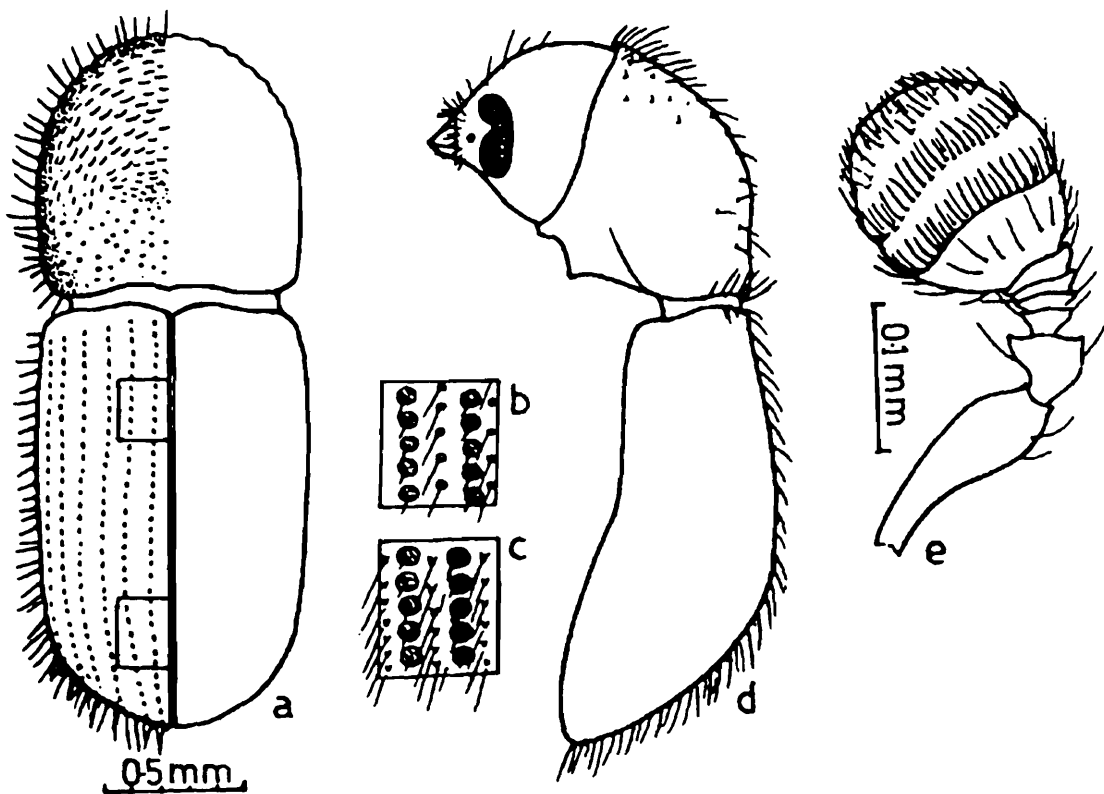
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 824, 825, Fig. 16, a-e.

*Description : Female* : Body long and cylindrical; head, pronotum, legs and antennae yellow, and elytra reddish brown. Body length 2.50-2.60 mm, 2.7 times as long as wide.

Frons plano-convex; surface finely reticulate, with shallow punctures and sparse long hairs. Antennal scape short and slender, basal corneous portion of club on anterior face with weakly procurved apical margin and not costate, one more suture visible above it; posterior face marked by a suture.

Pronotum nearly as long as wide; lateral sides subparallel on basal two-thirds, anterior margin broadly rounded and unarmed; summit distinct at the middle and slightly more than anterior half with transverse distinct asperities in crescentic manner, beyond that rather shiny and with distinct close punctures; surface with fine hairs, those on posterior half comparatively smaller.

Elytra 1.6 times as long as pronotum and its width; basal margin feebly outcurved at the level of interstriae 3 and 4; without any scutellar emargination; lateral sides



**Fig. 28** : *Coptodryas chrysophylli* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, head, pronotum and elytra in lateral view; e, antenna.

nearly subparallel upto basal three-fourths, posterior margin broadly rounded; postero-lateral margins closely granulate; narrow basal strip of elytral disc smooth with indistinct punctures, beyond which striae moderately impressed, with close distinct punctures, reticulately sculptured inside, sculpture gradually increasing towards the declivity, each with a microhair; interstriae feebly convex, smooth and shiny with a row of punctures, replaced by granules posteriorly and with fine irregular small hairs. Declivity commencing at posterior one-third; declivital face convex, but weakly impressed along striae and interstriae 1 and 2, interstria 1 complete and slightly wider, interstria 2 obsolete before the middle of declivity, interstria 3 diverging at declivital face and again converging towards apex; strial punctures very large, striae 1 and 2 joint at declivital face forming irregular rows of large close punctures; strial puncture with microhairs and interstriae with single row of close small granules and long erect hairs. Procoxae contiguous, protibiae with 5 teeth a both meso- and meta-tibiae with 8-9 teeth.

*Male* : Unknown.

*Distribution* : INDIA : West Bengal : Darjiling Dist., Samsingh. ELSEWHERE : Bangladesh.

*Host* : *Cinnamomum obtusifolium*.

*Remarks* : This is a very rare species so far known only from Bangladesh. Beeson determined three females present in F.R.I., Dehra Dun, as *Xyleborus chysophylli* (Egger) collected from *Cinnamomum obtusifolium* at Samsingh, North Bengal, which is reported here for the first time from India.

The characteristic irregular large strial punctures on declivital face and reticulately sculptured punctures serve as the distinctive characters of this species. However, *Chrysophyllum roxburghii* is the only host known from Bangladesh and *Cinnamomum obtusifolium* from India.

### 23. *Coptodryas concinnus* (Beeson) (Fig. 29)

#### 1. *Xyleborus concinnus* Beeson

1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 214, *Holotype* : Female, in F.R.I., Dehra Dun.  
*Type-locality* : Myanmar and Indonesia (Java).
1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 303 p.
1987. Saha and Maiti, *Bull. zool. Surv. India*, 8 (1-3) 75-76, Male, Fig. 3.

#### 2. *Coptodryas concinnus* (Beeson)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 824 (syn of *C. elegans*).

#### 3. *Microperus concinnus* (Beeson)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 824, 825-826.

*Description* : *Female* : Body small and cylindrical; head, pronotum and elytra reddish brown. Body length 2.30 mm; 2.2 times as long as wide.

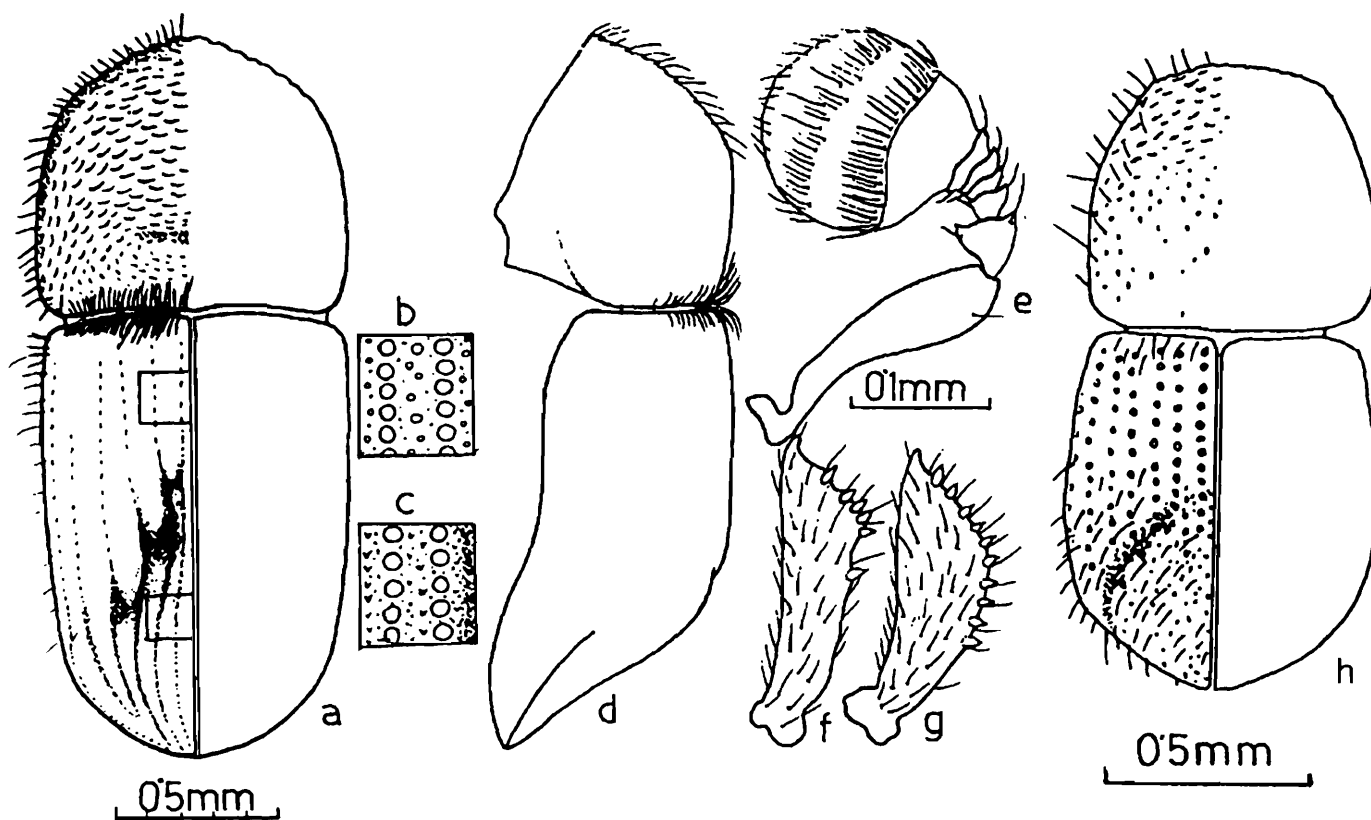
Head globose, frons plano-convex, surface finely reticulate with sparse granules, but devoid of any puncture; median line indistinct. Antennal scape short; basal corneous portion of club on anterior face with weakly procurved non-costate apical margin and another procurved suture above it; posterior face with one suture apically.

Pronotum about 1.1 times as wide as long; lateral sides feebly outcurved, gradually converging anteriorly; anterior margin rounded and accommodating some 6-8 transverse weak asperities; summit nearly at the middle; more than anterior half with distinct asperities, posterior half finely reticulate with granulate asperities; anterior half with long erect hairs extending laterally and fringe of hairs at pronotal base.

Scutellum submerged and not at all visible.

Elytra about 1.60 times as long as pronotum, basal margin feebly outcurved at the level of interstriae 3 and 4 without any scutellar emargination; lateral sides subparallel upto basal two-thirds and broadly rounded posteriorly; postero-lateral margins distinctly carinate and confluent with interstria 7; discal striae distinctly impressed, marked by

close distinct punctures, devoid of any microhair; interstriae weakly convex with uniseriate sparse minute punctures and hairs inconspicuous except a few towards basal margin; interstria 1 flat, narrow and widening towards apex. Declivity commencing almost at the middle, surface opaque and uneven; striae marked by shallow distinct punctures, stria 2 confluent with 1 slightly below the summit of declivity and divergent towards apex, 2 and 3 outcurved at declivital apical third, 6 reaching upto apex; interstriae plano-convex, opaque and marked by granules; interstriae 2, 3 and 4 becoming somewhat broadly ridged and widening at the commencement of declivity; ridge on interstria 4 abrupt, elevated to maximum height and hardly extending beyond the upper half of declivity.



**Fig. 29** : *Coptodryas concinnus* (Beeson), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, pronotum and elytra in lateral view; e, antenna; f, protibia; g, mesotibia; Male : h, Pronotum and elytra in dorsal view.

**Male** : Male is very similar to female, but differs as follows : Body length 1.60 mm; eyes feebly emarginate. Pronotal summit indistinct; anterior margin unarmed; surface on anterior one-third with weak asperities and a few extending laterally; posterior two-thirds with sparse fine granules. Elytra as in female, but striae feebly impressed and interstitial ridges on declivity comparatively weak. Procoxae subcontiguous.

**Distribution** : INDIA : *West Bengal* : Jalpaiguri Dist., Nagrakata. ELSEWHERE : Myanmar and Indonesia (Java).

**Host** : *Thea sinensis*.

*Remarks* : The species has originally been described by Beeson (1930) from Myanmar and Indonesia (Java) based on females only. Since then, it remains unknown from elsewhere, until the present study. However, Wood (1989) considered it as the synonymy of *Coptodryas elegans* (Sampson) and continued to maintain its status as referred to in the world catalogue (Wood and Bright, 1992). In the present study, we have kept it as a separate species based primarily on abrupt declivital ridge on interstria 4 (not so in *C. elegans*) in addition to other characters. It has been reported from a single collection from Nagrakata Tea estate, Jalpaiguri Dist. A small colony represented by male and females was collected from a tea plant, *Thea sinensis* in close association with another scolytid, *Euwallacea fornicatus* (Eichhoff). The species is very closely allied to *M. elegans* (Sampson) from which it differs in having highly raised interstria 4, but not extending beyond the upper half of declivity and stria 2 jointed with stria 1 at the summit of declivity. In Myanmar, the species has been taken from *Albizzia moluccana*.

#### 24. *Coptodryas elegans* (Sampson)

(Fig. 30)

##### 1. *Xyleborus elegans* Sampson

1923. Sampson, *Ann. Mag. nat. Hist.*, **11** (9) : 288-289, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Buxa, West Bengal, India.
1930. Beeson, *Indian Forest Rec. (Ent.)* **14** (10) : 57.
1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 304 p.
1962. Schedl, *Verhandl. Natuff Ges., Basel.*, **73** (1) : 186.

##### 2. *Coptodryas elegans* (Sampson)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 824.

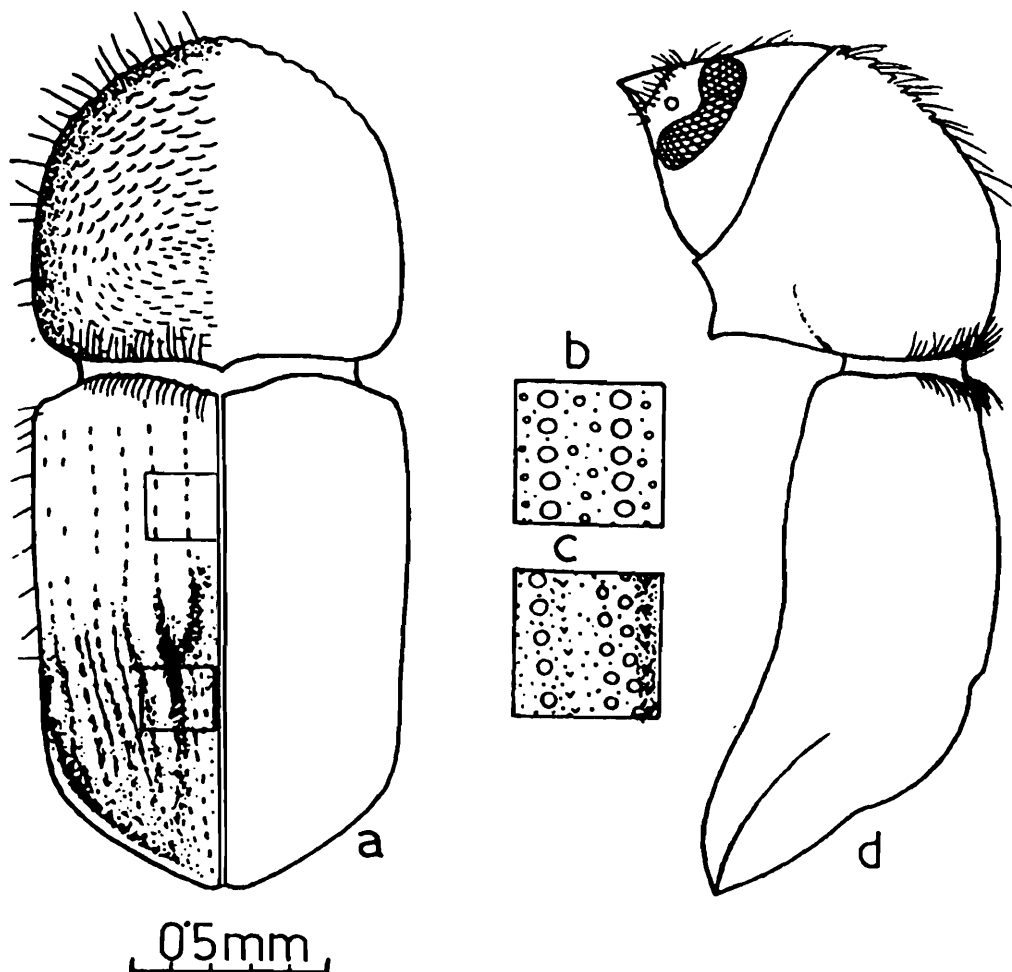
##### 3. *Microperus elegans* (Sampson)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 824 and 826.

*Description* : *Female* : Body small and cylindrical; head, pronotum and elytra reddish brown, antennae and legs paler. Body length 2.20 mm, about 2.2 times as long as wide.

Head globose, frons plano-convex with indistinct median line; surface reticulate, with sparse granules, without any punctures or median line. Eyes broadly emarginate. Antennae as in *M. concinnus* (Beeson).

Pronotum about 1.1 times as wide as long with basal margin substraight, lateral sides feebly outcurved, anterior margin broadly rounded accommodating some 6-8 transverse weak asperities of almost of equal size; weak transverse summit slightly below the middle; anterior half with distinct asperities and long erect hairs; posterior



**Fig. 30 :** *Coptodryas elegans* (Sampson), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, head, pronotum and elytra in lateral view.

half finely reticulate, small imbricate asperities in transverse rows with minute hairs; punctures inconspicuous and extending postero-laterally; fringe of hairs at pronotal base.

Scutellum submerged, not visible.

Elytra 1.6 times as long as pronotum, 1.3 times as long as its own width; each basal margin feebly outcurved at the level of interstriae 3 and 4, and fringed with hairs; lateral sides subparallel upto two-thirds, then converging posteriorly with narrowly rounded apex; postero-lateral margins distinctly carinate and confluent with interstria 7; discal striae feebly impressed, marked by distinct shallow punctures; interstriae flat at base, but gradually feebly convex towards declivity with sparse minute punctures; interstriae 1, 2 and 3 with a few microhairs at the summit of declivity. Declivity commencing almost at the middle, surface opaque and uneven, comparatively flat on lower half; striae well marked with small punctures, striae 1 and 2 becoming confluent just below the summit of declivity and then again separated; interstria 1 weakly elevated and widening towards apex with minute granules in

rows; interstria 2 obsolete on and near the summit, interstria 3 onwards upto 6 acutely raised from the commencement of declivity upto lower half and marked by rows of small close granules appearing like carinae; interstria 4 forming the highest ridge, gradually sloping and narrowing posteriorly, and extending beyond the upper half of declivity.

*Male* : Unknown.

*Distribution* : INDIA : *Madhya Pradesh* : Balaghat, Maihar and Pachmari; *West Bengal* : Jalpaiguri Dist. : Rajabhatkhawa. ELSEWHERE : Tonkin.

*Hosts* : *Eugenia jambolana* and *Shorea robusta*.

*Remarks* : The species *M. elegans* described by Sampson (1923) from North Bengal, is a rare species in the area although subsequently reported from other parts of India (Madhya Pradesh) and even beyond Indian limit upto Tonkin. Biology of the species is known to the extent of two host records only.

## 25. *Coptodryas mus* (Eggers) (Fig. 31)

### 1. *Xyleborus mus* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 27-28, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Chittagong Hill tract, Sitapahar, Bangladesh.

1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 74.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 308 p.

1987b. Saha and Maiti, *Rec. zool. Surv. India*, 8 (3-4) : 72-73, Male, Fig. 1.

### 2. *Microperus mus* (Eggers)

1984 Saha and Maiti, *Rec. zool. Surv. India*, 81 (3-4) : 3.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 824, 826.

### 3. *Coptodryas mus* (Eggers)

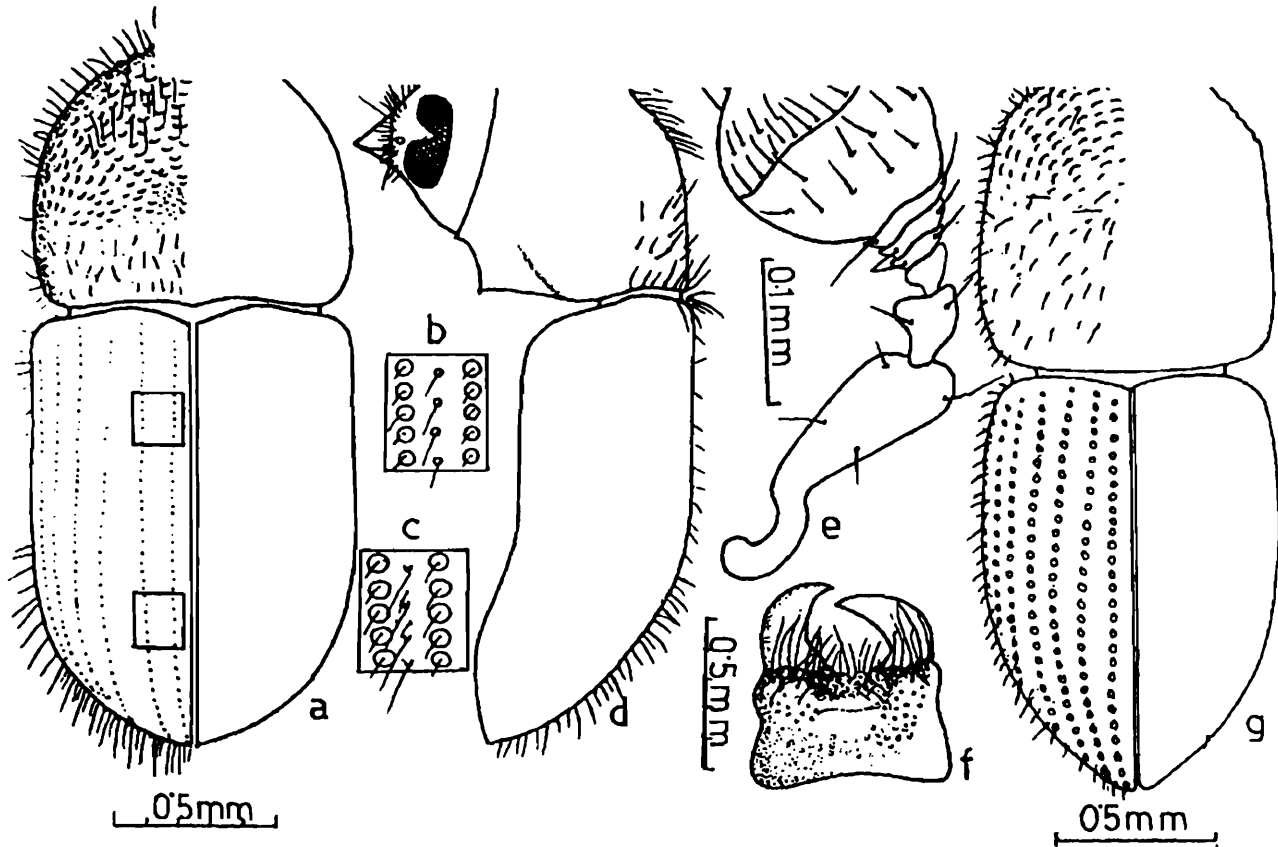
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 825.

*Description* : *Female* : Body small and cylindrical; elytra very shiny; head and elytra deep reddish brown; pronotum, legs and antennae rather paler. Body length 2.25-2.30 mm, 2.5 times as long as wide.

Frons plano-convex, surface distinctly reticulate with granules and long recumbent hairs and with a few shallow punctures towards vertex. Antennal scape long, basal corneous portion of club on its anterior face with weakly procurved non-costate apical margin with one more suture above it; posterior face with one distinct suture apically.

Pronotum about 1.09 times as wide as long; basal margin weakly bisinuate; lateral sides feebly outcurved on basal half, anterior margin narrowly rounded accommodating 4-6 small asperities; summit distinct and placed below the middle; anterior two-thirds with distinct asperities; posterior surface dull and rugose with granules becoming denser towards basal margin; entire surface with long hairs, becoming smaller and thicker towards posterior margin.

Scutellum submerged.



**Fig. 31** : *Coptodryas mus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, head, pronotum and elytra in lateral view; Male : e, antenna; f, head in dorsal view showing sickle shaped mandibles; g, pronotum and elytra in dorsal view.

Elytra 1.6 times as long as and nearly as broad as pronotum, 1.6 times as long as its width; basal margin outcurved at the level of interstriae 3 and 4 and without any scuteller emargination; lateral sides straight on basal half, then gradually converging posteriorly, terminating into a narrowly rounded apex; elytral disc very smooth and shiny; striae marked by shallow punctures placed distantly, each with a microhair; interstriae flat, smooth, 2-3 times wider than striae with single row of sparse minute punctures and erect hairs. Declivity gradual and commencing just behind the middle; face convex; postero-lateral margins round; striae rather marked by distinct punctures; interstriae feebly convex, gradually narrowing towards apex with uniseriate long setaeferous granules and comparatively long and recumbent hairs.

*Male* : Male is very similar to female in pronotal and elytral characters, except in variation of size, but head is different from that of female. Head not concealed from above by pronotum; frons convex, anterior part of frons and epistomal area acutely depressed, either side of which on lateral margins with two rounded swellings amongst profuse long erect hairs, surface weakly roughened. Mandible fairly large, sickly-shaped, inner margin devoid of any tooth.

*Distribution* : INDIA : *Sikkim* : North Sikkim, Fatak (near Mamring). *West Bengal* : Darjiling Dist., Samsing. ELSEWHERE : Bangladesh.

*Hosts* : *Gmelina arborea* and *Michelia champaca*.

*Remarks* : The species has recently been reported by Saha and Maiti (1984 and 1987) from the Sikkim and Darjiling Himalaya, prior to which it was only known from Chittagong hill tracts, Bangladesh. It is known to be associated with two host plants, namely, *Gmelina arborea* and *Michelia champaca*. This species is closely allied to *M. chrysophylli* (Eggers), but differs in having smaller striae punctures throughout, but lacking any sculpture and narrowly rounded elytral apex.

## 26. *Coptodryas perparvus* (Sampson)

(Fig. 32)

### 1. *Xyleborus perparvus* Sampson

1922. Sampson, *Ann. Mag. nat. Hist.*, **9** (9) : 151, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Kurseong Division, West Bengal, India.
1930. Beeson, *Indian Forest Rec. (Ent.)*, **14** (10) : 76.
1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 308 p.
1961. Browne, *Malaya. Forest Rec.*, No. 22, p. 118-119.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 610-611.

### 2. *Coptodryas perparvus* (Sampson)

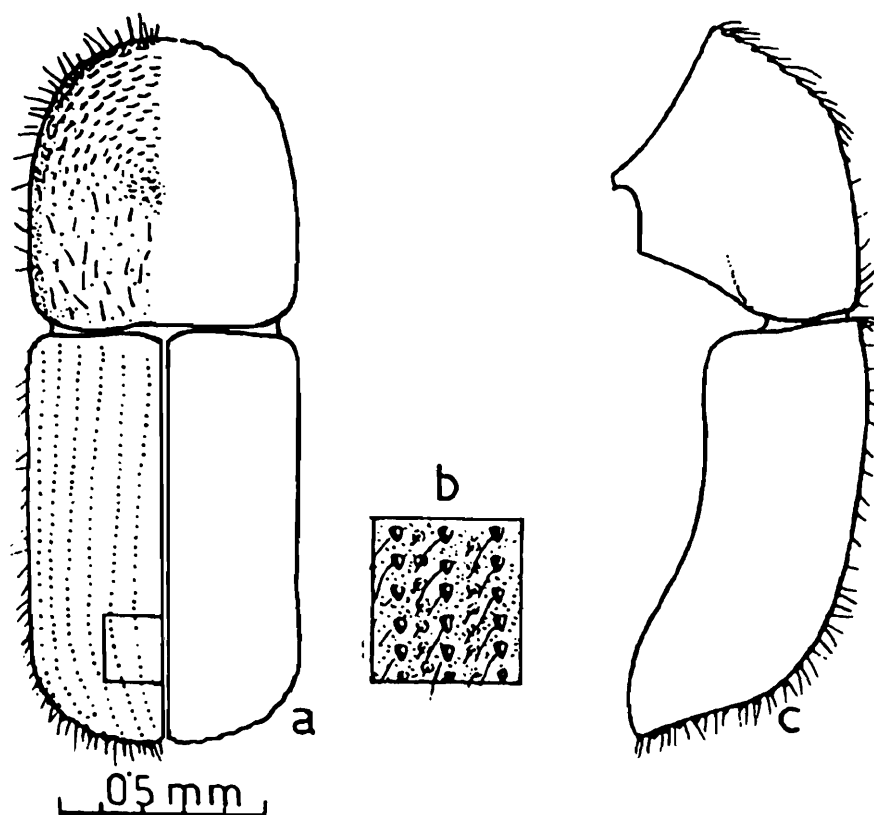
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 826.

### 3. *Microperus perparvus* (Sampson)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 97-98.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 824, 826-827.

*Description : Female* : Body small and cylindrical; head and pronotum deep brown, and elytra blackish brown; antennae and legs light brown. Body length 1.70-1.78 mm, 2.70 times as long as broad.

Frons rugosely reticulate with scattered punctures; median line indistinctly marked; hairs inconspicuous except epistomal margin. Eyes elongately oval with weak emargination. Antennal club with basal corneous portion reduced on anterior face,



**Fig. 32 :** *Coptodryas perparvus* (Sampson), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral declivity; c, pronotum and elytra in lateral view.

apical margin recurved and not costate, and one more suture above it; posterior face marked by single suture apically.

Pronotum 1.20 times as long as wide; postero-lateral angles broadly rounded, lateral sides subparallel; anterior margin broadly rounded and unarmed; summit indistinct; anterior half with distinct transverse asperities and with a few scattered erect hairs; posterior half smooth and shiny with sparse minute punctures and hairs.

Scutellum submerged and not visible.

Elytra 1.66 times as long as its width, 1.46 times as long as pronotum and as wide as pronotum; basal margin feebly outcurved at the level of interstriae 3 and 4, and without any scutellar emargination; lateral sides straight and subparallel upto declivity margin; postero-lateral margins not carinate, but with distinct granules and small hairs; elytral disc coarse and convex; discal striae not at all impressed, only marked by small and shallow punctures, each with an indistinct microhair; interstriae flat, much wider than striae with indistinct granules. Declivity abrupt and steep, and commencing almost on apical fourth; face opaque and plano-concave medially; striae 1, 2 and 3 somewhat distinct marked by large but indistinct punctures without any distinct margins but granulately sculptured within and each with a microhair; stria 1 fairly depressed; interstriae with single row of very distinct granules and hairs. Procoxae contiguous, protibiae with 5 and both meso- and meta-tibiae with 8 teeth.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Cachar Dist., Halflong. *Andaman Island* : North Andaman. *West Bengal* : Darjiling Dist., Sukna and Tista Valley; Jalpaiguri Dist., Buxa, Lower Tondu Range and Rajabhatkhawa. ELSEWHERE : Bangladesh, Myanmar, Indonesia (Borneo) and Malaysia.

*Hosts* : *Canarium euphyllum*, *Chrysophyllum roxburghii*, *Pentacme suavis* and *Shorea robusta*.

*Remarks* : The species *Xyleborus perparvus* with all its essential morphological characters comes under the genus *Coptodryas*, except having declivital face flatly concave which can be considered as individual species characteristics. It can be easily differentiated from all other *Coptodryas* from India, by indistinct strial punctures marked on declivital face and with distinct tubercles on postero-lateral margins. It is recorded from number of host species (Beeson, 1941) from different parts of the Orient infesting small wooden poles and branches of felled trees.

### 27. *Coptodryas recidens* (Sampson)

#### 1. *Xyleborus recidens* Sampson

1923. Sampson, *Ann. Mag. nat. Hist.*, **11** (9) : 287, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Khariabandar, Jalpaiguri Dist., West Bengal, India.
1961. Browne, *Malay Forest Rec.*, No. 22, p. 150.
1975. Schedl, *Arbeitsgem osterr. Ent.*, **27** : 34.

#### 2. *Microperus recidens* (Sampson)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No.* 86 : 98-100.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 824 and 827.

#### 3. *Coptodryas recidens* (Sampson)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 827.

#### 4. *Xyleborus minusculus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 212, Female, *Type-locality* : Engano, Philippines.
1961. Browne, *Malay Forest Rec.*, No. 22, p. 150 (Synonymy).

#### 5. *Xyleborus crassitarsus* Schedl

1936. Schedl, *J. fed. Malay. St. Mus.*, **18** : 28-29. Female, *Type-localities* : South-East and North Borneo.
1955. Browne, *Sarawak Mus. J.*, **6** : 354 (Synonymy).

*Description* : *Female* : As regards the morphological characters, the species is very close to *C. alpha* (Sampson), except the flat declivital face somewhat abruptly sloping and interstria 1 with a single distinct tubercle.

**Distribution** : INDIA : *Andaman Island* : North and Middle Andamans. *West Bengal* : Jalpaiguri Dist., Lower Tondu, Apalchand Range and Buxa. ELSEWHERE : Bangladesh, Myanmar, Indonesia (Borneo and Java), Malaysia, Philippines, China and New Guinea.

**Hosts** : *Albizia lebbek*, *Shorea robusta*, *Terminalia bialata*.

**Remarks** : This is a fairly well distributed species in the Orient and is very close to *C. alpha*. The characteristic abrupt declivity with flat surface and declivital interstria 1 with a single tubercle, is less convincing characters to isolate it from *C. alpha*. These characters may vary in individual beetle. As such, it may be synonymised with *M. alpha* in the near future. However, no definite discussion could be made due to lack of type material, but to maintain its specific status as such at the moment. A few host-plants is known, beyond which any biological information is lacking (Beeson, 1930 and 1941)

**28. *Coptodryas undulatus* (Sampson)**  
(Fig. 33)

**1. *Xyleborus undulatus* Sampson**

1919. Sampson, *Ann. Mag. nat. Hist.*, 4 (9) : 113, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Rajabhatkhawa, West Bengal, India.

1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (9) : 86.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 310 p.

**2. *Coptodryas undulatus* (Sampson)**

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 827.

**3. *Microperus undulatus* (Sampson)**

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 824 and 827.

**Description** : *Female* : Body short and stout; head, pronotum and elytra yellowish brown. Body length 1.88 mm, 2.1 times as long as wide.

Frons plano-convex, surface finely reticulate with sparse shallow punctures and hairs, devoid of any median line. Antennal scape short and stout, on anterior face, basal corneous portion of club with weakly procurved apical margin but not costate and one more suture above it; posterior face with a single suture apically.

Pronotum as long as wide, lateral sides subparallel upto basal two-thirds, anterior margin broadly rounded and unarmed; summit distinct and placed just above the middle; anterior declivous portion with weak transverse asperities and erect hairs; posterior half finely reticulate with indistinct granules and punctures, and sparse hairs, more distinct laterally.

Scutellum not visible.

Elytra 1.4 times as long as pronotum and its own width; each basal margin of elytra weakly outcurved at the level of interstriae 3 and 4; lateral sides subparallel upto basal half, then slightly wider, apex broadly rounded; basal narrow strip of elytral disc smooth with indistinct punctures, beyond that, the disc becoming depressed upto centre and convex towards declivital summit; striaal punctures becoming granulate; interstriae also with uniseriate granules becoming gradually larger towards declivity and each with a long erect hair. Declivity commencing on posterior one-third; face weakly convex and feebly depressed along striae and interstriae 1 and 2; postero-lateral margins weakly carinate but elevated and extending upto interstria 7; striaal punctures close, shallow and each with a microhair, but devoid of any granule as on disc; striae 1 and 2 reaching upto apex, others almost obsolete in lower half of declivity; interstriae 1, 3, 4 and 5 elevated with a few distinct tubercles and also granules, each with a long erect hair; interstria 2 narrow, devoid of any distinct granule or tubercle.

*Male* : Unknown.

*Distribution* : INDIA : West Bengal : Jalpaiguri Dist., Rajabhatkhawa and Garumara.  
ELSEWHERE : None.

*Host* : *Shorea rousta*.

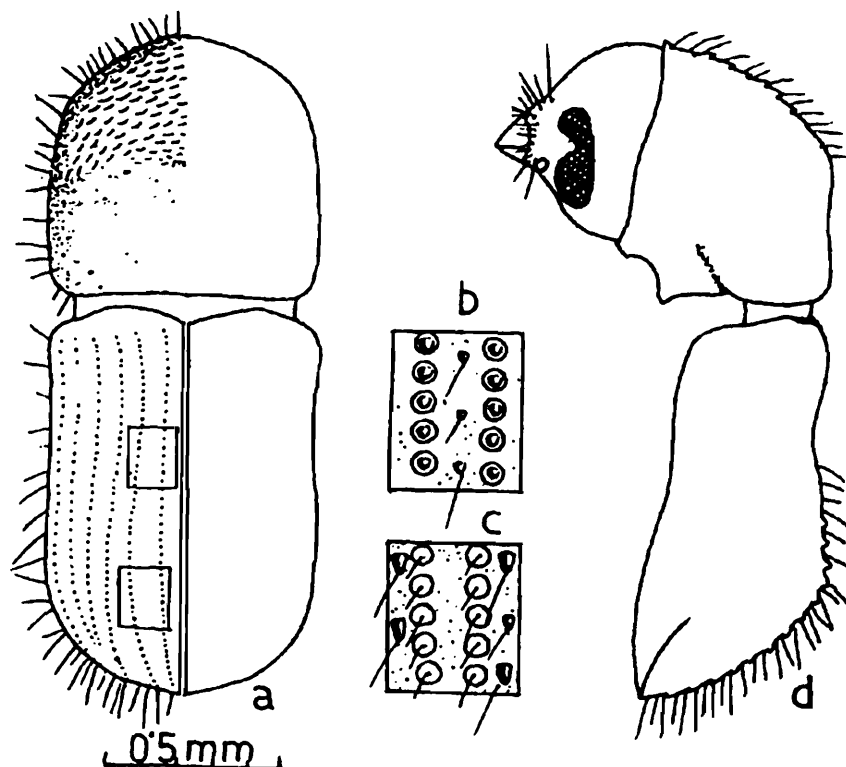


Fig. 33 : *Coptodryas undulatus* (Sampson), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, head, pronotum and elytra in lateral view.

*Remarks* : This is a very distinct species in having shaddle back elytral disc and discal punctures bearing granules. Biological information restricts to a borer of a single host, *Shorea robusta* (Beeson, 1930).

### Genus *Cryptoxyleborus* Schedl

#### 1. *Cryptoxyleborus* Schedl

1937. Schedl, *Sarawak Mus. J.*, 4 : 350.  
 1961. Browne, *Malay Forest Rec.*, No. 22, p. 183.  
 1961. Schedl, *Rev. Ent. Mosc.*, 5 (1) : 102 (Synonymised under *Xyleborus*)  
 1980. Wood, *Gt. Basin Nat.*, 40 (1) : 96.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 828.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 811.

*Type of genus* : *Cryptoxyleborus* : *C. naevus* Schedl.

The genus *Cryptoxyleborus* was erected by Schedl (1937) and number of *Xyleborus* species was transferred to it. The genus was based on strongly compressed antennal club with two procurved sutures on anterior face, scutellum visible only on anterior declivous portion of elytral base and strongly tapering elytral apices. Out of two species so far known from India, *C. turbineus* (Sampson) has been dealt here and the other, *C. subnaevus* Schedl, not included due to lack of material. The representatives of the genus are mostly associated with *Depterocarpus* plants (Browne, 1961).

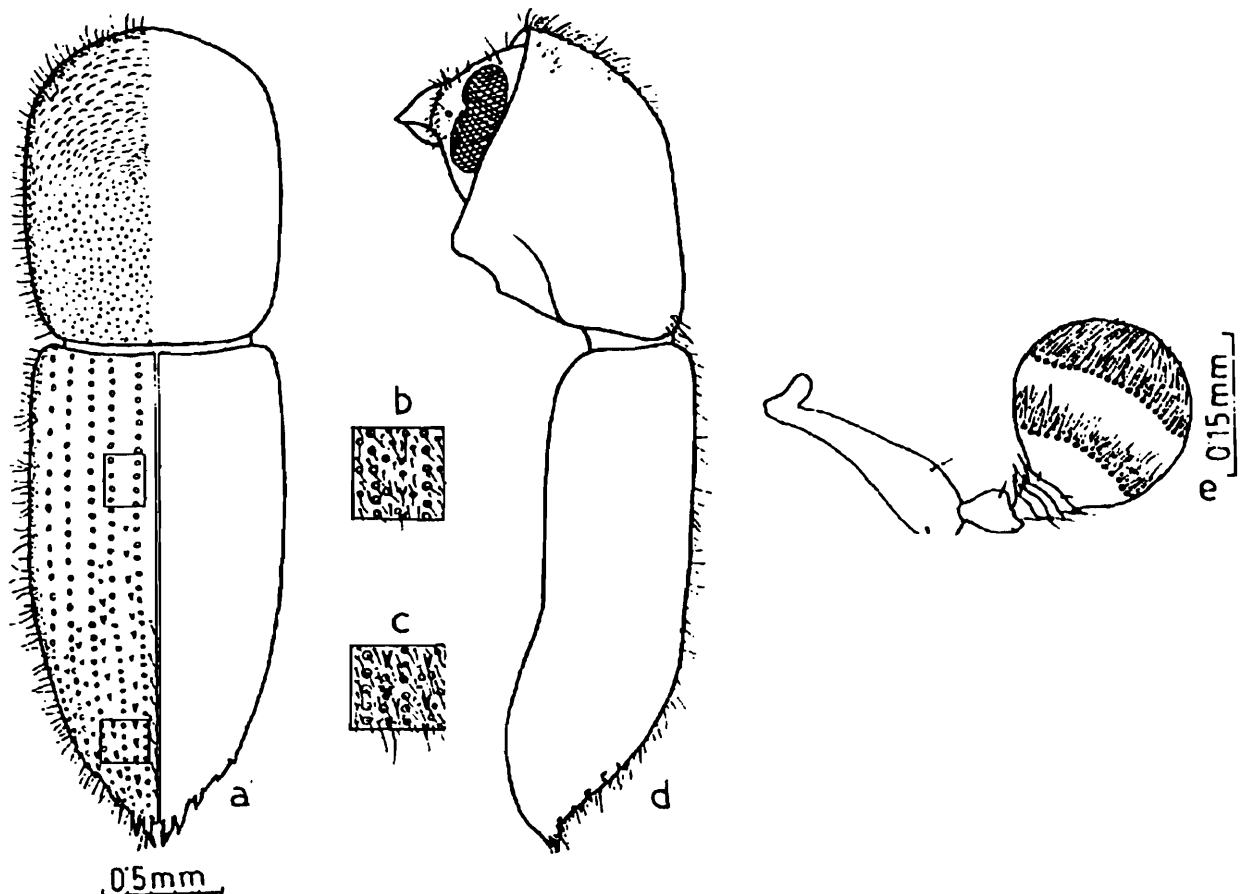
#### 29. *Cryptoxyleborus turbineus* (Sampson) (Fig. 34)

##### 1. *Xyleborus turbineus* Sampson

1923. Sampson *Ann. Mag. nat. Hist.*, 11 (9) : 288, *Holotype* : Male in F.R.I., Dehra Dun. (1 Female at F.R.I., 1 Female Cotype and 1 Female Metatype at Wien Mus.). *Type-locality* : Rajabhatkhawa, West Bengal, India.  
 1927. Eggers, *Treubia*, 9 : 407.  
 1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 86.  
 1973. Schedl, *Revue suisse Zool.*, 82 (3) : 452.  
 1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, 35 : 75.

##### 2. *Cryptoxyleborus turbineus* (Sampson)

1937. Schedl, *Sarawak Mus. J.*, 4 : 551.  
 1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 286 p.



**Fig. 34 :** *Cryptoxyleborus turbineus* (Sampson), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, head, pronotum and elytra in lateral view; e, antenna.

1975. Beaver and Browne, *Oriental Ins.*, **9** (3) : 289.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 829.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 811, fig. 13, a-e.

**Description : Female :** Body cylindrical, tapering towards apex and densely hairy; colour reddish brown. Body length 3.15 mm, nearly 3.3 times as long as wide.

Frons plano-convex, median line distinct; surface finely reticulate with minute punctures and long erect hairs. Eyes elongately oval and feebly emarginate. Antennal scape long and slender; funicle with 5 segments; club dorso-ventrally flattened; anterior face with two procurved sutures and posterior face with one procurved suture apically, generally marked by hairs.

Pronotum 1.3 times as long as wide; basal margin substraight, lateral sides subparallel but widest at anterior one-third, anterior margin broadly rounded and unarmed; summit indistinct; anterior one-third with minute asperities and with dense coat of hairs; posterior two-thirds with large distinct punctures and devoid of any hair except laterally.

Scutellum visible on the anterior declivous portion of elytral base, not teaching the surface level of elytra.

Elytra 1.5 times as long as pronotum; 1.9 times as long as its width; basal margin substraight, lateral sides subparallel on basal half, thence converging posteriorly and terminating into a strong acute apex; discal striae marked by shallow, close punctures, each with a microhair; striae comparatively impressed; interstriae much wider than striae with irregular distinct punctures and small hairs; interstria 2 with granules from basal third and interstriae 3 from the middle. Declivity commencing on posterior one-third; face slanting; strial punctures as on disc; interstria 1 narrow, with indistinct granules; rest of the interstriae with pointed uniseriate tubercles, gradually decreasing in size towards laterally, those on interstriae 2 and 3 comparatively large; each elytral apex with a pointed large spine.

*Male* : Male is similar to female, but differs as follows : Body length 2.30 mm; frons coarsely punctate and deep longitudinal impression in the middle; anterior half densely pubescent.

Pronotum subrectangular, 2.25 times as long as its width; basal margin substraight, lateral sides weakly diverging anteriorly, antero-lateral angles broadly rounded, anterior margin substraight; anterior declivous one-third with weak asperities, posterior two-thirds shiny with somewhat dense setaeferous punctures.

Elytra 1.3 times as long as pronotum; interstriae and striae 1 and 2 impressed from the commencement of declivity to just before apex; depressed area with comparatively long hairs and with larger interstitial tubercles; striae prominent on lateral sides.

*Distribution* : INDIA : *Bihar* : Singhbhum; *West Bengal* : Jalpaiguri Dist., Rajabhatkhawa and Buxa. ELSEWHERE : Myanmar, Malaysia; Philippines; North Vietnam and Thailand.

*Hosts* : *Pentacme suavis* and *Shorea robusta*.

*Remarks* : The pointed elytral apices of this widely distributed species in the Orient, serve as the distinctive feature of the species. In the original description, Sampson (1923) did not clearly mention whether the description was based on male or female. It appears that the author had described probably the female. But, the Holotype designation by the author now preserved in F.R.I., Dehra Dun, is represented by a male, the assignment of which will be a female beetle. However, the description of the male is provided here for the first time.

### Genus *Cyclorhipidion* Hagedorn

#### 1. *Cyclorhipidion* Hagedorn

1912. Hagedorn, *Dt. ent. Z.*, 1912 : 355.

## 2. *Terminalinus* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Bur. Ent. Tech. Bull.*, **17** (2) : 10, 57.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 697.

## 3. *Kelantanius* Nunberg

1961. Nunberg, *Ann. Mag. nat. Hist.*, **3** (13) : 621.  
 1978. Wood, *Annals. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.  
 1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96.  
 1986. Wood, *Gt. Basin Nat. Mem.*, **10** : 83 (Synonymy).  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 697.

*Type of genera* : *Cyclorhipidion* : *C. pelliculosus* Hagedorn, *Kelantanius* : *Xyleborus punctatopilosus* Schedl, *Terminalinus* : *T. terminaliae* Hopkins.

*Kelantanius* had emerged as a distinct genus (Nunberg, 1961) from *Xyleborus* and subsequently the genus was merged under it (Wood, 1978). However, it was finally established by Wood (1980) as a valid one. The genus as we conceive today, is characterized in having rounded elytral postero-lateral margins, antennal club with elevated apical margin forming a complete ring, body comparatively densely hairy and somewhat ovoid pronotum with armed anterior margin. Following the characteristic features of the genus, Saha and Maiti (1996) had transferred 7 species of *Xyleborus* to the genus *Kelantanius*. Four more species, namely, *X. distinguendus* Eggers, *X. longidens* Eggers, *X. mussooriensis* Eggers and *X. sulcatus* Eggers have been transferred to this genus in the present context. Out of these, *K. distinguendus* Eggers and *K. inarmatus* Eggers with its subrectangular pronotum, inconspicuous asperities and less distinct costate apical margin of antennal club, does not exactly fit into the genus. Likewise, all other species, except *X. hirtum*, lacking strictly rounded elytral postero-lateral margins being a good character of the genus, pose some problems of assigning them to the genus *Kelantanius*. But retention of all these species in *Xyleborus* is also unjustified, although Wood and Bright (1992) had assigned these species either in *Xyleborus* or *Ambrosiodmus* (only *Xyleborus sulcatus*). Tentatively all these species have been transferred to the genus *Kelantanius* which has been shruenken under *Cyclorhipidion* by Wood (1986).

Out of these eleven species, three species (*agnatum*, *nutens* and *hirtum*) only have been kept under *Cyclorhipidion* and the rest have been kept under *Xyleborus* and *X. sulcatus* under *Ambrosiodmus* (Wood and Bright, 1992).

However, two species, *C. agnatum* Eggers and *C. nutens* Schedl have not been included in the present account due to lack of material.

### General characters of the genus *Cyclorhipidion* Hagedorn.

*Female* : Body stout and cylindrical, and comparatively densely hairy; body either

uniformly coloured from reddish brown to blackish brown or gradually darker towards elytra. Body length 2.50-4.20 mm and 2.2 to 2.4 times as long as wide.

Frons plano-convex with either distinct or indistinct shiny median line, surface on its either side finely reticulate with either granules or punctures or both and with long fine hairs. Eyes elongately oval and more or less one-third of its width emarginate. Antennal scape either short or long; funicle with 5 segments, but club obliquely truncate, on anterior face basal corneous portion with weakly recurved costate apical margin forming a complete ring; truncate face with two more sutures; posterior face devoid of any suture; in *C. inarmatus* and *C. distinguendus*, club somewhat compressed, on anterior face basal corneous portion reduced with feebly procurved and weakly costate apical margin, posterior face with only one distinct suture apically.

Pronotum generally ovoid, slightly wider than long, anterior margin broadly rounded; transverse summit on or near middle; anterior declivous area with distinct transverse asperities, gradually increasing in size anteriorly interspersed with small asperities, anterior margin with 4-6 distinct asperities, posterior half finely reticulate with distinct sparse granules, gradually obsolete posteriorly; but in *C. distinguendus* and *C. inarmatus* pronotum rather subrectangular, longer than broad, anterior margin unarmed, asperities adpept anteriorly and distinct punctures posteriorly; vestiture of dense fine hairs; sometimes postero-median portion with a tuft of hairs.

Scutellum tongue-shaped.

Elytra 1.5-1.6 times as long as pronotum and nearly 1.2-1.3 times as long as its width; basal margin substraight; lateral sides subparallel on basal half to three-fourths, then slightly wider and again converging posteriorly to broadly rounded apex; discal striae sometimes feebly impressed marked by distinct shallow punctures, each with a microhair; interstriae flat, smooth, generally 2-4 times wider than long, with uniseriate or irregular 2-3 rows of punctures and granulate towards declivity. Declivity commencing on or below the middle; declivital face plano-convex or plano-concave and sometimes impressed along striae 1 and 2 or 1, 2 and 3 (*C. eggersi*); striae with distinct punctures; interstriae sometimes feebly convex and marked by tubercles or granules; entire elytral surface sparsely to densely hairy. Procoxae contiguous, protibiae with 5-6 and meso- and meta-tibiae with 6-11 teeth respectively.

#### **Key to the species of *Cyclorhipidion* Hagedorn based on females**

1. Pronotum subrectangular, distinctly longer than broad with small asperities becoming more inconspicuous posteriorly ..... 2
- Pronotum suboval, broader than long, with large pointed asperities becoming more conspicuous anteriorly ..... 3

2. All the declivital interstriae with granules, smaller species, body length 2.20-2.25 mm ..... *C. inarmatus* (Eggers)
- All the declivital interstriae either with granules or tubercles except on interstria 2; larger species, body length 2.50 mm ..... *C. distinguendus* (Eggers)
3. All the declivital interstriae with only granules of either large or small in size ..... 4
- Declivital interstria 1 devoid of any granule or tubercle, other interstriae (either it is at the commencement of declivity or on declivital face) with either granules or tubercles or spines ..... 6
4. Larger species, body length 4.00-4.20 mm; elytral hairs rather long and erect ..  
..... *C. hirtum* (Hagedorn)
- Smaller species, body length, 2.65-3.00 mm; elytral hairs comparatively small ...5
5. Declivital interstriae with uniseriate granules; declivity commencing from the middle of elytra; postero-median portion of pronotum with tuft of hairs .....  
..... *C. lineatus* (Eggers)
- Declivital interstria 3 feebly elevated, bearing close granules, larger than the granules of other interstriae; declivity commencing on posterior one-third; postero-median portion of pronotum devoid of any tuft of hairs ..... *C. sulcatus* (Eggers)
6. Declivital face somewhat concave, interstriae 2 and 3, each with one long curved spine at the commencement of declivity; interstria 4 elevated with 4 spines forming the upper declivital margin along with the tubercles on interstriae 2 and 3; all the spines bent towards declivity and with number of hairs at the base of each spine; body length, 2.50 mm ..... *C. longidens* (Eggers)
- Declivital face either plano-concave or plano-convex, devoid of any spine, rather with granules or tubercles, each granule or tubercle with a single hair  
..... 7
7. Posterior half of declivital margin not acutely elevated, but distinctly rounded; pronotal asperities quite prominent; body length 3.00 mm .....  
..... *C. improbus* (Samson)
- Posterior half of declivital margin not sharply carinate but somewhat acutely elevated and marked by granules; pronotal asperities prominent, body length 3.00-3.72 mm ..... 8
8. Head and elytra of same colour; declivital margin more sharp and sloping steeply; pronotum with distinct asperities at the anterior portion; elytral disc with microhairs; elytral hairs comparatively smaller; body length 3.00-3.10 mm .....  
..... *C. eggersi* (Beeson)
- Head and elytra of different colour, declivital margin not so sharp and not sloping so steeply, but gradually; pronotal asperities distinctly and comparatively longer; elytral disc without any microhair; elytral hair comparatively larger in size; body length 3.70-3.72 ..... *C. mussooriensis* (Eggers)

30. *Cyclorhipidion distinguendus* (Eggers)1. *Xyleborus distinguendus* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 205-206, *Holotype* : Female, in F.R.I., Dehra Dun. *Type-locality* : Kali Valley, Almora, Uttar Pradesh, India.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 730.

*Description* : *Female* : Body stout and cylindrical; head and pronotum reddish brown, elytra slightly darker; body comparatively densely hairy as in *C. inarmatus*. Body length 2.50 mm.

Frons plano-convex with distinct shiny median line, surface on its either side finely reticulate with fine granules. Eyes elongately oval and less than half of its width emarginate. Antennal scape short; club somewhat compressed; on anterior face, basal corneous portion reduced with feebly procurved and weakly costate apical margin, beyond apical margin with one more complete suture; posterior face only with one distinct suture apically.

Pronotum subrectangular, 1.1 times as long as wide; basal margin substraight, subparallel upto two thirds; anterior margin broadly rounded and unarmed; indistinct summit just above the middle; anterior half with small asperities, gradually decreasing in size posteriorly and also extending feebly postero-laterally; posterior half with distinct punctures; vestiture of dense fine hairs.

Scutellum comparatively small and tongue-shaped.

Elytra 1.5 times as long as pronotum, lateral sides subparallel on basal three-fourths, gradually rounded posteriorly with broadly rounded apex; discal striae marked by shallow close punctures (of irregular shape), each with a microhair; interstriae nearly twice as wide as striae and with fine hairs, punctures or granules inconspicuous. Declivital face somewhat steep; face plano-convex; interstria 1 feebly elevated with 3 small distinct tubercles of unequal size; interstria 2 without any tubercles or granules; interstria 3 also feebly elevated with 3-4 granulate tubercles and of unequal size; striae somewhat curved, distinct, but punctures inconspicuous.

*Male* : Unknown.

*Distribution* : INDIA : *Uttar Pradesh* : Almora, Kali Valley). ELSEWHERE : None.

*Remarks* : The species is very close to *C. inarmatus* and not yet reported from anywhere other than its type-locality in Almora, Uttar Pradesh, India.

31. *Cyclorhipidion eggersi* (Beeson)

(Fig. 35)

1. *Xyleborus eggersi* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* 14 (9) : 215, *Holotype* : Female in F.R.I., Dehra Dun. *Type-localities* : Debrepani, Lopchu and Senchal Range, West Bengal, India.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 304 p.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 732.

## 2. *Kelantanius eggersi* Beeson

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 820, 821.

*Description : Female* : Body stout and densely hairy; head, pronotum and elytra reddish brown to blackish brown. Body length 3.00-3.10 mm, 2.2 times as long as wide.

Frons plano-convex, impressed on either side of distinct or indistinct median line just above epistomal margin; surface finely reticulate, with irregular sparse punctures and long fine hairs. Eyes small, oval and one-third or its width emarginate. Antennal scape long and slender; club obliquely truncate; on anterior face, basal corneous portion with weakly recurved costate apical margin forming a complete ring; truncated face with two more sutures; posterior face devoid of any suture.

Pronotum somewhat ovoid, slightly wider than long; anterior margin broadly rounded; transverse summit just below the middle; anterior declivous area with distinct transverse asperities, gradually increasing in size anteriorly, anterior most row with 4-6 distinct contiguous asperities and interspersed with small asperities and fairly dense erect hairs; posterior half finely reticulate with distinct sparse granules and some fine hairs, gradually obsolete posteriorly.

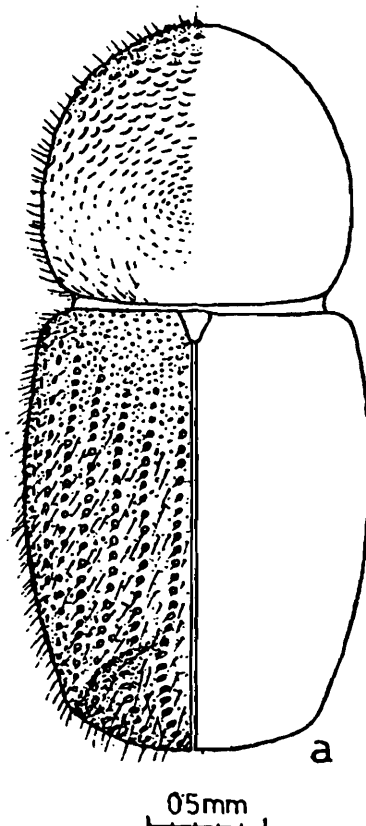


Fig. 35 : *Cyclorhipidion eggersi* (Beeson), Female : a, Pronotum and elytra in dorsal view.

Scutellum tongue-shaped and very shiny.

Elytra 1.5 times as long as pronotum and nearly 1.3 times as long as its width; basal margin substraight; lateral sides subparallel on basal half, then slightly wider and again converging posteriorly to broadly rounded apex; discal striae marked by distinct shallow punctures, each with a microhair; punctures gradually smaller towards basal margin and hardly distinguishable from interstitial punctures; interstriae flat, smooth with irregular distinct small punctures and long erect hairs, distinct towards declivity and laterally. Declivity commencing slightly below the middle, face flat; interstria 4 somewhat acutely elevated and confluent with posterior margin of elytra and somewhat forming the lateral margins of declivity; striae 1, 2 and 3 feebly impressed, punctures rather close and distinct, each with a microhair; interstriae 1 and 2 with small granules at the commencement of declivity and rest with punctures, interstriae 3 and 4 slightly raised with irregular series of granules and a few small tubercles, tubercles rather blunt and less distinct; interstriae with long erect hairs. Procoxae contiguous, pro- and meso-tibiae with 5 and 9 teeth respectively.

*Male* : Unknown.

*Distribution* : INDIA : *West Bengal* : Darjiling Dist. : Debrepani, Lopchu, Senchal Range, Rangirum and Lepchajagat. ELSEWHERE : None.

*Hosts* : *Eriobotyre petiolata*, *Litsea umbrosa*, *Ostodes panikulata*, *Symplocos theaefolia* and *Turpinia nepalensis*.

*Remarks* : The species is closely allied to *X. geminatus* Hagedorn which is characterised in having pair of tubercles on interstriae 1, 2 & 3, as reported by Beeson (1930). In *C. eggersi*, these tubercles are not in pairs, rather irregular in number. The number as well as the size of these tubercles varies considerably in individual specimen. However, *X. geminatus* is no more considered under *Cyclorhipidion*, rather under *Amasa*.

*Cyclorhipidion eggersi* is a good species and so far known to confine only in the fairly high altitudes of the Darjiling Hill ranges. No fresh material has been collected recently, hence the biology of the species remains completely unknown, except the record of some hosts.

### 32. *Cyclorhipidion hirtum* (Hagedorn)

(Fig. 36)

#### 1. *Xyleborus hirtum* Hagedorn

1904. Hagedorn. *Bull. Mus. Hist. nat. Paris*, p. 126, Female : *Type locality* : Darjiling, West Bengal, India.

1910. Hagedorn, *Coleopt. Cat.*, 26 (1) : 105.

#### 2. *Kelantanius hirtum* (Hagedorn)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 820-822.

### 3. *Cyclorhipidion hirtum* (Hagedorn)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 700.

### 4. *Xyleborus hagedorni* Stebbing

1914. Stebbing, *Indian Forest Insects (Coleopt.)* : 596 p., *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Tharrawaddy, Myanmar.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 821 (Synonymy).

### 5. *Xyleborus hagedornianus* (nom. nov. of *Xyleborus hagedorni*)

1951/52. Schedl, *Ent. Baltt.*, 47/48 : 16.

### 6. *Xyleborus tectonae* (nom. nov. of *Xyleborus hagedorni*)

1956. Schedl, *Ann. Zool. Warsaw*, 16 : 207 and 214.

### 7. *Xyleborus hirtuosus* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* 14 (10) : 217 and 238, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Lapchu and Senchal Range, West Bengal and Shillong, Meghalaya.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 821 (Synonymy).

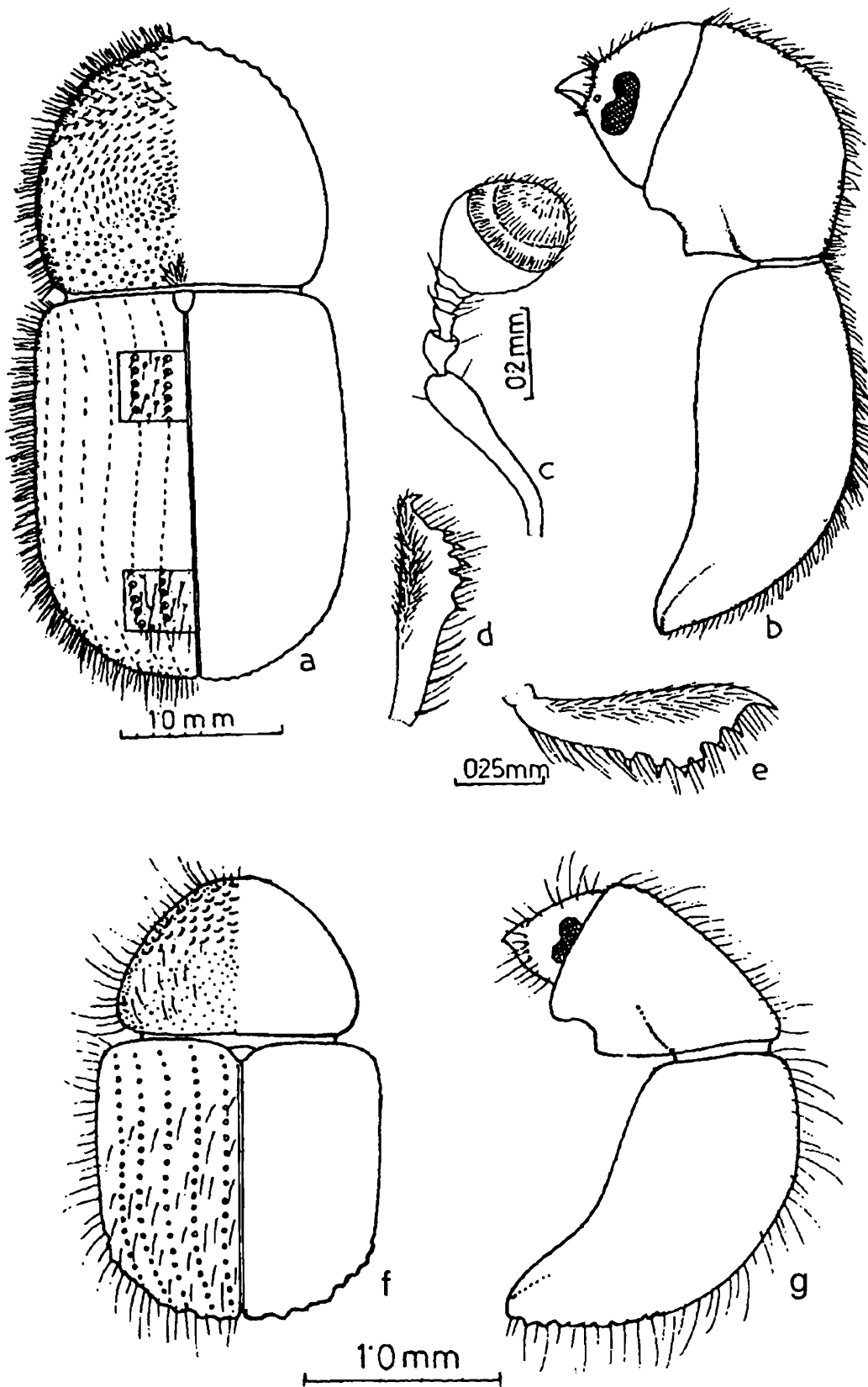
*Description : Female* : Body stout and densely hairy; head light yellowish brown, pronotum and elytra reddish brown to complete black. Body length 4.00-4.20 mm, 2.3 times as long as wide.

Head globose; frons plano-convex, surface finely reticulate, with indistinct median line and sparse but distinct punctures; a few granules towards epistomal margin; entire surface with sparse long erect hairs; two small yellowish white spots on either side just above epistomal margin. Eyes elongately oval and feebly emarginate. Antennal scape long and slender; club obliquely truncate, on anterior face, basal corneous portion with recurved costate apical margin, forming a complete ring; truncate face with one distinct suture and posterior face devoid of any suture.

Pronotum ovoid, 1.1 times as wide as long, with less outcurved basal margin; anterior margin with a few asperities; dorsum strongly convex, summit below the middle; anterior declivous portion with distinct transverse asperities and with minute asperities between them; posterior portion finely reticulate with sparse minute punctures; entire pronotal surface sparsely to densely hairy, and its postero-median portion with a tuft of hairs.

Elytra tongue-shaped and distinctly longer than broad.

Elytra 1.6 times as long as pronotum, 1.2 times as long as its width and distinctly wider than pronotum; basal margin subs-raight, lateral sides subparallel on basal three-fourths; postero-lateral sides broadly rounded and lines with granules; discal stria marked by close distinct punctures, each with microhair; interstriae 3-4 times wider than striae with irregular row of setiferous punctures, granulate towards declivity. Declivity commencing below the middle, declivital face plano-convex but



**Fig. 36 :** (a-e) *Cyclorhipidion hirtum* (Hagedorn), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna; d, protibia; e, mesotibia; (f-g) *Cyclorhipidion hirtum* (Hagedorn), Male : f, Pronotum and elytra in dorsal view; g, head, pronotum and elytra in lateral view.

sometimes impressed along striae 1 and 2; striae with distinct punctures, each with a microhair; interstriae feebly convex and marked by granules; entire elytral surface sparsely to densely hairy. Procoxae contiguous, protibiae with 5 and both meso- and meta-tibiae with 6 teeth.

*Male* : Body moderate in size, blackish in colour, slightly paler towards pronotum and head; head concealed under pronotum. Pronotum subquadrate, basal margin substraight; lateral margin outcurved and widest at the middle; anterior margin broadly rounded; in profile, dorsal surface convex and provided with distinct asperities.

Elytra nearly as wide as pronotum, slightly longer than wider basal margin of each elytron moderately outcurved; lateral margins subparallel upto middle; striae moderately impressed; interstriae with small and shallow punctures; entire surface moderately hairy.

*Distribution* : INDIA : *Meghalaya* : Shillong. *West Bengal* : Darjiling Dist. : Debrepani, Ghum, Lopchu, Rangirum and Senchal Range. ELSEWHERE : Myanmar and Taiwan.

*Hosts* : *Beilschiiedia sikkimensis*, *Evedia fraxinifolia* and *Sympocos theaefolia*.

*Remarks* : The species, *Cyclorhipidion hirtum* was originally described as *Xyleborus hirtus* by Hagedorn from the Darjiling Hill Ranges. Two species, namely, *Xyleborus hagedorni* Stebbing from Myanmar and *X. hirtuosus* Beeson from Shillong and Darjiling, have been synonymised under it for the first time in the present study. However, two more species, namely *X. hagedornianus* and *X. tectonae* which were actually the new names of *X. hagedorni*, also automatically became the synonymy of the species. In fact, on the basis of weak asperities on the pronotum, Stebbing (1914) established his species *X. hagedorni*, but this character seemed to vary in some material of the same colony as revealed in the present study. Likewise, *X. hirtuosus* differentiated on the basis of frontal punctures and pronotal asperities (armed with 7-8 asperities) also does not stand valid as a separate species. The hairiness of pronotum and impressed declivital face along the striae and interstriae 1 and 2, varies considerably from specimen to specimen. The colour also varies considerably from yellowish brown to complete black. However, Prof. S. L. Wood is also in agreement of synonymising the species *Xyleborus hagedorni* and *Xyleborus hirtuosus* with *Cyclorhipidion hirtum* (pers. com.).

Stebbing (1914) studied the biology of the species to the extent of host-records, gallery pattern, etc.

### 33. *Cyclorhipidion improbus* (Sampson)

(Fig. 37)

#### 1. *Xyleborus improbus* Sampson

1913. Sampson, *Ann. Mag. nat. Hist.*, 7 (9) : 444, *Holotype* : Female, deposited in F.R.I., Dehra Dun. *Type-locality* : Darjiling, West Bengal, India.

1914. Stebbing, *Indian Forest Insects (Coleopt.)*, 600-601 pp.

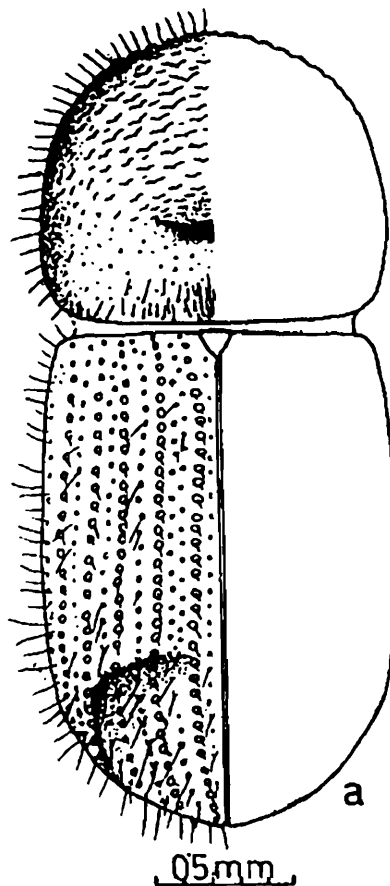
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 744.

2. *Kelantanius improbus* (Sampson)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B) : 820.*

*Description : Female* : Body short, stout and densely hairy; head, pronotum and elytra deep brown, but elytra more darker, legs and antennae paler. Body length 3.00 mm, about 2.4 times as long as wide.

Frons plano-convex and pilose, impressed on either side of weakly elevated median line just above epistomal margin; surface finely reticulate with sparse punctures of irregular shape, becoming more sparse and small towards vertex. Eyes oval and less than half of its width emarginate. Antennal scape long and slender; club obliquely truncate; on anterior face, basal corneous portion reacting upto half of the club with recurved costate margin forming complete ring; truncate face with two recurved sutures; posterior face devoid of any suture.



**Fig. 37** : *Cyclorhipidion improbus* (Sampson), Female; a, Pronotum and elytra in dorsal view.

Pronotum somewhat ovoid, 1.1 times as wide as long; basal and lateral sides feebly outcurved; anterior margin broadly rounded with contiguous asperities; distinct transverse summit below the middle; anterior half with distinct close asperities gradually becoming less transverse and more prominent anteriorly and anterior. Most row slightly below the anterior margin with 7-8 contiguous asperities; posterior half somewhat shiny with scattered minute punctures; vestiture of long erect hairs, more distinct towards basal margin.

Scutellum triangular in shape.

Elytra 1.6 times as long as pronotum and 1.4 times as long as its width; basal margin substraight; lateral sides subparallel on basal three-fourths, gradually narrowing posteriorly with broadly rounded apex; discal striae gradually more impressed towards declivity, punctures close and large, each with a microhair; interstriae smooth, shiny with distinct punctures having erect hairs. Declivity commencing below the middle, postero-lateral margins rounded; face weakly convex; striae distinctly outcurved at the declivital face and more impressed than those on disc, punctures large and more close, each with a microhair, interstriae 3 and 4 feebly elevated, with uniseriate granules and long erect hairs; hairs those on declivital face comparatively long; interstria 2 with one small granule just at the commencement of declivity. Procoxae contiguous; protibiae with 6 and both meso- and metatibiae with 8 teeth.

*Male* : Unknown.

*Distribution* : INDIA : West Bengal : Darjiling Dist : Sanchal Range and Lepchajagal. ELSEWHERE : None.

*Hosts* : *Eucalyptus globulus*, *Machilus odoratissima* and *Quercus lamellosa*.

*Remarks* : The species *Cyclorhipidion improbus* is a very uncommon species so far known only from its type-locality only. It has been recorded as a borer of *Eucalyptus globulus* and saplings of *Machilus odoratissima* and *Quercus lamellosa* from the high altitude of Darjiling hills (Beeson, 1930 and 1941).

### 34. *Cyclorhipidion inarmatus* (Eggers)

(Fig. 38)

#### 1. *Xyleborus inarmatus* Eggers

1923. Eggers, *Zool. Meded.*, 7 : 209, Type Female (4) in Mus. Civic. Genova. *Type-localities* : Sumatra, Indonesia; Tenasserim and Carincheba, Myanmar..

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 744.

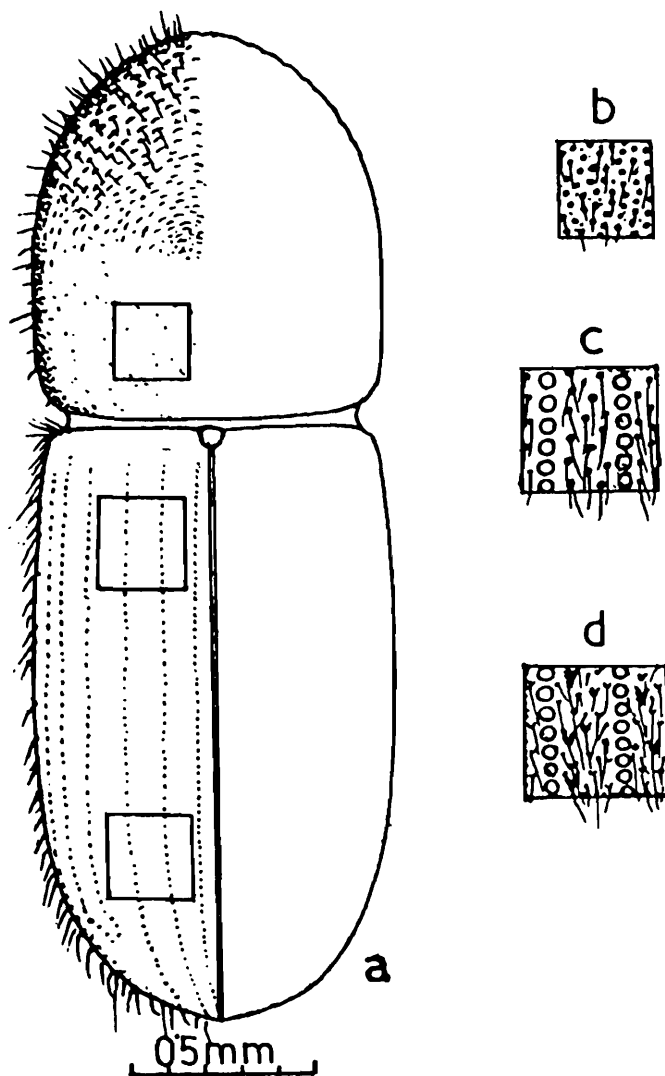
#### 2. *Kelantanius inarmatus* (Eggers)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 820, 822.

*Description* : *Female* : Body long and cylindrical; colour yellowish brown, elytra comparatively darker. Body length 2.20-2.25 mm, 2.2 times as long as wide.

Frons weakly convex and devoid of any median lines; surface finely reticulate, upper half with irregular deep punctures and lower half with minute granules and fine hairs. Eyes, antennae, pronotum and scutellum as in *C. distinguendus*.

Elytra 1.5 times as long as pronotum and 1.6 times as long as its width; basal margin substraight, lateral sides subparallel nearly upto two-thirds, converging posteriorly with broadly rounded apex; discal striae feebly impressed, marked by



**Fig. 38 :** *Cyclorhipidion inarmatus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of pronotum; c, enlarged portion of elytral disc; d, enlarged portion of elytral declivity.

shallow punctures, each with a microhair; interstriae flat much wider than striae with irregular granules and fine hairs. Declivity commencing on posterior third, face convex; striae distinctly impressed with distinct small punctures, each with a microhair; interstriae feebly elevated with irregular minute granules and dense hairs.

*Male* : Unknown

*Distribution* : INDIA : *West Bengal* : Lopchu; *Himachal Pradesh* : Simla Hill.  
ELSEWHERE : Myanmar and Indonesia (Sumatra).

*Host* : *Quercus lamellosa*.

*Remarks* : The species is known so far to occur only in the hilly tracts of the Himalaya to Sumatra via Burmese Tenasserim ranges. *Quercus lamellosa* is the only host known from Lopchu, Darjiling Hill range (Beeson, 1930 and 1941).

35. *Cyclorhipidion lineatus* (Eggers)  
(Fig. 39)

1. *Xyleborus lineatus* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 1 and 2, *Holotype* : Female, deposited in F.R.I., Dehra Dun. *Type-localities* : Senchal Range, West Bengal, Chaubattia, Kumaon, Uttar Pradesh, India.
1992. Wood and Bright, *Gt. Basin Nat. Mem., No. 13 (Vol.-A)* : 744.

2. *Kelantanius lineatus* (Eggers)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 820, 822, 823.

3. *Xyleborus malancranis* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* 14 (10) : 42, 43 and 69, *Type-locality* : Lapchu and Senchal Range, West Bengal.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 822 (Synonymy).

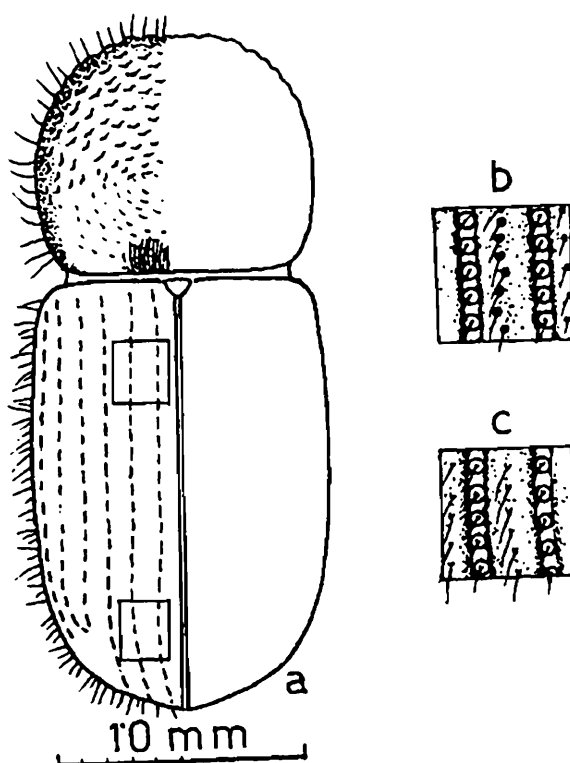
*Description : Female* : Body moderately stout and sparsely hairy; head, pronotum and elytra reddish brown to complete black, pronotum sometimes lighter. Body length 2.65-2.75 mm, 2.3 times as long as wide.

Frons plano-convex, surface finely reticulate, feebly impressed and with distinct punctures on either side of weakly elevated median area, and with sparse long erect hairs. Eyes elongately oval, broadly emarginate upto less than half of its width. Antennal scape short and stout; club obliquely truncate, on anterior face, basal corneous portion reduced with recurved costate apical margin, forming a complete ring; truncated face with another suture; posterior face devoid of any suture.

Pronotum suboval, 1.1 times as wide as long, anterior margin broadly rounded; distinct summit almost at the middle or little being; anterior declivous portion with distinct transverse asperities, gradually increasing in size anteriorly, anterior most row with 6-7 contiguous asperities of almost equal size and also gradually decreasing in size both posteriorly and postero-laterally, interspersed with a few smaller one; posterior portion of summit finely reticulate and dull with scattered granules, obsolete towards basal margin; vestiture of long erect hairs on declivous surface and a tuft of hairs at postero-median area.

Scutellum triangular to tongue-shaped.

Elytra 1.6 times as long as pronotum and 1.4 times as long as its width and slightly wider than pronotum; basal margin substraight; lateral sides subparallel upto two-thirds, posterior margins broadly rounded; postero-lateral margins rounded, devoid of any carina; striae marked by distinct close punctures and 1 and 2 feebly impressed upto apex, punctures obsolete towards basal margin, with irregular single or double rows of shallow small punctures, each with a erect hair. Declivity gradually sloping and commencing nearly from the middle, surface plano-convex, posterior half



**Fig. 39 :** *Cyclorhipidion lineatus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity.

rather steep; stria outcurved at the middle; strial punctures more distinct than on disc; interstriae with uniseriate granules as well as with a few scattered punctures and each with a long hair. Protibiae with 8 and both meso- and meta-tibiae with 10 teeth.

*Male* : Unknown.

*Distribution* : INDIA : *Uttar Pradesh* : Kumaon Hills, Chaubattia : *West Bengal* : Darjiling Dist : Darjiling, Lopchu, Lepchajagat, Rangirum, Senchal Range. ELSEWHERE : None.

*Hosts* : *Alnus nepalensis*, *Machilus edulis* and *Symplocos theaeifolia*.

*Remarks* : Both the species *Xyleborus lineatus* Eggers and *X. malancranis* Beeson were described almost from the same localities of the Darjiling hills in the same year (1930). Beeson (1930) distinguished the latter species by its less impressed striae and uniseriately punctate interstriae, which appeared to be less sound in maintaining the validity of Beeson's species. As such, *X. malancranis* is considered as a synonymy of *X. lineatus* in a recent publication (Saha and Maiti, 1996).

However, the species falls under the group of the species which may readily be separated from the allied ones in having very minute granules on the declivital interstriae in contrast to the very prominent granules or tubercles in others.

The distribution record shows that the species restricts itself to the high altitudes of the Himalaya and infests smaller branches of host-plants. It makes tunnels running obliquely or spirally up and down from the entrance gallery (Beeson, 1930).

### 36. *Cyclorhipidion longidens* (Eggers)

#### 1. *Xyleborus longidens* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 181, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Shillong, Meghalaya, India.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 748.

*Description* : *Female* : Body stout, pronotal and elytral shape as in *K. eggersi*; colour black. Body length 2.50 mm, nearly 2.2 times as long as wide.

Frons plano-convex with median line elevated, surface finely reticulate with close shallow punctures and sparse erect hairs. Eyes with less than half of its width emarginate.

Pronotum slightly wider than long and rest of the characters as in *Ambrosiodmus apicalis* except the presence of tuft of hairs at the postero-median portion.

Scutellum distinct and tongue-shaped.

Elytra 1.5 times as long as pronotum; lateral sides subparallel on basal half, then slightly wider and again converging posteriorly to broadly rounded apex; discal striae feebly impressed and with distinct punctures, each with a microhair; striae 1, 2 and 3 more impressed than other striae and marked by comparatively large punctures; interstriae 2-3 times wider than striae with a row of punctures, each with an erect hair. Declivity commencing slightly below the middle, face slanting; interstriae 2 and 3 each with a long curved spine at the commencement of declivity and interstria 4 elevated with 4 tubercles forming the upper declivital margin along with the tubercles on interstriae 2 and 3, and gradually small posteriorly; as a result declivital face somewhat concave, with striae 1, 2 and 3 distinctly impressed; all the spines bent towards declivity and tuft of hairs at the base of each spine; comparatively small and sparse hairs on declivital face. Pro- and meso-tibiae with 6 and 8 spiny teeth respectively.

*Male* : Unknown.

*Distribution* : INDIA : *Meghalaya* : Shillong. ELSEWHERE : None.

*Remarks* : Since its collection in 1925, no further material have been collected indicating its confinement in Meghalaya only. The spiny structure with tuft of hairs at their base at the commencement of declivity keep the species separate from all other representatives of the genus, so far known from India.

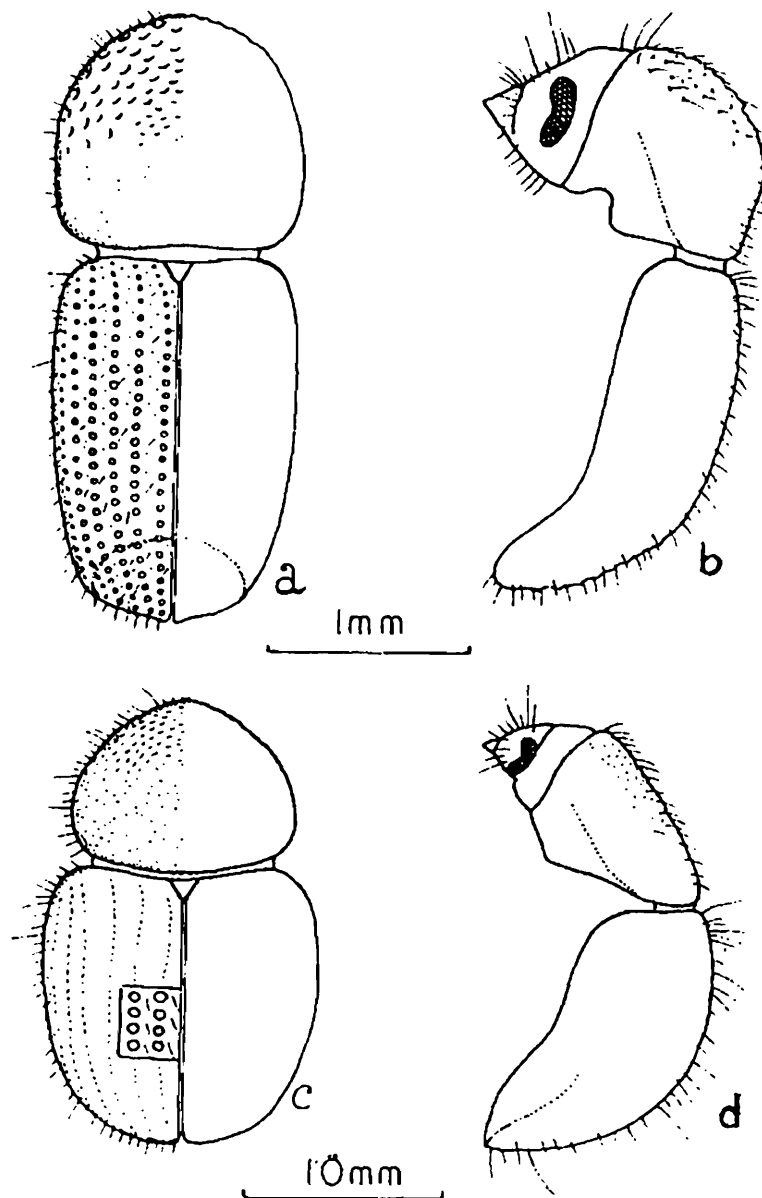
### 37. *Cyclorhipidion mussooriensis* (Eggers)

(Fig. 40)

#### 1. *Xyleborus mussooriensis* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 179-180, *Holotype* : Female Allotype and Paratype Male in F.R.I., Dehra Dun. *Type-locality* : Mussoorie, Uttar Pradesh, India.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 754.



**Fig. 40** : *Cyclorhipidion mussooriensis* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; Male : c, pronotum and elytra in dorsal view; d, head, pronotum and elytra in lateral view.

*Description : Female* : Body short, stout, densely hairy; head and elytra blackish brown, pronotum and legs brown. Body-length 3.70-3.72 mm, (type 2.50 mm), 2.30 times as long as wide.

Head as in *C. improbus*, but comparatively with prominent close punctures on either side of distinct median line. Eyes and antennae as in *C. improbus*.

Pronotum somewhat ovoid, nearly as long as wide; anterior margin round with contiguous asperities of unequal size, middle two more distinct; summit almost at the middle; decliveous portion with distinct close asperities, gradually becoming prominent anteriorly and with dense hairs; disc plano-convex with granules and minute hairs.

Scutellum triangular and shiny.

Elytra 1.8 times as long as pronotum, and 1.4 times as long as its own width; basal margin substraight, lateral sides subparallel upto basal four-fifth, gradually narrowing posteriorly with broadly rounded apex; discal striae gradually becoming more impressed towards declivity by distinct punctures; interstriae smooth and shiny with distinct punctures and erect hairs. Declivity commencing on posterior fifth, face somewhat convex, interstriae 3 and 4 feebly elevated almost at the middle of declivity, each interstria with fine granules and hairs, postero-lateral margins sharp but not carinate.

*Male* : Body yellowish brown, elytra rather darker. Body length 2.11 mm. In profile, body more convex than female and covered with both short and long hairs. Frons plano-convex with distinct short median line, surface reticulate with minute punctures on either side; vertex convex, shining, devoid of any hairs.

Pronotum subround, basal margin round, lateral sides moderately outcurved with anterior margin broadly round, antero-lateral and postero-lateral corners broadly round; summit not distinct, pronotal surface weakly convex gradually from base to apex; decliveous portion with close fine asperities gradually prominent anteriorly and few extending laterally, posterior half with fine punctures.

Elytra 1.30 times as long as pronotum and 1.29 times as wide as its own length; surface strongly convex from base to apex, basal margin weakly concave, lateral sides weakly convex and gradually converging posteriorly and terminating into a narrowly rounded apex, postero-lateral corners devoid of any carina; striae although deeply impressed marked by deep punctures; interstriae roughened and broader than striae with fine and coarse hairs; declivity commencing from slightly above from the middle, interstriae 1 and 2 distinctly depressed.

*Distribution* : INDIA : *Uttar Pradesh* : Mussoorie. ELSEWHERE : None.

*Host* : *Berberis nepalensis*.

*Remarks* : The species *Cyclorhipidion mussooriensis* is a very uncommon species so far known only from its type-locality.

### 38. *Cyclorhipidion sulcatus* (Eggers)

#### 1. *Xyleborus sulcatus* Eggers

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 180, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Upper dihing Reserve, Lakhimpur, Assam, India.

#### 2. *Ambrosiodmus sulcatus* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 680.

*Description* : *Female* : Body long and cylindrical, colour yellowish brown. Body length, 3.00 mm.

Frons plano-convex, devoid of any median lines, but medially elevated above epistomal margin; surface roughened with close irregular granules. Eye emarginate less than half of the width. Antennae as in *C. inarmatus*.

Pronotum subglobose, nearly as long as broad, lateral sides subparallel of basal half, then gradually narrowing anteriorly with broadly rounded unarmed anterior margin; indistinct summit at the middle; anterior half with small asperities, gradually decreasing in size posteriorly, posterior half with large distinct punctures; long fine hairs throughout, more long on anterior margin, postero-median portion of pronotum devoid of any tuft of hairs.

Scutellum small and somewhat tongue-shaped.

Elytra 1.4 times as long as pronotum and 1.4 times as long as its own width (incomplete due to non-availability of material).

*Male* : Unknown.

*Distribution* : INDIA : Upper dihing Reserve, Lakhimpur, Assam, ELSEWHERE : None.

*Host* : *Artocarpus lakoocha*.

*Remarks* : The species was under the genus *Ambrosiodmus*, a genus with extending upto postero-lateral margins of pronotum. Instead of this character, *X. sulcatus* possesses punctures on based one third of pronotum, as such it deserves its inclusion under *Cyclorhipidion* with close placement with *C. inarmatus* (Eggers). The species is until now known only from its type-locality.

Genus *Eccopterus* Motschulsky  
(Synonymy *Platydactylus* Eichhoff)

1. *Eccopterus* Motschulsky

1963. Motschulsky, *Bull. Soc. Imp. Nat. Moscou*, **36** : 515.
1910. Hagedorn, *Coleopt. Cat.*, **4** :
1914. Hopkins, *Proc. U.S. nat. Mus.*, **5** : 121.
1955. Browne, *Sarawak Mus. J.*, **6** : 351.
1959. Schedl, *Trans. R. ent. Soc. Lond.*, **111** : 512.
1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 90.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 79.
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No.* 86 : 81-82.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 819.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6* (B) : 812.

## 2. *Platydactylus* Eichhoff

1986. Eichhoff, *Not. Leyden Mus.*, **8** : 25.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 90 (Synonymy).  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 819.

## 3. *Eurydactylus nom. nov.* Hagedorn

1909. Hagedorn, *Dt. ent. Z.*, P. 733.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 90 (Synonymy).  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 819.

*Type of genera* : (i) *Eccoapterus* : *Eccoapterus (Scolytus) spinosus* Olivier and (ii) *Platydactylus* : *P. gracilipes* Eichhoff.

*Eccoapterus* described by Motschulsky (1963) is well defined old world genus due to its distinctive features of much enlarged metatibiae devoid of any marginal socketed tooth and compressed metatarsi. The genera *Platydactylus* Eichhoff and *Eurydactylus* Hagedorn were placed under the synonymy by Schedl (1962). However, some authors (Beeson, 1941 and others) considered it as the subgenus of *Xyleborus* Eichhoff. Only a single species *Eccoapterus spinosus* (Olivier) is known so far from India. It is predominantly an Oriental genus, with a few species extending to Japan and to some Pacific islands.

### 39. *Eccoapterus spinosus* (Olivier) (Fig. 41)

#### 1. *Scolytus spinosus* (Olivier)

1794. Olivier, *Entomologie*, **3** : 9. *Type-locality* : Java, Indonesia.

#### 2. *Eccoapterus spinosus* (Olivier)

1962. Schedl, *Ent. Elatt.*, **58** : 201.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 91-102.  
 1984. Saha and Maiti, *Rec. Zool. Surv. India*, **81** (3 & 4) : 2-3.  
 1986. Maiti and Saha, *Rec. Zool. Surv. India, Occ. Paper No. 86* : 82-85, Fig. 20, a-d.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 820-821.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 812.

#### 3. *Eccoapterus sexspinosus* Motschulsky

1863. Motschulsky, *Bull. Soc. Imp. Nat. Moscou*, **36** : 515-516, *Type-locality* : Sri Lanka.  
 1922. Beeson, *Indian Forester*, **48** : 496.

1915. Schedl, *Rev. suisse Zool.*, **82** (3) : 453.

1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 91.

#### 4. *Xyleborus sexspinosus* (Motschulsky)

1927. Eggers, *Philipp. J. Sci.*, **33** : 102, Male, Dehra Dun, India and Luzon, Philippines.

1930. Beeson, *Indian Forest Rec. (Ent.)*, **14** (10) : 81.

1941. Beeson, *Ecology and Control of Forest Insects of India and the Neighbouring Countries*, 309 p.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 821.

#### 5. *Xyleborus abnormis* Eichhoff

1868. Eichhoff, *Berl. Ent. Zeit.*, **12** : 282. *Type-locality* : Sri Lanka.

1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 92 (Synonymy).

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 821.

*Description : Female* : Body short and stout; head, pronotum and elytra chestnut brown to complete black; head with blackish tinge, antennae and legs brown, femora yellowish brown. Body length 2.60-2.70 mm, 2.2 times as long as wide. Head sparsely, pronotum moderately and elytra densely pilose.

Frons flat, weakly depressed above epistoma, demarked laterally by weak short longitudinal ridges; surface finely rugosely reticulate with sparse shallow punctures and scattered hairs; vertex smooth and shiny without any hairs; club obliquely truncate; on anterior face, basal corneous portion reduced with recurved costate apical margin forming a complete ring; truncate face with two more sutures; posterior face without any suture.

Pronotum almost as long as wide; basal margin weakly outcurved, lateral sides subparallel on basal two-thirds, then broadly converging anteriorly, anterior margin broadly rounded with a weak projection accommodating asperities increasing in size towards middle; summit prominent and placed just above basal one-third; anterior declivous two-thirds with distinct asperities, each appearing triangular in shape, posterior third with fine punctures and inconspicuous hairs.

Scutellum visible only on anterior declivous area of elytra basal margin.

Elytra about 1.1 times as long as and nearly as wide as pronotum, 1.1 times as long as its own width; lateral sides weakly outcurved and fairly strongly converging posteriorly with a narrowly rounded individual elytral apex; elytral disc convex, surface rough with irregular punctures and fine hairs; striae and interstriae hardly marked due to irregular punctures. Declivital face excavated, occupying more than posterior two-thirds; excavated margins with three large pointed tubercles on each elytron, gradually decreasing in length posteriorly; striae and interstriae not demarked on the

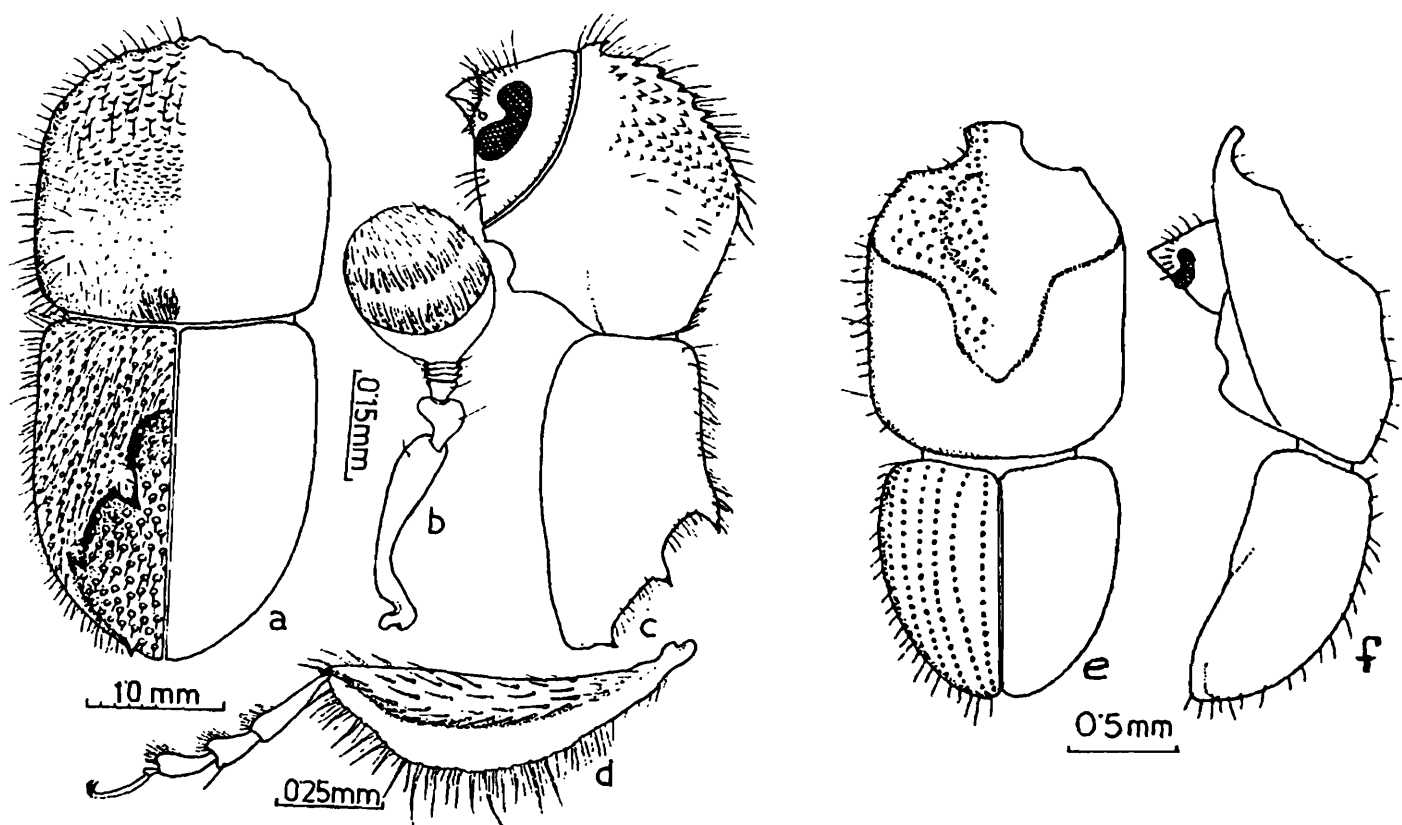


Fig. 41 : (a-d) *Eccoptopterus spinosus* (Oliver), Female : a, Pronotum and elytra in dorsal view; b, antenna; c, head, pronotum and elytra in lateral view; d, metatibia and matatarsi. Male : e, Pronotum and elytra in dorsal view; f, head, pronotum and elytra in lateral view.

declivital face; but with large irregular punctures, each puncture with a microhair; entire elytral margin with long erect stout hairs. Pro- and meso-tibiae with 5 teeth in each.

*Male* : Body deformed and much reduced, head and pronotum dark brown; elytra antennae and legs pale brown. Body length 2.85 mm, 2.54 times as long as broad.

Head somewhat margined laterally and concealed under the projection of pronotum; frons flat with few hairs. Eyes reduced with feeble emargination. Antennae as in female.

Pronotum much enlarged, 1.21 times as long as elytra and 1.23 times as long as wide; basal margin weakly outcurved, lateral sides unevenly subparallel on more than basal half, whence strongly converging anteriorly and terminating into a broad, blunt and flattened median projection, slightly projecting outwards; lateral margins on anterior fourth with one distinct blunt tubercle on either side; anterior three-fourths strongly excavated with suboval flat and punctate depress area; a weak depressed longitudinal line extending from basal fourth upto the base of anterior projection; either side of excavated margins bluntly projected at the middle.

Scutellum submerged, small and triangular. Elytra very much reduced, strongly

convex and smaller than pronotum; 1.17 times as long as wide; lateral sides weakly outcurved with tapering end; elytral apex narrowly rounded; distinct punctures and dense hairs; declivity commencing from slightly above the middle, narrowly depressed area along the suture; declivital face concave with scattered punctures bearing microhairs; declivity devoid of any tubercle; declivital striae and interstriae obsolete on disc.

*Distribution* : INDIA : *Andamans* : North and Middle Andamans. *Assam* : Dihing Reserve. *Maharashtra* : East and South Kanara. *Sikkim* : Mamring (near Rongpo, 300 m). *Tamil Nadu* : Nilambur Dist., Conoo River Valley. *West Bengal* : Darjiling Dist., Lepchajagat. ELSEWHERE : Malaysia, Indonesia (Java, Sumatra, Borneo and Celebes), Myanmar, Sri Lanka, Taiwan, Seychelles, Australia and East Africa.

*Hosts* : *Albizia lebbek*, *A. odoratissima*, *Anacardium occidentale*, *Bassia latifolia*, *Bridelia retusa*, *Calophyllum spectabile*, *Canarium euphyllum*, *Dyospyros oocarpa*, *Dipterocarpus turbinatus*, *Erythrina indica*, *Myristica andamanica*, *Parishia insignis*, *Pterocarpus dalbergoides*, *Shorea robusta*, *Sterculia ornata*, *S. villosa*, *Symplocos theaefolia*, *Salmalia insignis*, *Tectona grandis* and *Terminalia bialata*.

*Remarks* : *Eccoptoperus spinosus*, a widely distributed species in the old world tropics, is characterised in having three prominent and pointed tubercles on excavated margins of elytral declivity. It generally infests the small branches and stems of felled or unhealthy trees, but it also occurs rarely in soil litter in Africa. The species makes short entrance tunnel with 5 or 6 irregular branches extending hardly beyond 4 cm in the wood and completes its development within about 30 days (Browne, 1961). Further biological information on the habits and host-records have been provided by Beeson (1941), Kalshoven (1959) and Schedl (1963 and 1965).

## Genus *Euwallacea* Hopkins

### 1. *Euwallacea* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 54.

1951/52. Schedl, *Ent. Blatt.*, **17/18** : 162.

1961. Browne, *Malay Forest Rec.*, No. 22, p. 124.

1978. Wood, *Annl. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.

1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 85-86.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 685.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 786 and 812.

*Type of genus* : *Euwallacea* : *Xyleborus wallacei* Blandford.

The genus *Euwallacea* was established by Hopkins (1915) with the designation of type species *Xyleborus wallacei* Blandford from New Guinea. However, the validity

of the genus was in a confused state for a long time, until Schedl (1951/52) synonymised it under the genus *Xyleborus*. But, Browne (1961) continued to keep it as *Euwallacea*-group under the genus *Xyleborus*. Recently, Wood (1980), and Wood and Bright (1992) revived its generic status which had been followed here.

In fact, most of the representatives of the genus from India are so far known only from the eastern India including the islands of Andaman. However, 9 species from India have been assigned to the genus of which single species *E. aplanatus* Wichmann is not included here due to lack of material. The generic characters of *Euwallacea* and *Xyleborus* can hardly be distinguished. The antennal club with its rounded apical margin of basal corneous portion on anterior face and either one or two sutures on the posterior face serve as the differentiating characters of *Euwallacea*. The anterior margin of pronotum is unarmed.

#### **General characters of the genus *Euwallacea* Hopkins.**

*Description : Female* : Body small to large in size, narrowly to broadly cylindrical in appearance and yellowish brown or reddish brown to complete black in colour. Body length 2.40-5.40 mm, 1.9-2.8 times as long as wide.

Head generally globose, frons plano-convex, median line either present or absent, if absent, then generally with weak transverse depression along the level of eyes marking a weakly elevated area between epistomal margin and impressed line; surface with scattered punctures and hairs throughout. Eyes elongately oval, more or less broadly emarginate upto half of its width. Antennal scape long, funicle with 5 segments; club somewhat obliquely truncate; segment 1 corneous; on anterior face of basal corneous portion with rounded apical margin; segment 2 somewhat chitinized, above which sometimes depressed; posterior face marked either with 1 or 2 distinct sutures, terminal suture generally subapical.

Pronotum invariably subquadrate in shape, almost as long as broad; basal margin substraight, lateral sides weakly outcurved, anterior margin broadly rounded and either unarmed summit somewhat distinct and placed on or near the middle, anterior declivous surface generally weakly convex and sloping gently or steeply with distinct but small asperities, still becoming smaller posteriorly and postero-laterally; portion below the summit smooth and shiny with sparse minute or large punctures; anterior declivous and postero-lateral areas with long erect hairs.

Scutellum smooth, shiny and glabrous, and subround to triangular in shape; in some species (*E. tristris*), scutellar space margined by U-shaped ridge.

Elytra 1.3-1.8 times as long as pronotum; basal margin substraight, in some species (*E. interjectus*, *E. velatus* and *E. malloti*) with a feeble ridge; lateral sides subparallel upto basal three-fourths, thence converging posteriorly and terminating into narrowly to somewhat broadly rounded apices; discal striae marked by close distinct punctures and devoid of any microhair; interstriae generally flat, smooth and shiny, 2-3 times as wide as striae, with uniseriate granules or punctures provided with erect hairs; discal hairs sometimes inconspicuous. Declivity commencing at or below the middle,

face plano-convex, either roughened or smooth, becoming flattened towards postero-lateral margins in some species (*E. interjectus*); striae marked by shallow punctures, sutural stria sometimes comparatively impressed; interstriae either flat or weakly convex and either with granules or punctures, postero-lateral margins acute or broadly margined, with or without carinae, at times provided with granules, otherwise bare; surface sparsely or densely hairy. Procoxae contiguous, protibiae with 4-10 and meso- and meta-tibiae with 6-13 teeth.

### Key to the species of *Euwallacea* Hopkins based on females

1. Smaller species, body length less than 2.30 mm; body more slender, about 3.00-3.10 times as long as wide ..... 2
  - Larger species, body length more than 2.30 mm (2.30-5.00 mm); body stout and less than 3 times (1.90-2.80 times) as long as wide ..... 3
2. All declivital interstriae bearing granules of almost of equal sizes; body length 2.10-2.25 mm ..... *E. piceus* (Motschulsky)
  - Declivital interstriae 1 and 3 only weakly elevated bearing 3-4 small tubercles, the remaining declivital interstriae generally with granules except on 2 (sometimes small granules at commencement of declivity); body length 1.75-1.90 mm .....  
..... *E. bicolor* (Blandford)
3. Scutellum small and rounded, scutellar apex broadly rounded ..... 4
  - Scutellum either elongately oval or triangular, scutellar apex narrowly rounded ..... 5
4. Scutellar space margined by somewhat U-shaped ridges (Fig. 49a); elytral surface shiny throughout; smaller species, body length 3.80-3.90 mm .... *E. tristis* (Eggers)
  - Scutellar space neither present nor margined by U-shaped ridges; elytral surface opaque, particularly on declivital face; larger species 4.00-5.00 mm .....  
..... *E. wallacei* (Blandford)  
..... \**E. destruens* (Blandford)
5. Elytra in profile, uniformly convex and gradually sloping towards declivital apices ..... 6
  - Elytra in profile, slightly angularly convex at the commencement of declivity and thence sloping towards declivital apices ..... 9
6. Smaller species, generally less than 3.00 mm (2.25-2.80 mm) ..... 7
  - Larger species, generally 3.00 or more (3.00-3.40 mm) ..... 8

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\**Euwallacea destruens* is very similar to *E. wallacei*, except its smaller size, hence it has been kept in key with *E. wallacei* until further material is available for study to solve the status of the species.

7. Scutellum transverse, distinctly wider than long; pronotum and elytra bicolor; elytral basal margin with feeble transverse ridge; elytral declivity with small hairs; body length 2.30-2.45 mm ..... *E. malloti* (Eggers)
- Scutellum triangular, nearly as long as wide; pronotum and elytra uniform in colour; elytral basal margin without any transverse ridge; elytral declivity with long hairs; body length 2.50-2.70 mm ..... *E. fornicatus* (Eichhoff)
8. Postero-lateral margins of declivity devoid of carinae, but with sharp margin and with distinct granules; elytra 1.5 times as long as pronotum; body length, 3.00-3.10 mm ..... *E. velatus* (Sampson)
- Postero-lateral margins of declivity with distinct carinae, devoid of any granules; elytra 1.30 times as long as pronotum; body-length 3.25-3.40 mm ..... *E. xanthopus* (Eichhoff)
9. Declivity pronounced, commencing on posterior fourth; declivital slop somewhat stiff; body length 3.40-3.85 mm ..... *E. sibsagricus* (Eggers)
- Declivity commencing on or below middle; declivital face gently sloping towards apex ..... 10
10. Elytral declivity depressed near the postero-lateral margins, postero-lateral margins provided with distinct carinae along with a few minute granules; pronotal asperities smaller; discal interstriae with shorter and stouter hairs than those on declivity; body-length 2.60-3.20 mm ..... *E. andamanensis* (Blandford)
- Elytral declivity not depressed near the postero-lateral margins; provided with carinae, but devoid of any granules; pronotal asperities larger, both discal and declivital interstriae with long and stout hairs; body length 3.45-4.00 mm ..... *E. interjectus* (Blandford)

#### 40. *Euwallacea andamanensis* (Blandford)

(Fig. 42)

##### 1. *Xyleborus andamanensis* Blandford

1896. Blandford, *Trans. ent. Soc. Lond.*, p. 222, *Holotype* : Female in B.M. Nat. Hist., London. Allotype and Paratype Males in Mus. Nat. Hist., Wien. *Type-locality* : Andaman Islands, India.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 99.
1954. Schedl, *Philipp. J. Sci.*, **83** : 153, Male from Java, Indonesia.
1969. Schedl, *Oriental Ins.*, **3** (1) : 52.
1975. Schedl, *Revue suisse Zool.*, **82** (3) : 450.
1979. Schedl, *Nat. Mus. Wien Entomologie*, **3** (2) : 19.

## 2. *Euwallacea andamanensis* (Blandford)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 86-88, Fig. 21, a and b.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 685-686.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 813-814.

## 3. *Xyleborus noxius* Sampson

1925. Sampson, *Ann. Mag. nat. Hist.*, **12** (9) : 445. *Type-locality* : Nilambur, Tamil Nadu, India, *Holotype* : Female in *B.M. Nat. Hist.*, London.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 686 (Synonymy).

## 4. *Xyleborus siobanus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 186, Female. *Type-locality* : Mentawai Island.  
 1958. Schedl, *Tijdschr. Ent.*, **101** (3-4) : 150 (Synonymy).

## 5. *Xyleborus granulipennis* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* **14** (9) : 194-195, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Nadghani, Nilambur, Tamil Nadu, India.  
 1989. Wood, *Gt. Basin Nat.*, **49** : 172 (Synonymy).

## 6. *Xyleborus burmanicus* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* **14** (10) : 210-211, Female. *Type-locality* : Myanmar  
*Holotype* : Female in F.R.I., Dehra Dun.  
 1970. Schedl, *Ann. Naturhistor. Mus. Wien*, **74** : 224 (Synonymy).

## 7. *Xyleborus intextus* Beeson

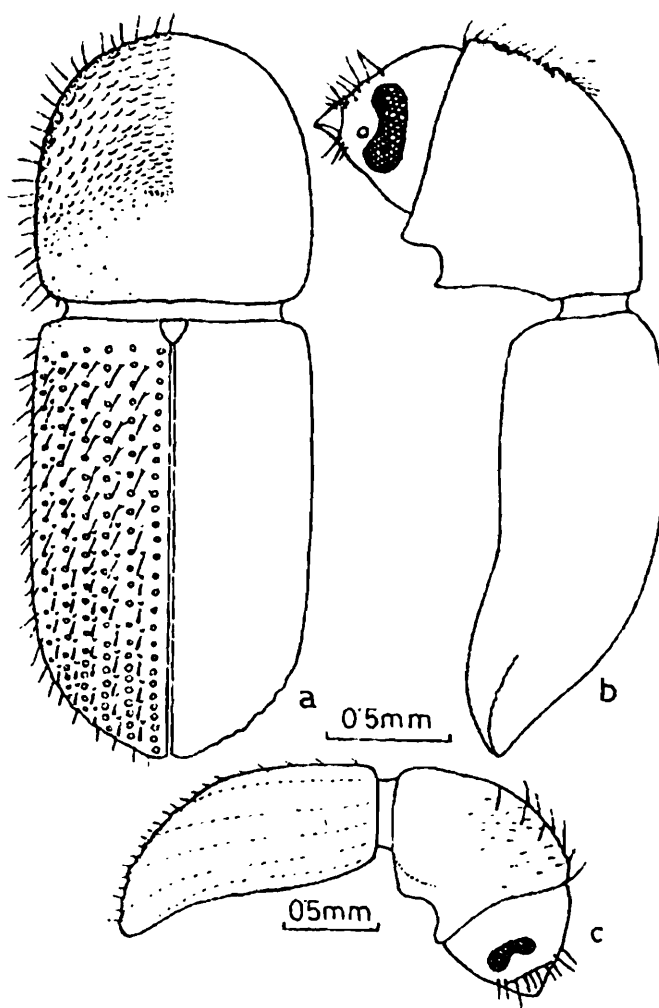
1930. Beeson, *Indian Forest Rec., (Ent.)* **14** (10) : 35. Female, *Type-localities* : Tonkin, Myanmar and India (Assam and West Bengal).  
 1971. Schedl, *Steenstrupia*, **1** : 155 (Synonymy).

## 8. *Xyleborus senchalensis* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* **14** (10) : 212. Female. *Type-locality* : Darjiling, Rangirum and Senchal Range, West Bengal, India. *Holotype* : Female in F.R.I., Dehra Dun.  
 1989. Wood, *Gt. Basin Nat.*, **49** : 172 (Synonymy).

*Description* : *Female* : Body oblong and fairly large; head, pronotum and elytra yellowish brown to backlash brown. Body length 2.60-3.20 mm and 2.5 times as long as wide.

Frons plano-convex, weakly impressed above epistomal margin, and separated by a median raised line, surface finely reticulate with scattered deep punctures and few



**Fig. 42 :** *Euwallacea andamanensis* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; Male : c, head, pronotum and elytra in lateral view.

long scattered hairs. Basal corneous portion of antennal club with weakly recurved apical margin; on truncate face, segment 2 chitinised, above which slightly concave.

Pronotum subquadrate, as long as wide; lateral sides weakly outcurved, anterior margin broadly rounded with a few large asperities; summit at the middle; anterior declivital portion with fairly distinct asperities, in a crescentic rows, gradually decreasing in size posteriorly and a few gradually extending postero-laterally below the summit and also with a few scattered hairs; basal one-third smooth and shiny with scattered minute granules, but devoid of any distinct hairs.

Scutellum triangular, shiny with posterior margin narrowly rounded.

Elytra 1.6 times as long as and nearly as wide as pronotum, 1.6 times as long as its width; elytral base somewhat truncated, lateral sides subparallel upto anterior three-fourths, apex broadly rounded; discal striae marked by large close punctures, without any microhair; interstriae rather smooth and shiny nearly twice as wide as striae with uniseriate setose granules, increasing in size towards spices except a few

shallow punctures towards basal narrow strip. Declivital slope continuous, commencing slightly below the middle; face convex rather flat towards apex, postero-lateral margins acute, not carinate but lined by a few granules; striae weakly impressed, but punctures more distinct and closer; interstriae weakly convex, with large uniseriate granules and short, stout hairs. Procoxae contiguous, protibiae with 6 and both meso- and meta-tibiae with 8 teeth.

*Male* : Body more or less similar to female, except the following characters. Body reduced, median line on frons indistinctly marked; pronotum with small asperities becoming granulate postero-laterally; elytra much reduced with somewhat confused striae and interstriae but with well marked granules and small hairs. Declivital face steep, not so flattened towards postero-lateral margins as in female. Body length 2.35-2.40 mm.

*Distribution* : INDIA : *Andaman Islands* : North, Middle and South Andamans (Port Blair); *Assam* : Lakhimpur Dist., Upper Dihing Range; *Bihar* : Singhbhum; *Madhya Pradesh*; *Maharashtra*; *Tamil Nadu* : Anaimalai Hills; *West Bengal* : Darjiling Dist., Rangirum and Senchal Range. ELSEWHERE : Myanmar, Indonesia (Borneo, Java and Sumatra), Malaysia, Micronesia and New Guinea.

*Hosts* : *Artocarpus chaplasi*, *Bombyx insigne*, *Pterocarpus dalbergioides*, *Tetrameles nudiflora*, *Terminalia procera*.

*Remarks* : Only recently, the species has been transferred to *Euwallacea* by Maiti and Saha (1986). Otherwise, it remained a valid species, since its inception in 1986. However, a number of species has been synonymised under it from time to time, thereby extending its range of distribution and variations. Field biological notes of the species are well documented by Beeson (1930 and 1941) and Browne (1961).

#### 41. *Euwallacea bicolor* (Blandford)

(Fig. 43)

##### 1. *Xyleborus bicolor* Blandford

1894. Blandford, *Trans. ent. Soc. Lond.*, pp. 113-114, *Types* : Females in *B.M. Nat. Hist.*, London. *Type-locality* : Nagasaki, Japan.

1910. Hagedorn, *Coleopt. Cat.*, 26 (4) : 99.

1961. Browne, *Malay. Forest Rec.*, No. 22, pp. 147-148.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 113-115.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 831-832.

##### 2. *Euwallacea bicolor* (Blandford)

1992. Wood and Bright, *Gt. Basin at. Mem.*, No. 13 (Vol.-A) : 687.

### 3. *Xyleborus bicolor unimodus* Beeson

1929. Beeson, *Brit. Mus. nat. Hist.*, 4 (4) : 238, *Holotype* : Female in *B.M. Nat. Hist.*, London.  
*Type-locality* : Tutuila : Pago Pago.
1989. Wood, *Gt. Basin Nat.*, 49 : 172 (Synonymy).

### 4. *Xyleborus rodgeri* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* 14 (10) : 37 and 38, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Middle Andaman, India.
1959. Schedl, *Trans. R. Soc. London*, 111 : 504-505.
1971. Schedl, *Oriental Ins.*, 5 (3) : 370.
1989. Wood, *Gt. Basin Nat.*, 49 : 173 (Synonymy).

### 5. *Xyleborus rodgeri* var. *privatus* Beeson

1930. Beeson, *Indian Forest Rec., (Ent.)* 14 (10) : 37-38 and 79.
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 135-137 (Synonymy).

### 6. *Xyleborus rameus* Schedl

1940. Schedl, *Ann. Mag. nat. Hist.*, 5 (11) : 441-442, Female and Male, *Holotype* : *Nat. Hist. Mus.*, Wien. *Type-locality* : Luzon, Philippines.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, 35 : 47 (Synonymy).

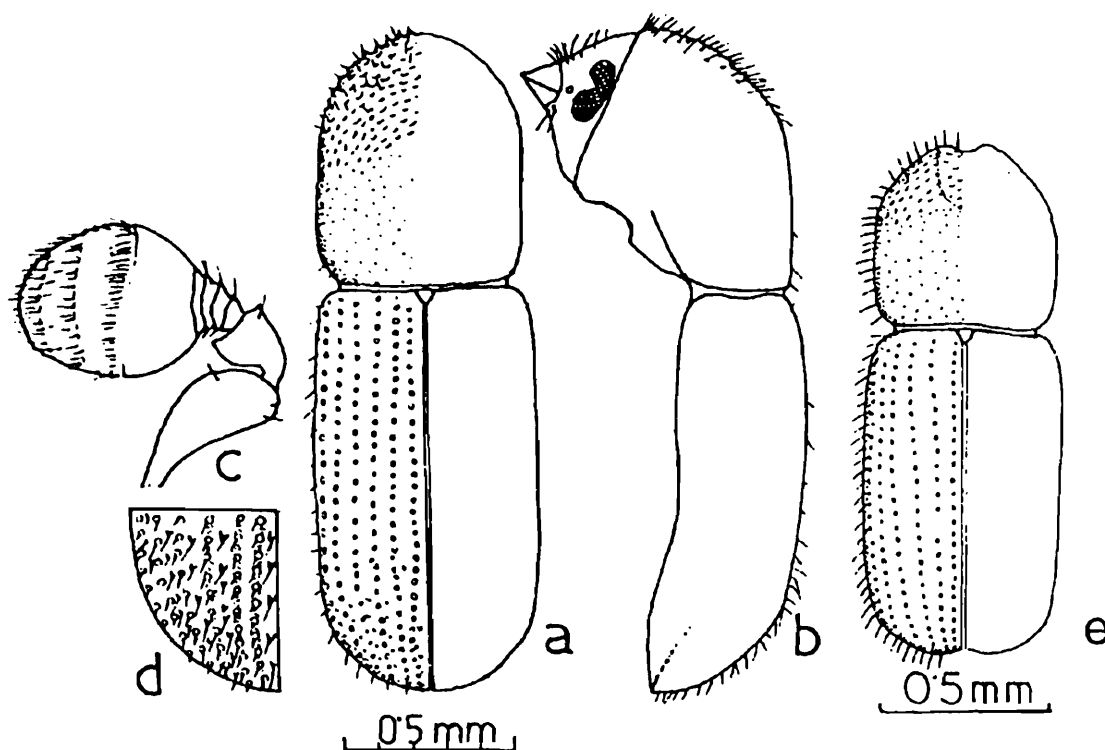
*Description : Female* : Body cylindrical; head and pronotum reddish brown and elytra brown to blackish brown; antennae and legs rather yellowish brown. Body length 1.75-1.85 mm, 3.1 times as long as wide.

Frons plano-convex, weakly elevated medially, but without any distinct median line, surface finely reticulate with a few scattered deep and shallow punctures, and with a few long erect hairs. Antennal scape short and stout; club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring being subapical on posterior face, indicating a suture; truncate face with two more sutures.

Pronotum 1.1-1.2 times as long as wide; basal margin substraight; lateral sides subparallel upto basal two-thirds; anterior margin broadly rounded and with a few contiguous asperities; summit indistinct and placed on anterior third; anterior one-third with weak asperities and long erect hairs, a few asperities extending posterolaterally; posterior two-thirds almost smooth with fine small punctures and inconspicuous hairs.

Scutellum triangular.

Elytra 1.4-1.5 times as long as pronotum, nearly 1.7 times as long as its width; basal margin substraight; lateral sides subparallel upto basal two-thirds, thence weakly



**Fig. 43** : *Euwallacea bicolor* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna; d, enlarged view of declivity of single elytron. Male : e, pronotum and elytra in dorsal view.

narrowing posteriorly and sutural apex incurved; disc glabrous; striae not so impressed, marked by small distinct punctures and each with a microhair; interstriae at least twice as wide as striae, punctures hardly visible. Declivity commencing on posterior third; face convex, postero-lateral margins carinate and confluent with interstria 7; strial punctures with microhairs; all the declivital interstriae with sparse uniseriate long setaeferous granules, except interstria 2, those on interstriae 1 and 3 comparatively distinct. Procoxae contiguous; pro- and meta-tibiae with 6 and 7 teeth respectively.

*Male* : Males more or less similar to females except in the following characters; Body small. Pronotum with basal two-thirds of lateral margins weakly outcurved, thence converging anteriorly with distinct emargination at the apex forming a bituberculate structure; anterior one-third flattened with comparatively small asperities becoming granulate postero-laterally and with long hairs; posterior two-thirds shining, punctures and hairs inconspicuous, except a few hair, more distinct laterally.

Elytra 1.7 times as long as pronotum, otherwise more or less similar to female; striae and interstriae slightly confused towards declivity, otherwise shiny, with a few puncture and declivity with less prominent granules; postero-lateral carinae distinct.

*Distribution* : INDIA : Assam : Sibsagar, Nambor Reserve, Lushai Hills. Andaman and Nicobar Islands : North, Middle and South Andamans; Nicobars; Tamil Nadu : North Malabar, Kannothe Range; Uttar Pradesh : Dehra Dun, Siwaliks, Haldwani; West Bengal : Darjiling Dist., Govt. Cinchona Plantation, Mungphu and Samsingh.

Jalpaiguri Dist., Lataguri and Upper Tondlu Range. South 24-Parganas Dist. Sundarban. ESLEWHERE : Indonesia (Borneo and Java), Malaysia, Myanmar, Fiji Island, Japan, Samoan Island and Solomon Islands.

*Hosts* : *Acrocarpus fraxinifolius*, *Albizia moluccana*, *Castanopsis tribuloides*, *Duabanga sonneratioides*, *Eugenia jambolana*, *Myristica andamanica*, *Nyssa sessiliflora*, *Shorea robusta* and *Terminalia belerica*.

*Remarks* : The small pinehole borer of variable size is widely distributed in the Oriental from India to Japan and the Fiji including many localities in the intervening areas. The species is very close to *E. piceus* Motschulsky, but can easily be distinguished by the absence of granules or tubercles on declivital interstria 2. Though, the name of the species seems to derive from two different colours of pronotum and elytra, yet the uniform single colour in some specimens is not uncommon. It is recorded until now from number of hosts including Mangrove plants (Beeson, 1930 and 1941, Bhasin, Roonwal and Singh, 1958). Many species have been synonymised under it until now.

#### 42. *Euwallacea destruens* (Blandford)

##### 1. *Xyleborus destruens* Blandford

1896. Blandford, *Trans. Ent. Soc. London*, 1896 : 221. Gilolo, Java, *Syntypes* Male and Female in *B.M. Nat. Hist.*, London.

1919. Roepke, *Treubia*, 1 : 15.

1929. Beeson, *Brit. Mus. nat. Hist.* 4 (4) : 241.

1960. Wood, *B.P. Bishop Mus.*, 18 (1) : 59.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 687-688.

##### 2. *Xyleborus pseudoerberatus* Schedl

1942. Schedl, 1942, 1993, *Syntype* : Female in *B.M. Nat. Hist.*, London, *Type-locality* : Kuala Lumpur, Malaysia.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 688 (Synonymy).

*Description* : *Female* : Body elongate, colour very dark brown. Body length 4.5-5.0 mm, 2.7 times as long as wide.

Frons weakly convex, surface reticulate with five punctures, inconspicuously hairy. Eyes emarginate upto middle. Pronotum subquadrate, almost as wide as long, anterior margin and sides unarmed; summit almost at the middle; weakly outcurved, anterior declivous protion with fine asperities, asperities extending to basal third at lateral sides; disc with sparse and minute punctures; inconspicuously hairy.

Elytra 1.7 times as long as wide and 1.6 times as long as pronotum; lateral sides straight and subparallel on basal two-thirds, thence narrowing posteriorly with broadly rounded apex; striae weakly impressed marked by small, shallow and close punctures;

interstriae almost twice as wide as striae, with fine sparse punctures admixed with fine and irregular granules. Declivity rather steep, but flattened on lower half, lateral margin from interstria 7 to apex rather strongly elevated and irregularly carinate, striae punctures twice as large as on disc; striae 1 to 3 curved strongly towards suture; interstria 1 much narrower towards apex, strial hairs very small mixed with erect hairs, declivital hairs somewhat shorter.

*Male* : Not represented in the collection.

*Distribution* : INDIA : Andaman Islands. ELSEWHERE : Indonesia (Sumatra, Java), Papua, Samona and Caroline Isl.

*Remarks* : The species is very unfamiliar in India, except its single record in the Andaman Islands (Wood, 1960; Wood and Bright, 1992)

43. *Euwallacea fornicatus* (Eichhoff)  
(Fig. 44)

1. *Xyleborus fornicatus* Eichhoff

1868. Eichhoff, *Berl. ent. Z.* **12** : 151-152, *Types* : Syntype, In Sri Lanka; Hamburg Museum (lost). *Type-localities* : Queensland, Australia and Indonesia.
1896. Blandford, *Trans. ent. Soc. Lond.*, pp. 213-214, Male, Sri Lanka.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 104.
1923. Eggers, *Zool. Meded.*, **7** : 185.
1959. Nunberg, *Beitr. Ent.*, **9** (3/4) : 425.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 54-55.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 608.

2. *Euwallacea fornicatus* (Eichhoff)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 688-690.

3. *Xyleborus ignobilis* Perkins

1900. Perkins, *Fauna Hawaiiensis*, **2** : 180, Female, *Type-locality* : Hawaii.
1959. Schedl, *Trans. R. ent. Soc. Lond.*, **111** : 498 (Synonymy).

4. *Xyleborus fornicator* Eggers

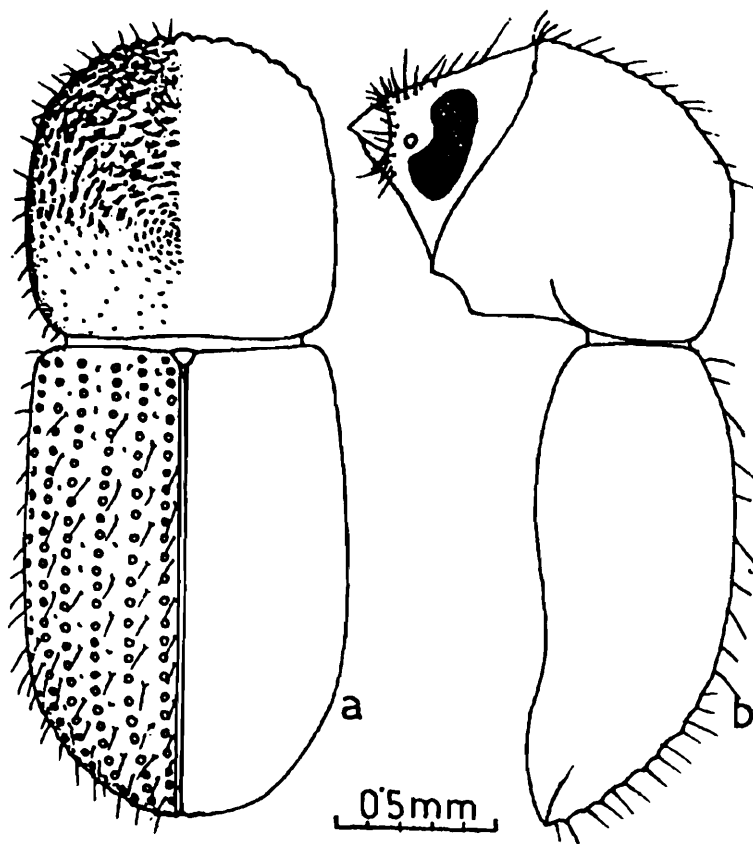
1923. Eggers, *Zool. Meded.*, **7** : 184-185, Female. *Type-locality* : Sri Lanka.
1959. Schedl, *Trans. R. ent. Soc. Lond.*, **111** : 498 (Synonymy).

5. *Xyleborus nigricans* Eggers (*nom. nud.*)

1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 54 (Synonymy).

*Description : Female* : Body short and stout; head, pronotum and elytra deep reddish brown, antennae and legs paler. Body length 2.50 mm, 2.2 times as long as wide.

Frons weakly convex and devoid of any median line, but weakly elevated medially; surface finely reticulate with a few irregular punctures and erect hairs. Antennal club somewhat obliquely truncate; on anterior face, basal corneous portion reduced and with weakly recurved apical margin; segment 2 distinctly chitinised, remaining ones concave; posterior face with one suture.



**Fig. 44** : *Euwallacea fornicatus* (Eichhoff), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum subquadrate, as long as broad; lateral sides weakly outcurved; anterior margin rounded and armed with a few very weak asperities; summit distinct placed at the middle; declivous area somewhat steep with convex surface and with distinct but small asperities, still becoming smaller posterior-laterally, posterior area smooth and shiny with sparse minute punctures; long erect hairs only on anterior and postero-lateral areas.

Scutellum triangular.

Elytra 1.6 times as long as pronotum, 1.6 times as long as its width; lateral sides subparallel terminating into broadly rounded apex, discal striae marked by close shallow punctures, without any microhair; interstriae flat and shiny, with uniseriate

sparse granules, except a few punctures at basal portion with some erect hairs. Declivital slope continuous, face flatly convex; postero-lateral margins acute, distinctly carinate; striae feebly impressed, punctures rather distinct; interstriae with sparse granules and long erect hairs. Procoxae contiguous; protibiae with 9 and both meso- and meta-tibiae with 10 teeth.

*Male* : Males somewhat like females, but in profile more convex; colour pale brown; body length 1.55 mm.

Frons plano-convex, feebly elevated medially at the level of eyes; surface finely reticulate and with distinct punctures and erect hairs.

Pronotum subglobose, gradually convex from base towards apex; anterior margin unarmed; anterior half with a few weak asperities and long fine hairs; posterior half with distinct punctures and fine small hairs.

Elytra more convex; striae punctures on disc large and distinct; interstriae with minute punctures; declivital face flat; striae 1 and 2 feebly impressed; interstriae with long erect hairs, more distinct at declivital face.

*Distribution* : INDIA : *Assam* : Sibsagar; *Karnataka* : Bangalore; *Tamil Nadu* : Nilambur, Nilgiri, Conoor River Valley, Hillgrove; *Uttar Pradesh* : Dehra Dun; *West Bengal* : Darjiling Dist., Mongphu, Tista Valley, Samsingh; Jalpaiguri Dist., Nagrakata. ELSEWHERE : From Sri Lanka to Taiwan and New Guinea, Fiji, New Hebrides and Sandwich Islands, and the Madagascar.

*Hosts* : As many as 25 hosts are known from India and its neighbouring countries (Beeson, 1930 and 1941; Das, 1965) of which real hosts are difficult to recognise from India. However, two more hosts, namely *Dalbergia sisoo* and *Michelia champaca* have been recorded from West Bengal (Saha and Maiti, 1996).

*Remarks* : *Euwallacea fornicatus* is very close to *E. malloti* from which it can be differentiated only by its larger size and triangular scutellum. It is a well known short-hole borer of the twigs and small branches of numerous trees including tea plantations in the Oriental and Oceania Regions. The castor oil plant (*Ricinus communis*) is supposed to be its principal food-plant. However, its generation continuously breeds on tea bushes in Sri Lanka and differs in morphological characters from the typical castor form by their smaller size and convex curvature of the elytra. As such, Eggers (1923) named a species, *Xyleborus fornicator* for populations infesting tea bushes in Sri Lanka which was ultimately synonymised under *X. fornicatus* Eichhoff by Schedl (1966). However, the species sparsely occurs in the sub-Himalayan West Bengal infesting *Michelia champaca* and other unknown wood. In spite of vast plantation of tea in the eastern India, only a single collection is made so far from the dead tea plant at Nagrakata, West Bengal. Species is abundant in other hosts in the north-east India (Das, 1965). The biology of the species is fairly well studied by Beeson (1930 and 1941) and Das (1965) in India, and Browne (1961) in Malaysia.

44. *Euwallacea interjectus* (Blandford)  
(Fig. 45)

1. *Xyleborus interjectus* Blandford

1894. Blandford, *Trans. ent. Soc. Lond.*, pp. 567-577, *Holotype* : Females in *B.M. Nat. Hist.*, London, 1 Female Metatype in *Mus. Nat. Hist.*, Wien. *Type-locality* : Japan and China (Chusan Isl.).
1923. Eggers, *Zool. Meded.*, **7** : 198, Locality not mentioned.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 57-58.
1975. Schedl, *Oriental Ins.*, **9** (4) : 451.
1975. Schedl, *Revue suisse Zool.*, **83** (3) : 451.
1977. Kumar and Chandra, *Oriental Ins.*, **11** (1) : 34 and 35, Male, Uttar Pradesh, India.

2. *Euwallacea interjectus* (Blandford)

1984. Maiti and Saha, *Rec. zool. Surv. India*, **81** (3 & 4) : 2.
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 88-91, Fig. 22, a-d.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 690-691.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 5 : 646, Part 6 (B) : 813-816.
2000. Saha and Maiti, *State Fauna Series 4 : Fauna of Meghalaya*, Part 5 : 646.

3. *Xyleborus pseudovalidus* Eggers

1925. Eggers, *Sbornik ent. Nat. Mus. Prag.*, p. 159. *Type-locality* : Myanmar.
1958. Eggers, *Tijdschr. Ent.*, **101** (3-4) : 155 (Synonymy).

4. *Xyleborus lopchuensis* Beeson (*nom. nud.*)

1975. Schedl, *Revue suisse Zool.*, **83** (3) : 451.

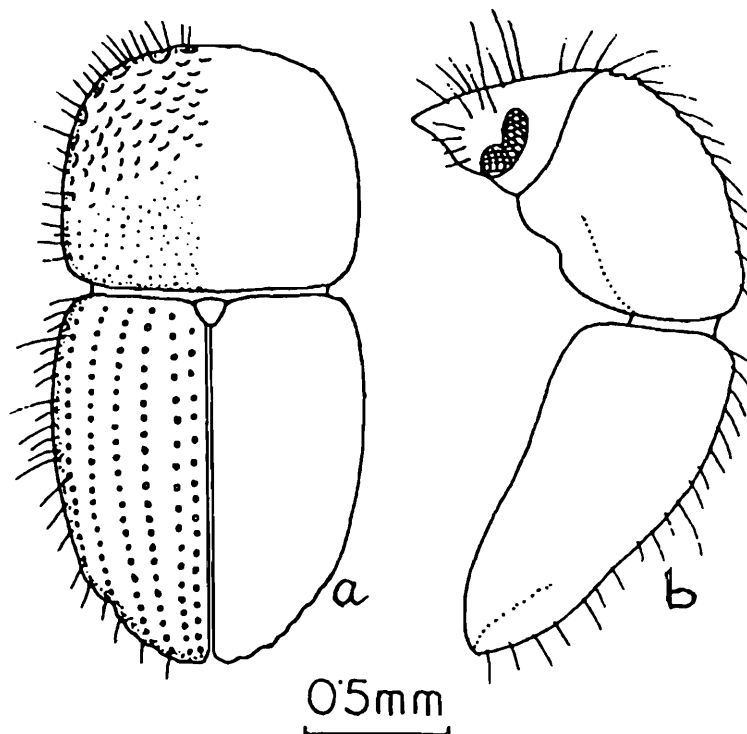
*Description* : *Female* : Body short and cylindrical; head, pronotum and elytra yellowish brown to pitchy black; antennae and legs paler. Body length 3.65-4.00 mm, 2.20 times as long as wide.

Frons plano-convex with distinct or indistinct median line; surface finely reticulate, except on median portion, on either side of the median portion with close punctures and long erect hairs. Basal corneous portion of antennal club with substraight apical margin; segment 2 on truncate face chitinised, posterior face marked with one distinct suture, other one obscure.

Pronotum subquadrate, almost as long as broad or slightly broader; lateral sides weakly outcurved; anterior margin broadly rounded and armed with weak transverse asperities; summit distinct, placed almost at the middle; anterior two-thirds with fine asperities becoming smaller posteriorly; posterior more than one-third shiny, punctate and without any hair; anterior and lateral areas with hairs.

Scutellum smooth and triangular, distinctly wider than long.

Elytra 1.60 times as long as pronotum and 1.40 times as long as its width; basal margins feebly ridged; lateral sides subparallel upto basal two-thirds, thence converging posteriorly with broadly rounded apex; disc weakly convex, striae marked by large distinct punctures, devoid of any microhair; interstriae flat, shiny and more than twice as wide as striae, with uniseriate granules increasing in size posteriorly and with erect hairs; basal area with only a few punctures. Declivity uniformly sloping and commencing slightly below the middle, face flatly convex; postero-lateral margins distinctly carinate and confluent with interstria 7, devoid of any granules; striae



**Fig. 45 :** *Euwallacea interjectus* (Blandford), Male : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

somewhat impressed marked by punctures; interstriae feebly elevated with uniseriate sparse granules and long erect hairs, granules on interstria 2 comparatively large. Procoxae contiguous, pro- and meso-tibiae with 9 and 11 teeth respectively.

*Male* : The morphology of male similar to that of female except in reduced size and light yellowish in colour. Other details very similar to that of males of *E. asperipennis* except in having declivital face plano-convex and postero-lateral margins devoid of any granules.

*Distribution* : INDIA : *Andamans* : North, Middle and South Andamans; *Assam* : Lakshimpur Dist., Upper Dihing Range, Sibsagar Dist., Nambur Reserve, North Cachar Dist., Halflong; *Kerala* : Cardamom Hills (800 m); *Madhya Pradesh* : Balaghat, Baihar

Range; *Magarashtra* : North and South Kanara; *Meghalaya* : West Garo Hills, Tura; *Sikkim* : Gangtok, Mantham; *Tamil Nadu* : Anaimalai Hills (1100 m), South Mangalore, Nilagiri : Hillgrove, Conoor River Valley; North Malabar, Kannothe Range; *Uttar Pradesh* : Dehra Dun, River Sarda Gorge, Kalagarh, Haldgaddi block; *West Bengal* : Jalpaiguri Dist., Jalpaiguri, Buxa; Darjiling Dist., Tista Valley; Jaldhaka Range, and Samsingh. ELSEWHERE : Myanmar, Nepal, Sri Lanka, Malaysia, Indonesia, (Sumatra, Java, Borneo and Mentawai Isl.), Philippines, Taiwan, China, Tonkin, Vietnam and Japan.

*Hosts* : As many as 41 hosts are known from the Indian subregion (Beeson, 1930 and 1941).

However, three hosts, namely, *Calophyllum spectabile*, *Canarium euphyllum* and *Pterocymbium tinctorium* have been recorded from the Bay Islands (Maiti and Saha, 1986). Three more hosts, namely, *Anthocephalus indicus*, *A. chinensis* and *Elaeocarpus lanceaefolius* from West Bengal have been added (Saha and Maiti, 1996).

*Remarks* : The species shows inter-colonial variations to a large extent. The colour varies from yellowish brown to pitchy black, as also the size within a certain limit. The characteristic large granules on declivital interstria 2 are sometimes not even indential on each elytron. Likewise, the stria punctures on the elytral declivity are large and closely placed, while in others, those are small and widely placed.

This fairly large shot-hole borer is widely distributed in the Old World tropics. It is a very common species infesting numerous host plants in the wetter parts of tropical India including the islands of Andaman (Beeson, 1930). The species usually infests the injured trees and recently felled logs in India. The biology of the species with special reference to its host plants, tunnel system, nesting habits, etc., has been studied by Beeson (1930 and 1941) in India; Browne (1961) in Malaysia and Sri Lanka.

#### 45. *Euwallacea malloti* (Eggers)

(Fig. 46)

##### 1. *Xyleborus malloti* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 192, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Uttar Pradesh, India.

1979. Schedl, *Nat. Mus. Wien. Entomologie*, 3 (2) : 147.

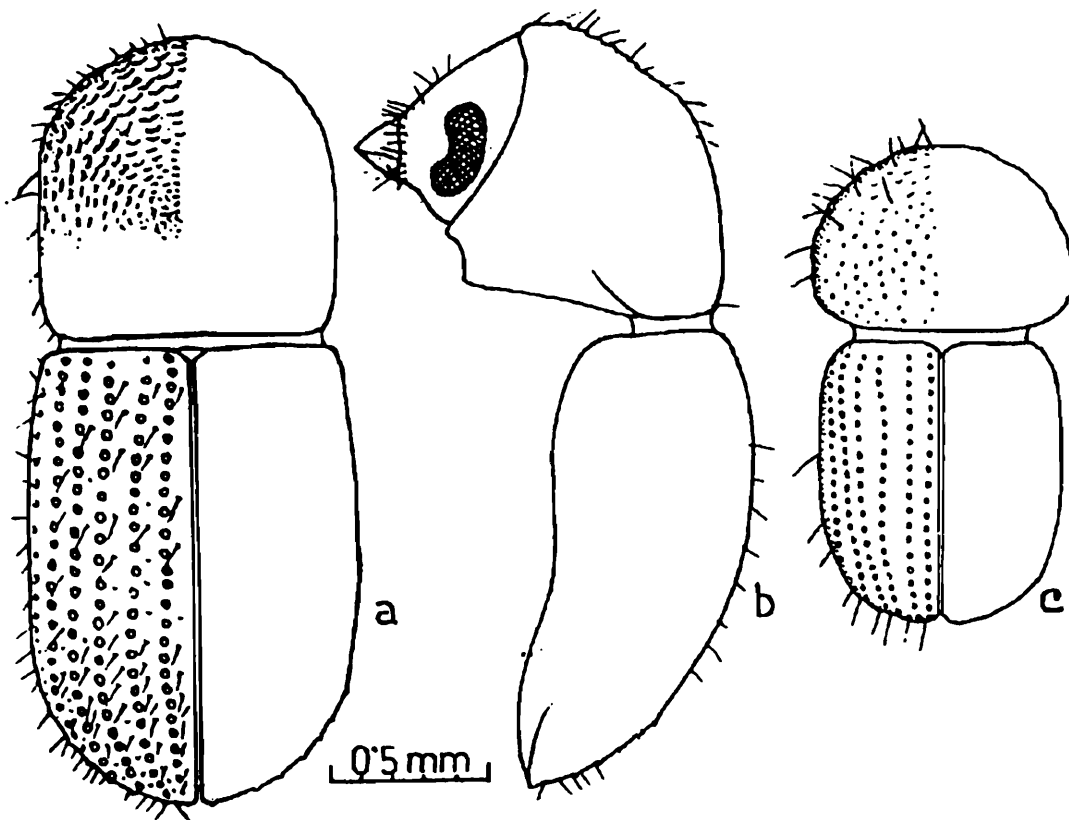
##### 2. *Euwallacea malloti* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 692.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 813, 817

2000. Saha and Maiti, *State Fauna Series 4 : Fauna of Meghalaya*, Part 5 : 646, 647.

*Description* : *Female* : Body short and stout; head, pronotum, antennae and legs yellowish brown; elytra slightly darker. Body length 2.40 mm, 2.2 times as long as wide.



**Fig. 46 :** *Euwallacea malloti* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; Male : c, pronotum and elytra in dorsal view.

Head globose; frons plano-convex, devoid of any median line, but medially slightly elevated; surface shiny with sparse punctures and hairs, except median smooth area. Eyes broadly emarginate nearly one-thirds of its width. Basal corneous portion of antennal club reduced with substraight apical margin; on truncated face, segment 2 chitinised; posterior face with one suture, other one obscure:

Pronotum subquadrate; as long as wide; lateral sides weakly outcurved, anterior margin broadly rounded and armed with a few transverse asperities; more than anterior half with transverse weak asperities; posterior portion smooth.

Scutellum triangular and distinctly wider than long.

Elytra 1.5 times as long as pronotum; 1.33 times as long as its width; basal margin with feeble transverse ridge; lateral sides weakly outcurved, apex broadly rounded; discal striae marked by close distinct punctures; interstriae flat and shiny with uniseriate row of indistinct granules except towards base and with erect hairs. Declivital slop gradual; face convex; striae 1, 2 and 3 feebly impressed, but with more distinct and close punctures; interstriae with fairly conspicuous sparse granules and long erect hairs; postero-lateral margins acute, but not carinate, with interrupted line marked by indistinct granules. Procoxae contiguous, protibiae with 8 and both meso- and meta-tibiae with 10 teeth.

*Male* : Males are somewhat like females, but in profile more convex, colour pale brown; body length 1.65 mm, nearly twice as long as wide.

Frons plano-convex, feebly elevated medially at the level of eyes; surface finely reticulate and with distinct punctures and erect hairs.

Pronotum subglobose, gradually convex from base towards apex; anterior margin unarmed; anterior half with a few weak asperities and long fine hairs; posterior half with distinct punctures and fine small hairs.

Elytra more convex; strial punctures on disc large and distinct; interstriae with minute punctures; declivital face flat; striae 1 and 2 feebly impressed; interstriae with long erect hairs, more distinct at declivital face.

*Distribution* : INDIA : *Meghalaya* : West Garo Hills, Tura; *Uttar Pradesh* : Dehra Dun, Siwaliks; *Tamil Nadu*; *West Bengal* : Darjiling Dist : Samsingh and Tista Valley, Jalpaiguri Dist., Gazalduba. ELSEWHERE : Bangladesh.

*Hosts* : *Eugenia formosa*, *Mallotus philippinensis*, *Phoebe hainesiana*, *Tinospora cordifolia* (Beeson, 1930 and 1941; Saha and Maiti, 1996).

*Remarks* : This is the smallest species of the genus *Euwallacea* and occurs sparsely in the sub-Himalayan tracts of Uttar Pradesh and West Bengal. It comes very close to *E. fornicatus* (Eichhoff), but differs in some minor characters (vide, under *E. fornicatus*).

#### 46. *Euwallacea piceus* (Motschulsky) (Fig. 47)

##### 1. *Anodius piceus* Motschulsky

1896. *Bull. Soc. Imp. Nat. Moscou*, **36** (1) : 512. *Type-locality* : Sri Lanka.

1969. Wood, *Gt. Basin Nat.*, **29** (3) : 117.

##### 2. *Xyleborus piceus* (Motschulsky)

1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 109.

1978. Browne, *Oriental Ins.*, **12** (4) : 611.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 132-135.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 831-835.

##### 3. *Euwallacea piceus* (Motschulsky)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 692-693.

##### 4. *Xyleborus indicus* Eichhoff

1878/79. Eichhoff, *Mem. Soc. Roy. Sci. Liege*, **8** (2) : 354-355, Female. *Type-locality* : Java, Indonesia. *Type* : In Mus, Paris.

1950. Schedl, *Rev. France Ent.*, **17** : 214, Male, Tvong Cost, Adiopodoume.

1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 56-57.

1969. Wood, *Gt. Basin Nat.*, **29** (3) : 117 (Synonymy).

1971. Schedl, *Steenstrupia*, **1** : 149.

#### 5. *Xyleborus imitans* Eggers

1927. Eggers, *Treubia*, **9** : 404-405, Female. *Type-locality* : Montawei Island (Si Oban), Indonesia.

#### 6. *Xyleborus indicus* Eichh. var. *subcoriaceus* Eggers

1927. Eggers, *Philipp. J. Sci.*, **33** : 92, Female. *Type-locality* : Mount Santo Toams, Philippines.

#### 7. *Xyleborus samoensis* Beeson

1929. Beeson, *Brit. Mus. nat. Hist.*, **4** (4) : 237-238. Female. *Type-locality* : Samoa.

1951. Schedl, *B.P. Bishop Mus., Occ. Paper*, **20** (10) : 137.

1960. Wood, *B.P. Bishop Mus.*, **18** (1) : 61 (Synonymy).

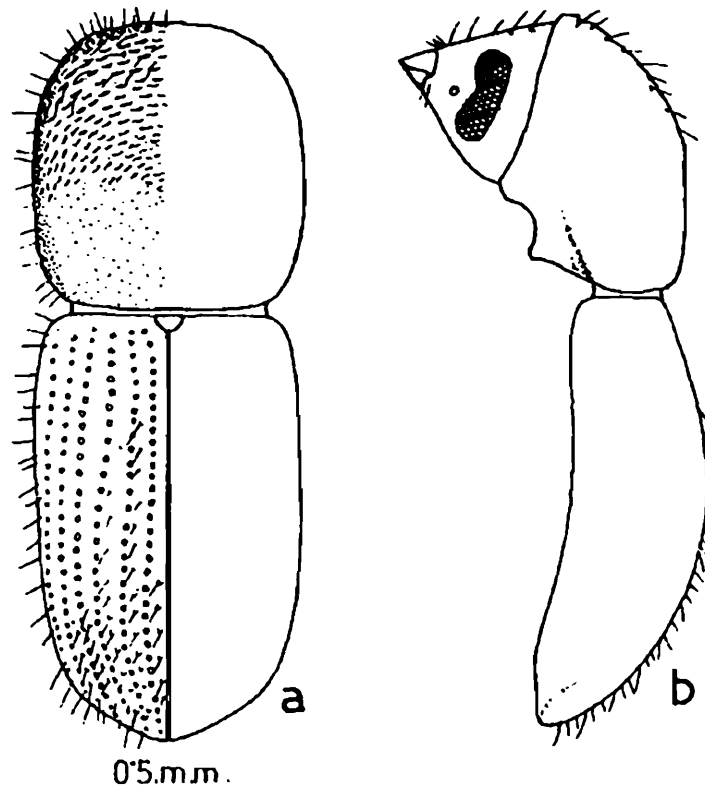
*Description : Female* : Body short and cylindrical; head, pronotum and elytra dark brown to blackish brown; antennae and legs much paler. Body length 2.10-2.25 mm and body 3 times as long as wide.

Head globose; frons plano-convex, weakly elevated medially, median line prominent anteriorly, surface finely reticulate with a few indefinite large punctures; vestiture inconspicuous. Eyes elongately oval and about half its width emarginate. Antennae not studied.

Pronotum subquadrate, nearly 1.2 times as long as wide; basal margin substraight; lateral and anterior margins weakly outcurved, anterior margin unarmed; indistinct summit near the middle; anterior declivous portion with small asperities; posterior half reticulate and minutely punctate; vestiture only conspicuous on anterior one-third.

Scutellum small and subround.

Elytra 1.7 times as long as wide and 1.5 times as long as pronotum; lateral sides straight and subparallel on basal two-thirds; postero-lateral angles broadly rounded with somewhat interrupted acute margins marked by small granules; discal striae feebly marked by small and shallow punctures, stria 1 feebly impressed; interstriae flat and shiny, wider than striae with inconspicuous punctures and hairs. Declivity commencing slightly below the middle, face gradually sloping and weakly convex; striae with comparatively larger punctures, striae 1, 2, 3 feebly impressed; interstriae weakly elevated with uniseriate row of granules and erect hairs. Procoxae contiguous, protibiae with 9 and both meso- and meta-tibiae with 9-10 teeth on each.



**Fig. 47 :** *Euwallacea piceus* (Motschulsky), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

*Male* : Male not available for study.

*Distribution* : INDIA : West Bengal, and Andaman and Nicobar Islands.  
ELSEWHERE : Oriental and Ethiopiana Regions.

*Hosts* : *Artocarpus integrifolia*, *Diospyros pyrrocaroa*, *Gmelina arborea*, *Sterculia alata*, *Pterocymbium tinctorium*, etc.

*Remarks* : As it stands to day, *E. piceus* seems to be a very variable and wide spread species in the Oriental and Ethiopian Regions. In the recent past, it had been transferred to *Euwallacea* by Wood and Bright (1992). This had escaped the notice of Saha and Maiti (1996) who had erroneously continued to consider the species under *Xyleborus*.

The knowledge of biology of the species is limited to the host records only made by Beeson (1930 and 1941) in India and Browne (1961) in Malaysia.

#### 47. *Euwallacea sibsagaricus* (Eggers)

(Fig. 48)

##### 1. *Xyleborus sibsagaricus* (Eggers)

1930. Eggers, *Indian Forest Rec.*, (*Ent.*) 14 (9) : 196, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Nambur Reserve, Sibsagar Dist., Assam, India.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 309 p.

## 2. *Euwallacea sibsagaricus* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 693.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 813, 818.

## 3. *Xyleborus dalbergiae* Eggers

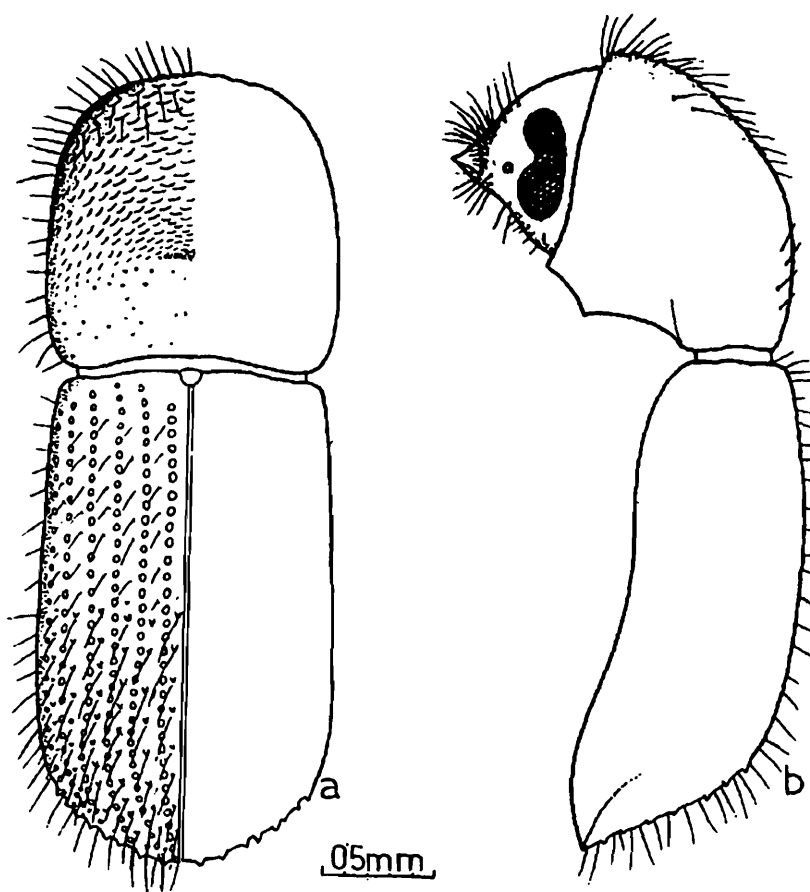
1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 196-197. *Type-locality* : Upper Dihing Reserve, Lakhimpur Dist., Assam.

1930. Beeson, *Indian Forest Rec.*, 14 (10) : 232.

1989. Wood, *Gt. Basin Nat.*, 49 : 173.

*Description : Female* : Body long and cylindrical; head, pronotum and elytra reddish brown in colour; legs and antennae paler. Body length 3.40-3.55 mm, 2.75 times as long as wide.

Frons plano-convex, surface finely reticulate, median line distinct, shiny and its either side weakly impressed just above epistomal margin; surface with close, large punctures and erect hairs. Antennal club somewhat obliquely truncate; on anterior face, basal corneous portion with substraight apical margin; truncated face with segment 2 chitinised; posterior face with one distinct suture, other one obscure.



**Fig. 48** : *Euwallacea sibsagaricus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum slightly longer than wide; lateral sides subparallel; anterior margin broadly rounded and unarmed; summit distinct, placed almost at the middle; anterior two-thirds with fine weak asperities, a few extending postero-laterally; posterior one-third shiny and sparsely hairy along with minute punctures throughout.

Scutellum triangular and broadly rounded posteriorly.

Elytra 1.50-1.60 times as long as pronotum, 1.75 times as long as its own width; lateral sides subparallel upto anterior three-fourths, apex rather broadly rounded; discal striae marked by shallow close punctures without any microhair; interstriae flat, smooth with uniseriate row of granules increasing in size towards declivity and with long erect hairs. Declivital slop rather abrupt; face plano-concave, commencing on posterior fourth; striae rather with close distinct punctures; interstriae with sparse granules and long erect hairs as one disc; postero-lateral margins acute, not carinate, but lined by a few granules. Procoxae contiguous; protibiae with 5 and meso-tibiae with 7 teeth.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Lakhimpur, Sibsagar Dist., Nambur Reserve. West Bengal : Darjiling Dist., Samsingh. ELSEWHERE : Tonkin.

*Hosts* : *Casearia glomerata*, *Ehretia acuminata* and *Sapium eugineafolium*.

*Remarks* : The examination of types of *Xyleborus sibsagaricus* and *X. dalbergiae*, both deposited in F.R.I., Dehra Dun, described from Assam by Eggers (1930) in the same paper, had convinced the authors to agree with Wood (1989) who had synonymised the later under the former species. The more convex pronotum and elytra, as well as slightly smaller size of *X. dalbergiae* hardly deserve the status of a separate species, but these may be treated as variations in different population existing elsewhere other than its type locality.

#### 48. *Euwallacea tristis* (Eggers)

(Fig. 49)

##### 1. *Xyleborus tristis* Eggers

1930. Eggers, *Indian Forest Rec.*, (Ent.), 14 (9) : 194, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Sibsagar, Assam, India.

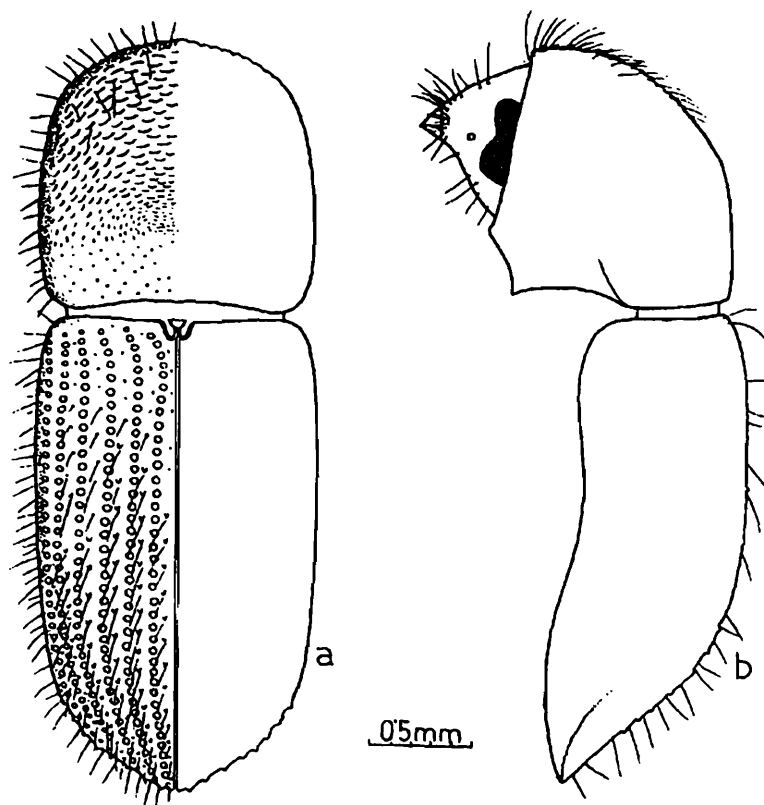
1930. Beeson, *Indian Forest Rec.*, 14 (9) : 86.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 310 p.

##### 2. *Euwallacea tristis* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 694.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 818-819.



**Fig. 49 :** *Euwallacea tristris* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

*Description : Female :* Body long and cylindrical; head, pronotum and elytra reddish brown to complete black; antennae and legs paler. Body length 3.80-3.90 mm, 2.7 times as long as wide.

Frons plano-convex, surface finely reticulate, except a smooth, elevated median line, its either side feebly impressed above epistoma; surface with close irregular punctures and long erect hairs, sparsely puncture towards vertex. Antennal club somewhat obliquely truncate, basal corneous portion reduced with weakly recurved apical margin; truncated face with segment 2 chitinised; posterior face with one suture, other one obscure.

Pronotum subquadrate; as long as wide or slightly longer; lateral sides subparallel on basal two-thirds; anterior margin broadly rounded and unarmed; summit at the middle; more than anterior half with weak transverse asperities in crescentic rows gradually becoming smaller posteriorly and a few extending postero-laterally; posterior one-third shiny with minute sparse punctures and inconspicuous hairs.

Scutellum smooth, small and subround, surface convex, pronounced scutellar space margined by 'U' shaped ridge.

Elytra 1.7-1.8 times as long as pronotum and 1.7 times as long as its width; lateral sides subparallel upto basal two-thirds, converging posteriorly, each elytral apex

narrowly rounded discal striae marked by shallow punctures, devoid of any microhair; interstriae smooth and shiny with uniseriate granules increasing in size towards posteriorly and with long erect hairs, a few punctures towards the base. Declivital slop gradual, face flatly convex, comparatively flat on lower half; posterolateral margins acute, not carinate, but with a few sparse granules; striae weakly impressed with comparatively close large punctures; interstriae with uniseriate sparse granules and erect hairs. Procoxae contiguous; protibiae with 6 and both meso- and meta-tibiae with 8-10 teeth.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Sibsagar; West Bengal : Darjiling Dist. : Samsingh. ELSEWHERE : None.

*Host* : *Vatica lanceaefolia* and *Macatanga denticulata*.

*Remarks* : This is a least known species in India, so far recorded only from the eastern India. The species can easily be separated from all other Indian species of *Euwallacea* by pronounced scutellar space margined by 'U' shaped ridge. Colour generally varies from reddish brown to complete black. The teeth on meso- and meta-tibiae vary considerably in number even in the same specimen.

#### 49. *Euwallacea velatus* (Sampson)

(Fig. 50)

##### 1. *Xyleborus velatus* Sampson

1913. Sampson, *Ann. Mag. nat. Hist.*, 12 (8) : 443, *Holotype* : B.M. Nat. Hist., London. *Type-locality* : Tharrawaddy, Lower Myanmar

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 310 p.

1970. Schedl, *Kontyu*, 38 (4) : 355.

##### 2. *Euwallacea velatus* (Sampson)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 85* : 91-93, Fig. 23, a and b.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 694-695.

##### 3. *Xyleborus assamensis* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 19, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Shilong, Meghalaya, India.

1930. Beeson, *Indian Forest Rec.*, 14 (10) : 51.

##### 4. *Xyleborus asperipennis* (nom. nov. of *Xyleborus assamensis*)

1934. Egger, *Ent. Nach.*, 8 : 2.

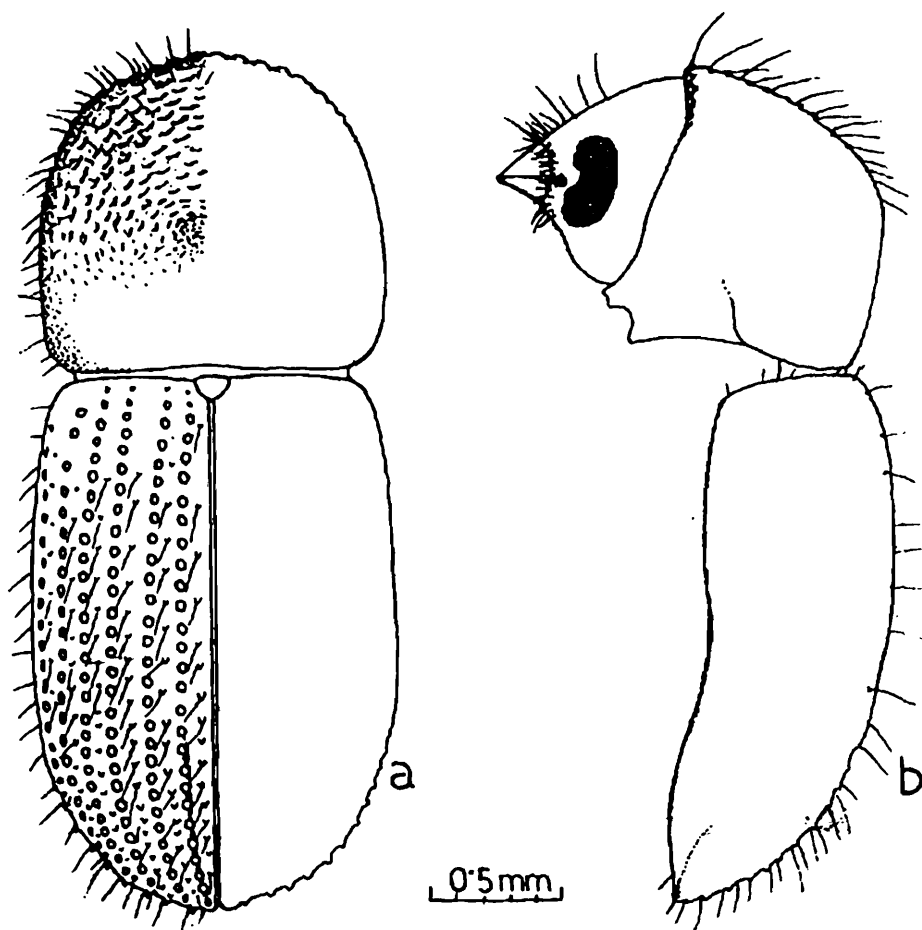
1977. Kumar and Chandra, *Oriental Ins.*, 11 (1) : 32, Male, West Bengal, India.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 694 (Synonymy).

6. *Euwallacea asperipennis* (Eggers)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 813, 814.

*Description : Female* : Body broadly elongate, head, pronotum antennae and legs brown; elytra reddish brown to complete black. Body length 3.25-3.40 mm and 1.9 times as long as wide. But weakly elevated medially; rest of the surface with scattered punctures of irregular size and hairs laterally. Basal corneous portion of antennal club reduced with substraight apical margin; segment 2 somewhat distinct and chitinised.



**Fig. 50** : *Euwallacea velatus* (Sampson), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum subquadrate, 1.1 times as wide as long; lateral sides weakly curved and anterior margin broadly arched and armed with 6-7 distinct asperities, summit distinctly marked and placed almost at the middle; anterior declivous portion with distinct transverse asperities in crescentic rows, a few extending below the summit in granular form and with sparse bent hairs below the summit, disc shiny with a few indistinct granules, hairs inconspicuous except of few towards lateral sides.

Scutellum triangular and moderately shiny.

Elytra 1.50 times as long as its width; basal margin feebly ridged; lateral sides subparallel upto anterior three-fourths, thence converging posteriorly with somewhat narrowly rounded apex; discal striae marked by close distinct punctures, devoid of any microhair; interstriae rather smooth and shiny, 2-3 times as wide as striae, with uniseriate sparse granules, each with a long erect hair, a few punctures towards elytral base. Declivity commencing below the middle; face plano-convex; striae marked by shallow punctures, sutural striae comparatively impressed; interstriae with large granules each with a long erect hair; postero-lateral margins not with carinae, but with sharp margins and with distinct granules gradually becoming smaller towards apex. Protibiae with 11 and meso- and meta-tibiae with 13-14 teeth.

*Male* : Body much reduced, somewhat different from that of the female; head, pronotum and elytra light yellowish to yellowish brown; entire body with fairly dense long hairs. Body length 1.95-2.00 mm.

Head concealed under pronotum upto the extent of lower level of eyes; lateral sides subparallel; frons plano-convex, smooth and shiny with sparse hairs.

Pronotum subquadrate with weakly outcurved lateral margins and converging anteriorly; anterior margin medially emarginate in profile, dorsal surface uniformly arched and summit not distinctly marked; anterior declivous portion with small asperities, scattered throughout the surface except sparsely so on longitudinal depressed area above the middle; posterior half with minute scattered granules and punctures.

Elytra 1.5 times as long as and slightly wider than pronotum; lateral sides weakly outcurved, widest at basal third, thence gradually narrowing posteriorly and terminating into fairly rounded apex; elytral disc somewhat convex, sparsely hairy. Declivity commencing on basal fourth, gradually sloping posteriorly; surface somewhat flat; elytral striae and interstriae as in females, but less pronounced.

*Distribution* : INDIA : Assam : Lakhimpur Dist., Upper Dihing Reserve; North Cachar Hills Dist., Halflong; Andaman Island : North Andaman; Meghalaya : Khasi Hills Dist., Shilong; Nagaland; Sikkim; West Bengal : Darjiling Dist. : Mongphu, Kalimpong, Rangirum, Debrepani, Samsingh, Senchal Range and Tista Valley; Uttar Pradesh. ELSEWHERE : Myanmar, China (Xizang).

*Hosts* : *Acer campbelli*, *Acrocarpus fraxinifolius*, *Albizia* sp., *Caseari glomerate*, *Elaeocarpus lanceaefolius*, *Eurya japonica*, *Gmelina arborea*, *Juglans regia*, *Lasiococca* sp., *Leucosceptrum canum*, *Macaranga denticulata*, *Machilus odoratissima*, *Phoebe haineseana*, *Quercus flauca* and various unidentified timbers (Beeson, 1930 and 1941 and Saha and Maiti, 1992).

*Remarks* : The species was originally described as *Xyleborus valatus* by Sampson (1913) from lower Myanmar which was latter on transferred to the genus *Euwallacea* by Maiti and Saha (1989) and Wood and Bright (1992). However, quite a number of species has been synonymised under it.

50. *Euwallacea wallacei* (Blandford)  
(Fig. 51)

1. *Xyleborus wallacei* Blandford

1896. Blandford, *Trans. ent. Soc. Lond.*, pp. 220, *Holotype* : Females in *B.M. Nat. Hist.*, London.  
*Type-locality* : New Guinea, Dorey.

2. *Euwallacea wallacei* (Blandford)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 695.

3. *Xyleborus gravelyi* Wichmann

1914. Wichmann, *Rec. Indian Mus.*, 8 : 411. *Type-locality* : Kobo, Myanmar.

1941. Beeson, *Ecology and Control of Forest Insects of India and Neighbouring Countries*, 305 p.

4. *Euwallacea gravelyi* (Wichmann)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 813, 815.

5. *Xyleborus ovalicollis* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* 14 (9) : 17, Female. *Type-locality* : Lakhimpur, Assam, India.

1989. Wood, *Gt. Basin Nat.*, 49 : 695 (Synonymy).

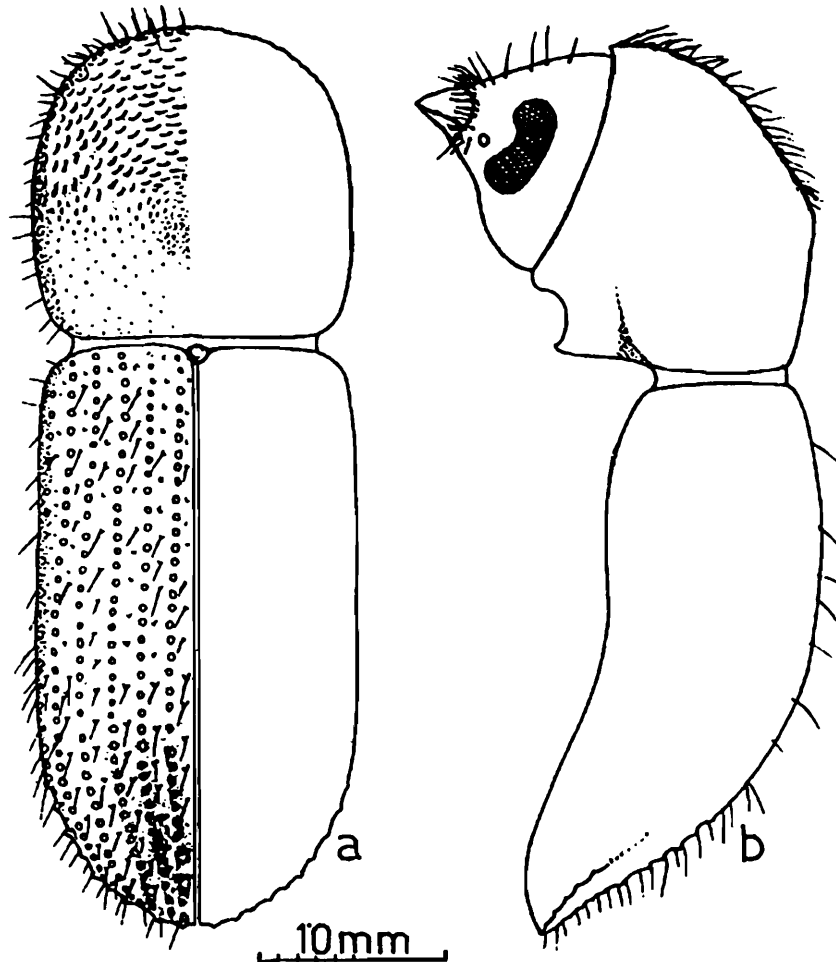
*Description* : *Female* : Body long and cylindrical; body yellowish brown to reddish brown, elytra sometimes darker. Body length 4.00-5.00 mm, 2.8 times as long as wide.

Frons plano-convex, median line distinct and on its either side weakly impressed just above epistomal margin; surface finely reticulate with shallow irregular close punctures and long erect hairs. Basal corneous portion of antennal club with substraight apical margin; on truncate face, segment 2 chitinised; posterior face with one distinct suture and other one obscure.

Pronotum subquadrate, as long as wide or slightly wider; lateral sides distinctly outcurved; anterior margin rounded and unarmed; distinct summit just below the middle; anterior declivous portion weakly convex and with weak transverse asperities, extending usually postero-laterally and with long hairs; posterior one-third shiny and with minute sparse punctures, hairs inconspicuous, except laterally.

Scutellum subround and shiny.

Elytra 1.7 times as long as pronotum and 1.6 times as long as its width; lateral sides subparallel upto basal two-thirds, thence strongly narrowing posteriorly with



**Fig. 51 :** *Euwallacea wallacei* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in dorsal view.

narrowly rounded apex; discal striae marked by shallow and close punctures without having any microhair; interstriae flat and shiny with uniseriate granules increasing in size towards elytral apex and with long erect hairs; a few indistinct punctures sometimes visible near base and towards humeral angles. Declivity gradually sloping with weak depression much below the middle, face somewhat flatly convex; striae comparatively impressed with distinct close punctures; interstriae with sparse granules and long hairs as on disc; postero-lateral margins acute, but not carinate and with a few sparse granules. Protibiae with 7 and both meso- and meta-tibiae with 9-10 teeth.

*Male* : Body almost similar to that of female except reduced in size, paler in colour, comparatively densely hairy. Pronotum subquadrate with weakly outcurved lateral and anterior margins and with small and sparse asperities. Elytral striae marked by comparatively small punctures.

*Distribution* : INDIA : Assam : Lakhimpur Dist. : Upper Dihing Reserve; West Bengal : Darjiling Dist. : Debrepani, Lepchajagat, Lopchu, Rangirum, Samsing and Senchal Range. ELSEWHERE : Myanmar.

*Hosts* : *Artocarpus lakoocha*, *Bilschmiedia sikkimensis*, *Casearia glomerata*, *Cinnamomum cecicodaphne*, *Evodia fraxinifolia*, *Leucosceptrum canum*, *Machilus odoratissima*, *Mallotus roxburghianus*, *Macaranga denticulata*, *Ostodes paniculata*, *Sterculia colorata*, *Symplocos theaefolia*, *Turpinia* sp.

*Remarks* : *Xyleborus wallacei* has been a very sparsely known species, since its first description by Blandford (1896). Recently, Wood and Bright (1992a) had transferred the species to the genus *Ewallacea* and also synonymised *E. graveleyi* under it. However, another Indian species *X. ovalicollis* had been studied and compared by Saha and Maiti (1996) to the types of *X. graveleyi* present in Z.S.I., Kolkata and synonymised it under *X. graveleyi*. As such, both the species are now in the synonymy list of *E. wallacei*.

### 51. *Ewallacea xanthopus* (Eichhoff)

(Fig. 52)

#### 1. *Xyleborus xanthopus* Eichhoff

1868. Eichhoff. *Berl. ent. Z.*, **12** : 151, *Holotype* : Female : Hampurg Museum (lost). *Type locality* : Africa.

#### 2. *Ewallacea xanthopus* (Eichhoff)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 695-697.

#### 3. *Xyleborus rudis* Eggers

1930. Eggers, *Indian Forest Rec.*, (*Ent.*) **14** (9) : 192-193, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Madras : Nilambur.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 696 (Synonymy).

1961. Browne, *Malay. Forest Rec.*, no. 22 : 127.

*Description* : *Female* : Body stout and cylindrical; colour reddish brown to blackish brown, head and pronotum comparatively darker. Body length 3.00 mm, 2.3 times as long as wide.

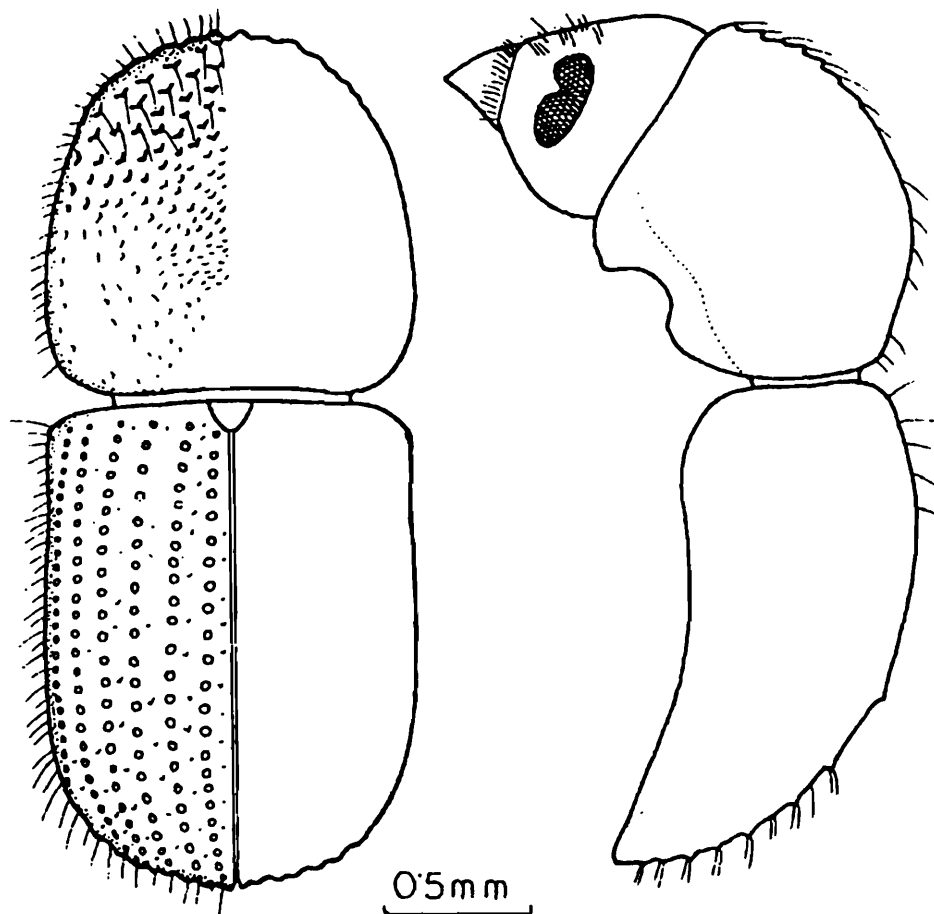
Frons flatly convex with feebly elevated median area; surface finely reticulate with sparse small punctures and long hairs, granulate towards epistomal margin. Eye and antennae as in *A. asperatus*.

Pronotum subglobose, nearly as wide as long; anterior margin with a few weak asperities, summit distinct and placed nearly at the middle; asperities on anterior half transverse and distinct, weak asperities around the summit and extending upto the posterior margin.

Scutellum tongue-shaped.

Elytra about 1.3 times as long as and as wide as pronotum; lateral sides subparallel upto basal two-thirds, broadly rounded posteriorly; discal striae not impressed marked

by shallow punctures, devoid of any microhair; interstriae nearly thrice as wide as striae marked by uniseriate setaeferous sparse granules except a few punctures towards base. Declivital face gradually sloping, declivity commencing on posterior half; striae impressed, punctures rather closer than on disc; interstriae feebly elevated, except interstria 1; interstria 1 devoid of any granules or tubercles except at the summit; all other interstriae upto 6 with sparse uniseriate small and large setaeferous granules, those on interstriae 2 and 3 rather large. Protibiae with 7 and meso- and meta-tibiae with 9 teeth.



**Fig. 52 :** *Euwallacea xanthopus* (Eichhoff), a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

*Male* : Unknown.

*Distribution* : INDIA : Kerala, Nilambur. ELSEWHERE : Malaysia and Sri Lanka.

*Hosts* : *Artocarpus integrifolia* (South India and Sri Lanka) and *Shorea leprosula* (Malaysia).

*Remarks* : The species is quite rare in India and so far known only from South India infesting a single host. It was originally described under the genus *Xyleborus* which was latter on treated under *Euwallacea* group of *Xyleborus* (Browne, 1961).

Genus *Hadrodemius* Wood1. *Hadrodemius* Wood

1980. Wood, *Gt. Basin Nat.*, 40 (1) : 94.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 818.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 819.

*Type of genus : Hadrodemius : Xyleborus globus* Blandford.

The genus *Hadrodemius* was erected by Wood (1980) to accommodate the species *Xyleborus globus* Blandford from New Guinea. It is very close to *Eccoptopterus* Eichhoff in having costate apical margin of basal corneous portion of antennal club and scutellum visible only on the declivous slope of elytral basal margin. But it can be easily differentiated from *Eccoptopterus* by its normal size of tibiae with socketed teeth, noncompressed metatarsi, unarmed elytral declivity, etc.

**General characters of the genus *Hadrodemius* Wood.**

*Description : Female* : Body stout and densely hairy throughout or atleast at declivital face; colour reddish brown to completely black. Body length 5.40-5.80 mm, 1.7-1.8 times as long as wide.

Frons plano-convex, surface rugose with irregular shallow punctures and long erect hairs, sometimes hairs inconspicuous, except small median smooth area just above epistoma. Eyes elongately oval and feebly emarginate. Antennal scape long and slender, funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring, truncated face with two more sutures; posterior face devoid of any suture.

Pronotum somewhat dome-shaped, about 1.10-1.25 times as wide as long; basal margin substraight or medially broadly emarginate (*H. pseudocomans*); lateral sides feebly outcurved, anterior margin feebly produced bearing 5-8 distinct asperities, of which middle two largest; dorsum strongly convex with distinct transverse summit nearly at the middle; anterior declivous portion with distinct asperities in transverse rows; posterior portion granulately punctate; entire pronotum with both long and short hairs; postero-median portion with band of hairs.

Scutellum visible only on anterior declivous slope of elytral basal margin.

Elytra nearly as long as or slightly longer than pronotum; basal margin substraight; lateral sides feebly outcurved, gradually rounded posteriorly to broadly rounded apex, postero-lateral margins marked by some granules; discal striae marked by minute shallow punctures, each with a microhair; interstriae much wider than striae with irregular punctures and long erect hairs. Declivity commencing almost from the middle of elytra; declivital face either plano-convex or plano-concave or convex; in the area of striae and interstriae 1, 2 and 3, the surface rather opaque; strial punctures indistinct, each with a microhair; interstriae much wider than striae; interstriae generally with granules of irregular sizes, interstitial surface with sparse, erect and stout hairs. Procoxae contiguous; protibiae with 7 and both meso- and meta-tibiae with 12 teeth.

**Key to the species of *Hadrodemius* Wood based on females**

1. Declivital face strongly concave in the area of striae and interstriae 1, 2 and 3; striae indistinctly marked, interstriae with large granules particularly on the margin of concavity and with sparse erect and stout hairs; body length 5.50 mm ..... *H. pseudocomans* (Eggers)
- Declivital face either plano-concave or plano-convex, striae distinctly marked or inconspicuous; interstriae with small granules and dense coat of long recumbent hairs ..... 2
2. Declivital face plano-concave in the area of striae and interstriae 1, 2 and 3; strial puncture more distinct on declivital face; body length 5.40-5.50 mm ..... *H. metacomans* (Eggers)
- Declivital face plano-convex; declivital face more densely hairy; strial puncture inconspicuous on declivital face; body length 5.70-5.80 mm .... *H. globus* (Blandford)

**52. *Hadrodemius globus* (Blandford)**

**1. *Xyleborus globus* Blandford**

1896. Blandford, *Trans. ent. Soc. London*; pp. 208-209; *Type* : in *B.M. Nat. Hist.*, London.  
*Type-locality* : New Guinea.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 105.
1975. Schedl, *Revue suisse Zool.*, **82** (3) : 451.
1975. Beaver and Browne, *Oriental Ins.*, **9** (3) : 298.

**2. *Hadrodemius globus* (Blandford)**

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 819.

*Description : Female* : Body large and stout, densely hairy on declivital face; head, pronotum and elytra completely black. Body length 5.70-5.80 mm, 1.8 times as long as wide.

Frons plano-convex and surface rugose with irregular shallow punctures, hairs inconspicuous, small smooth median area just above epistoma.

Pronotum dome-shaped, about 1.10 times as wide as long; lateral sides feebly outcurved, anterior margin feebly produced bearing 5-6 distinct asperities, of which middle two largest; dorsum strongly convex with distinct transverse summit nearly at the middle; anterior declivous portion with distinct asperities in transverse rows, gradually decreasing in size posteriorly; posterior portion granulately punctate; hairs distinct on anteriorly and laterally; postero-median margin with yellowish band of hairs.

Elytra 1.1 times longer than pronotum and as wide as pronotum; lateral sides feebly outcurved and posterior margin broadly rounded; postero-lateral margins marked

by some granules; discal striae marked by moderately distinct punctures, each with a microhair; interstriae flat much wider than striae with irregular punctures, hardly distinguishable from strial punctures and with long erect hairs. Declivital face convex; strial puncture indistinct, but each with a microhair; interstriae with irregular small granules and dense coat of small and long recumbent hairs.

*Male* : Material not available for study.

*Distribution* : INDIA : Kerala : Kardamom Hills (800 m). ELSEWHERE : Indonesia (Borneo, Java and Sumatra), Malaysia, New Guinea, Philippines, Solomon Is., Taiwan and Thailand.

*Remarks* : The species is so far only known from Kerala, India, although it is widely distributed throughout the Orient. However, it is closely related to *H. metacomans*, from which it differs in having declivital plano-convex face. Not a single host is recorded from India, although numerous hosts are on record from the Oriental Region (Browne, 1961).

### 53. *Hadrodemius metacomans* (Eggers)

(Fig. 53)

#### 1. *Xyleborus metacomans* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 12, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Halflong, Assam, India.
1934. Gardner, *Indian Forest Rec., (Ent.)*. 28 : 16.
1977. Kumar and Chandra, *Oriental Ins.*, 11 (1) : 35, Male.

#### 2. *Hadrodemius metacomans* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 819.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 819, fig. 14, a-c.

*Description : Female* : Body stout and densely hairy; head, pronotum and elytra reddish brown to complete black. Body length 5.40-5.50 mm, 1.8 times as long as wide.

Frons plano-convex and surface rugose with irregular shallow punctures and long erect hairs, except small median smooth area just above epistoma.

Pronotum as in *H. globus*, but slightly more wider.

Elytra more or less as in *H. globus* except the characters given in the key.

*Male* : Body short and stout completely different from the female; head, pronotum and elytra straw yellow to light brown in colour; body length 4.2 mm.

Head concealed under the anterior projection of pronotum; head somewhat subrostrate; frons flat with a median longitudinal groove running posteriorly; entire

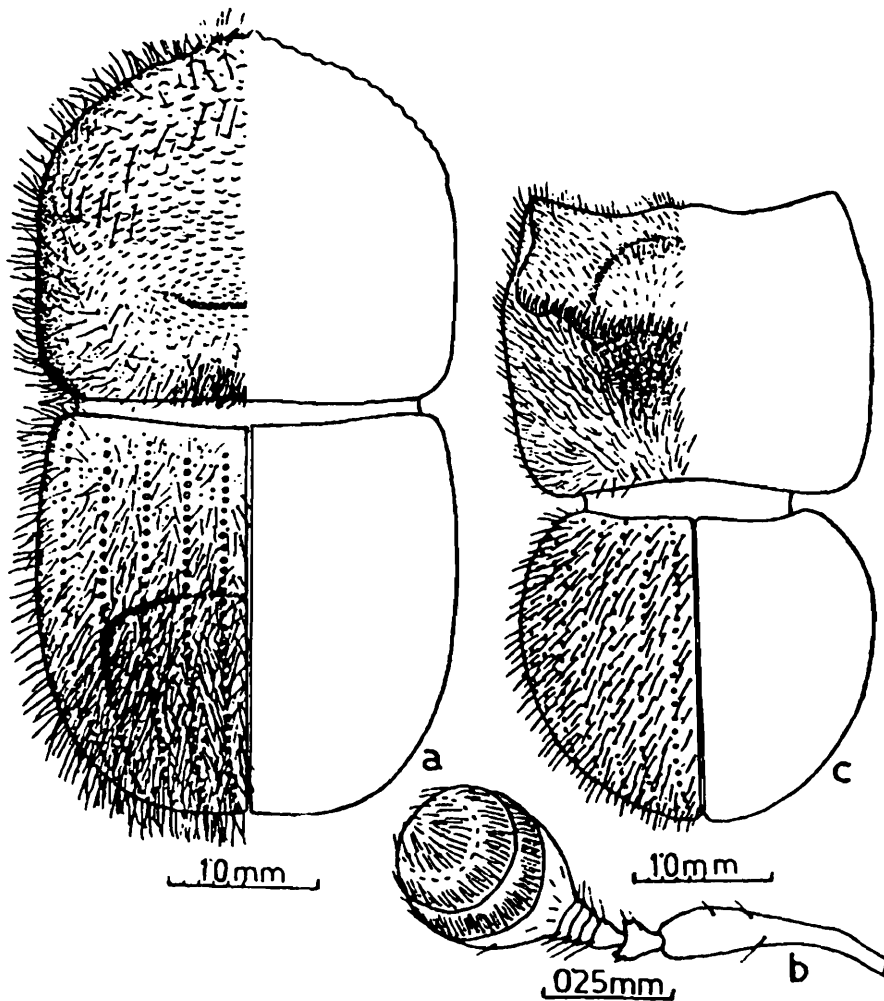


Fig. 53 : *Hadrodemius metacomans* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, antenna. Male : c, Pronotum and elytra in dorsal view.

surface with irregular close shallow punctures on reticulate surface, moderately hairy, specially towards antero-lateral portions.

Pronotum much wider than long, including the anterior projection, lateral sides weakly convex, thence slightly narrowing anteriorly, anterior half of pronotum strongly projecting anteriorly like a truncate spoon with projecting antero-lateral corners; depressed median portion with a weakly convex area accommodating head on the ventral side; entire surface finely punctate and pilose with a median weak longitudinal groove. Elytra somewhat globose with substraight basal margin; striae marked by small punctures, but devoid of any microhair; interstriae with irregular small punctures and with admixture of small and long hairs.

*Distribution* : INDIA : Assam : Cachar, Halflong; West Bengal : Darjiling Dist., Samsingh; Jalpaiguri Dist., Buxa and Gazalduba. ELSEWHERE : Myanmar.

*Hosts* : *Clerodendron infortunatum*, *Ailanthus grandis*, *Terminalia myriocarpa*.

*Remarks* : The species is closely related to *Hadrodemius pseudocomans* (Eggers), but distinctly differs from it in having flatly concave declivital face. The species is

known to infest a number of hosts (Beeson, 1941), of which *Ailanthus grandis* is recorded here for the first time.

**54. *Hadrodemius pseudocomans* (Eggers)**  
(Fig. 54)

**1. *Xyleborus pseudocomans* Eggers**

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 12, *Holotype* : Female in F.R.I., Dehra Dun.  
*Type-locality* : Lakhimpur, Assam, India.
1969. Schedl, *Oriental Ins.*, 3 (1) : 54.
1975. Beaver and Browne, *Oriental Ins.*, 9 (3) : 300.

**2. *Hadrodemius pseudocomans* (Eggers)**

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 819.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 819-820.

*Description : Female* : Body stout and densely hairy; head black, pronotum and elytra reddish brown to complete black. Body length 5.50 mm, 1.7 times as long as wide.

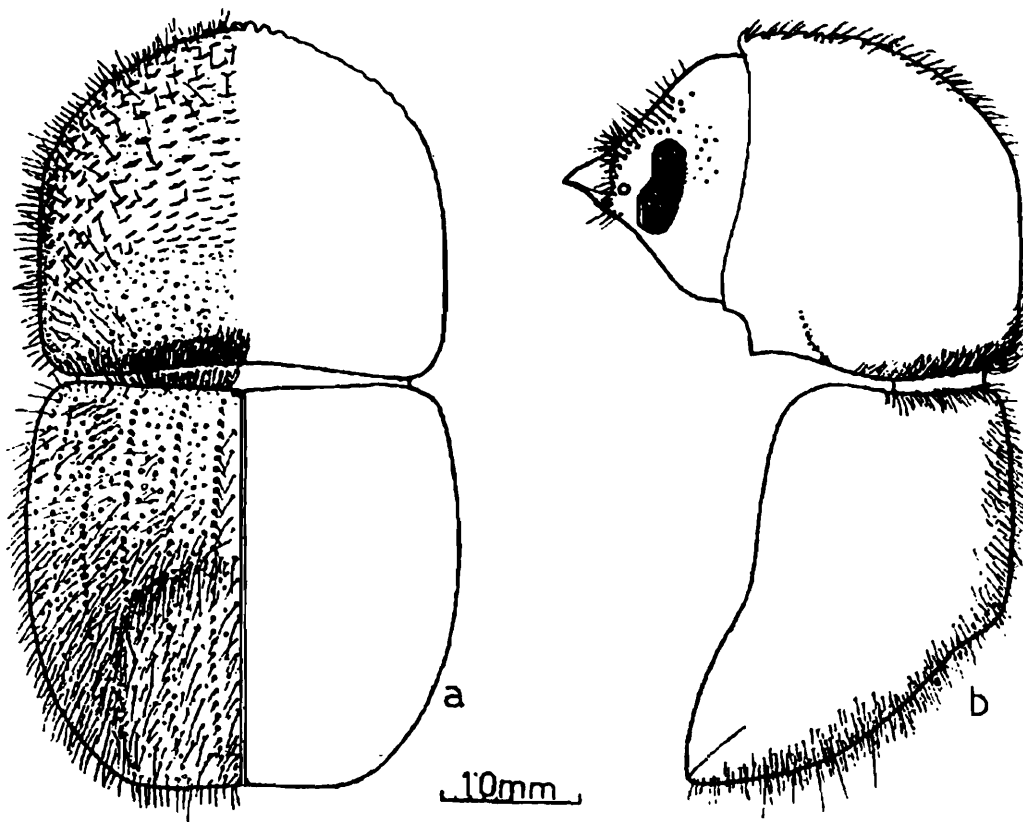
Frons plano-convex, surface rugose with irregular shallow punctures and long erect hairs, except small median smooth area just above epistoma.

Pronotum dome-shaped, 1.1 times as wide as long; basal margin substraight with broad median emargination, lateral sides feebly outcurved, anterior margin feebly produced bearing 6-8 distinct asperities, of which middle two largest; dorsum strongly convex, distinct transverse summit nearly at the middle; anterior declivous portion with distinct asperities in transverse rows, gradually decreasing in size posteriorly; posterior portion granulately punctate; entire pronotum with dense long and short hairs, and postero-median margin provided with blackish yellow band of hairs.

Elytra slightly longer and nearly as wide as pronotum; lateral sides feebly outcurved, posterior margin broadly rounded, postero-lateral margins marked by some granules; discal striae marked by minute, shallow punctures and each with a microhair; interstriae much wider than striae with irregular punctures and long hairs. Declivity commencing from the middle of elytra; declivital face strongly concave in the area of striae and interstriae 1, 2 and 3, and surface opaque; striae indistinctly marked by small punctures, each with a microhair; interstriae with granules of irregular size, those on margin of concavity rather large; interstitial surface with sparse erect and stout hairs, those of declivital face rather more strong and with comparatively longer one on margin. Procoxae contiguous; protibiae with 7 and both meso- and meta-tibiae with 12 teeth.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Cachar, Halflong and Jiri Forest; Sibsagar, Nambur



**Fig. 54 :** *Hadrodemius pseudocomans* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

range; Lakhimpur, Upper Dihing Reserve. *West Bengal* : Darjiling Dist., Dahura, Kadma and Bagdogra. ELSEWHERE : Myanmar and Thailand.

*Hosts* : *Cinnamomum cecicodaphne*, *Mallotus albus* and *Myristica longifolia*.

*Remarks* : This is one of the robust of all other scolytid species known from India. The representative specimens from West Bengal are generally much smaller than those of types from Assam. The species can easily be identified by its robust body form in addition to its concave declivital face. Beeson (1930 and 1941) recorded the species as a borer of some saplings and small poles of above mentioned hosts from Assam and West Bengal.

### Genus *Leptoxyleborus* Wood

#### 1. *Leptoxyleborus* Wood

1980. Wood, *Gt. Basin Nat.*, 40 (1) : 94.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 93.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 786 and 823.

*Types of genus* : *Leptoxyleborus* : *Phloeotrogus sordicauda* Motschulsky.

Wood (1980) proposed the genus *Leptoxyleborus* to accommodate the species, *Phloeotrogus sordicauda* Motsch. described in 1963 from Myanmar. On the basis of its characteristics, it was considered under *Xyleborus* by Hagedorn (1910). However, the genus is closely related to the genera *Theobours* Hopkins and *Coptoborus* Hopkins. But, it differs from them in having the declivity commencing slightly above to the middle of elytra, lower half of which either flat or shallowly concave and declivital surface densely covered by small and confused scales.

### 55. *Leptoxyleborus concisus* (Blandford)

(Fig. 55a-g)

#### 1. *Xyleborus concisus* Blandford

1894. Blandford, *Trans. ent. Soc. Lond.*, pp. 107-108, *Holotype* : Females in BMNH, London.  
*Type-locality* : Japan.
1910. Hagedorn, *Coleopt. Cat.*, 4 : 100.
1930. Beeson, *Indian Forest Rec.*, 14 (10) : 55.
1961. Schedl, *Philipp. J. Sci.*, 90 : 93-94, Male.
1978. Beaver and Browne, *Oriental Ins.*, 12 (4) : 606.

#### 2. *Leptoxyleborus concisus* (Blandford)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 94-96, Fig. 24, a-g.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 823.

#### 3. *Xyleborus sordicaudulus* Eggers

1927. Eggers, *Philipp. J. Sci.*, 33 : 91, Female, *Type-locality* : Palawan, Philippines.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, 25 : 49 (Synonymy).

#### 4. *Xyleborus marginatus* Eggers

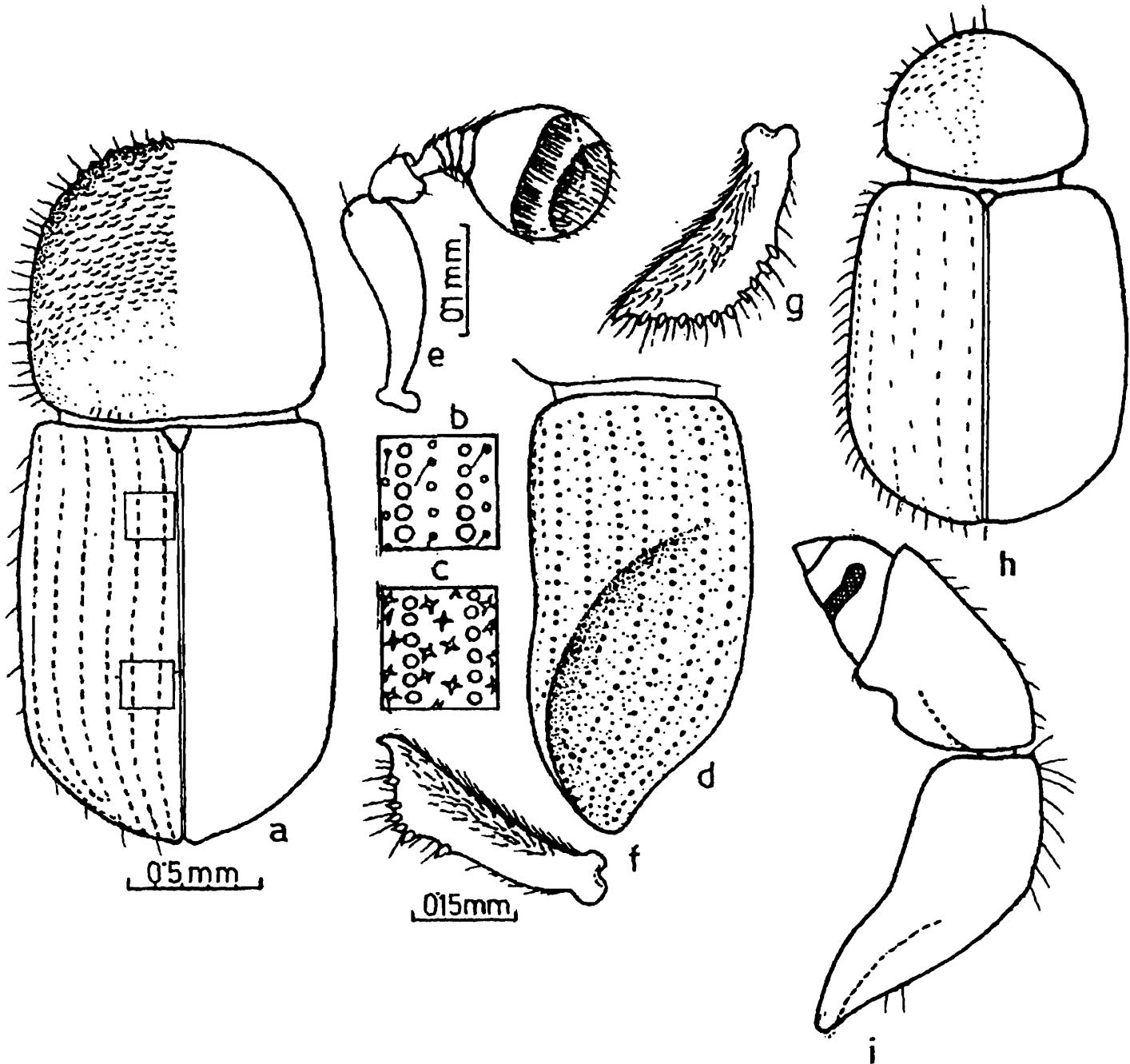
1927. Eggers, *Philipp. J. Sci.*, 33 : 91-92, Female. *Type-locality* : Mindono, Philippines.
1955. Browne, *Sarawak Mus. J.*, 36 : 354 (Synonymy).

*Description* : *Female* : Body stout and cylindrical; head and pronotum yellowish brown, elytra blackish brown; antennae and legs much paler. Body length 2.50-2.75 mm, about 2.4 times as long as wide.

Frons flatly convex, a transverse depression above the epistoma on either side of smooth and elevated median line; surface reticulate, with large close punctures of irregular size, and with sparse long hairs. Eyes elongately oval and half of its width divided by emargination. Antennal scape short and stout; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with substraight apical margin, segment 2 chitinised; posterior face with one distinct suture, other one obscure.

Pronotum subquadrate, slightly wider than long; basal margin substraight, lateral sides feebly outcurved and anterior margin broadly rounded with a few transverse small asperities; distinct summit below the middle; anterior declivous portion with transverse small asperities, still becoming smaller posteriorly and extending postero-laterally and with sparse hairs; posterior half smooth and shiny with small punctures; both lateral and posterior margins with inconspicuous hairs.

Scutellum smooth, shiny and elongately tongue-shaped.



**Fig. 55 :** *Leptoxyleborus concisus* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral disc; c, enlarged portion of elytral declivity; d, elytra in lateral view; e, antenna; f, protibia; g, mesotibia. Male : h, Pronotum and elytra in dorsal view; i, head, pronotum and elytra in lateral view.

Elytra about 1.50 times as long as and as wide as pronotum; 1.4 times as long as its width; lateral sides subparallel on basal half, hence gradually converging posteriorly with rounded apex; postero-lateral margins carinate and carina entering interstria 7; elytral disc distinctly convex, striae feebly impressed with small punctures bearing microhairs; interstriae very weakly convex with irregular punctures and small hairs. Declivity commencing from basal fifth; more than half of declivity convex and apical half weakly concave; declivital striae distinctly marked by comparatively large shallow punctures bearing microhairs; interstriae flat, irregularly punctate with squamous setae and a few erect hairs laterally. Procoxae contiguous, pro- and meso-tibiae with 6-7 and 10 teeth respectively.

*Male* : Males are more or less similar to females except in the following characters. Body stout, convex and deformed; body with comparatively long hairs than that in female; body length 1.50-1.55 mm. Pronotum uniformly convex from base to apex; shape rectangularly globose, the margins weakly outcurved with a feeble antero-median emargination; surface with minute hairs.

Elytra more or less as in female, striae and interstitial punctures shallow and irregular on basal disc; declivital surface flat with striae punctures feebly marked and interstriae irregular with minute irregular punctures and hairs; postero-lateral margins very weakly carinate.

*Distribution* : INDIA : *Andaman Islands* : North, Middle and South (Haddo, Pungibalu and Rutland Isl.) Islands. *West Bengal* : Darjiling Dist., Mongphu and Samsingh. ELSEWHERE : Myanmar, Indonesia (Borneo and Java), Malaysia, Philippines and Japan.

*Hosts* : *Mimusops litoralis*, *Albizia lebbek* and *Planchonia andamanica*.

*Remarks* : The inclusion of *Xyleborus concisus* under the genus *Leptoxyleborus* may not fully be justified due to its single suture on posterior face of antennal club (two sutures in typical *Leptoxyleborus*). However, on the basis of other characters, it shows strong affinity to the genus *Leptoxyleborus* as pointed out recently by Wood (1980) and Maiti and Saha (1986). The species is well represented in the Andaman Islands.

Originally, the species *concisus* was described from Japan by Blandford (1994) under the genus *Xyleborus*. Subsequently, three more species from the Oriental region were synonymised under it to extend its distribution limit.

## Genus *Webbia* Hopkins

### 1. *Webbia* Hopkins

1915. Hopkins, *U.S.D.A. Bur. Ent. Tech. Ser.*, **17** (11) : 222-224.

1965. Browne, *Zool. Meded.*, **40** : 204-205.

1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 79.

1972. Browne, *Oriental Ins.*, **6** (10) : 25.

1978. Wood, *Annl. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.  
 1980. Wood, *Great Basin Nat.*, **40** (1) : 96.  
 1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 103.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 829.

## 2. *Xelyborus* Schedl

1939. Schedl, *Journ. F. M. S. Mus.*, **18** : 349.  
 1961. Browne, *Malay. Forest Rec*, No. 22, p. 189.  
 1963. Browne, *Ent. Ber.*, **23** : 57 (Synonymy).

## 3. *Pseudowebbia* Browne

1961. Browne, *Malay. Forest Rec*, No. 22 p.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 829.

## 4. *Prowebbia* Browne

1960. Browne, *Philipp. J. Sci.*, **89** : 208.  
 1964. Schedl, *Reichenbachia*, **2** : 214 (Synonymy).

*Types of the genus* : *Webbia* : *Webbia dipterocarpus* Hopkins; *Xelyborus* : *Xelyborus bicornis* Schedl; *Prowebbia* : *P. subuculae* Browne.

The genus *Webbia* was established by Hopkins (1915) based on the species *Webbia dipterocarpi* Hopkins from the Philippines. Since its description, it is a well established genus in having characteristic truncated elytral apex and pronotal asperities more distinct on antero-lateral areas. As early as in 1939, Schedl designated a genus *Xelyborus* based only on the type-species, *Xelyborus bicornis* from Malaya. But Browne (1963) synonymised it under the genus *Webbia* in having antennal funicle with 3 segments. Subsequently, Browne (1960) described another genus *Prowebbia* allied to *Webbia* on the basis of variations of pronotal shape and granulate like asperities, and antennal funicle with 5 segments in some species. Later on, Schedl (1964) put this genus under *Webbia* which was further substantiated by Wood (1980). In the recent past, *Pseudowebbia*, a genus erected by Browne (1961) has been synonymised by Wood and Bright (1992) under this genus.

The genus is fairly common in the Oriental Region occurring in India, Indonesia, the Philippines, Sri Lanka and Myanmar, and is mostly associated with *Dipterocarpus* plants (Browne, 1961).

However, four species, namely, *Webbia pabo*, *W. obtusispinosus*, *W. trigintispinatus* and *W. turbinatus* occur within our limits. *W. obtusispinosus* has not been dealt here due to lack of material.

### General characters of the genus *Webbia* Hopkins

*Description : Female* : Body fairly long and cylindrical; colour brown to black, darker towards declivity. Body length 2.20-3.00 mm.

Head somewhat globose, sometimes strongly converging anteriorly; frons plano-convex with weak median line; surface rugosely reticulate, with a few scattered punctures and fine small hairs. Eyes fairly large, almost half of its width emarginate. Antennal scape short and stout; funicle with 5-segments; club obliquely truncate, basal corneous portion running upto basal one-third with weakly recurved apical margin; truncate face with two sutural lines marked by hairs; posterior face devoid of any suture.

Pronotum subrectangular or subquadrate, as long as broad or 1.4 times as long as wide; basal margin somewhat bisinuate; lateral sides subparallel; anterior margin broadly rounded, sometimes with weak median emargination; in profile, devoid of any summit; anteriorly with distinct but small asperities, sometimes granulate and with erect hairs, asperities comparatively larger antero-laterally; finely reticulate with minute indistinct punctures posteriorly but without any hair.

Scutellum submerged, not visible.

Elytra cylindrical, as wide as pronotum, 1.25-1.30 times as long as pronotum and 1.70-1.80 times as long as its own width; each elytral basal margin weakly outcurved, lateral sides subparallel upto truncate margin, discal striae indistinct, stria 3 onwards weakly curved outwardly beyond the apical third; interstria flat, surface smooth with indistinct punctures and hairs. Elytral apex truncate, declivital margin round and acute with tubercles and hairs; declivital face weakly depressed, striae impressed; striae 1, 2 and 3 distinct, interstriae weakly convex; declivity on either side of elytral suture with prominent tubercles. Procoxae contiguous.

### Key to the species of *Webbia* Hopkins based on females

1. Circumdeclivital costa of elytra with series of large and prominent spines; declivital face steep and devoid of any tubercle; sutural interstria markedly elevated at the middle and roughened with irregular granules; larger species, body length 3.00-3.10 mm ..... *W. trigintispinatus* Sampson
- Cincumdeclivital costa of elytra with series of small spines; declivital face less steep rather gradually sloping and with large tubercles below the middle, sutural interstria not markedly elevated at the middle and not so roughened with granules; smaller species, body length 2.20-2.40 mm ..... 2
2. Declivital face with a comparatively short and non-bifurcated tubercle on each elytron and placed more towards postero-laterally; declivital striae 1, 2 and 3 distinctly marked by deep punctures and recognised only upto base of tubercle; body length 2.20-2.40 mm ..... *W. turbinatus* Maiti and Saha

- Declivital face with a very large, stout and somewhat bifurcated tubercle on each elytron just below the middle; declivital stria 1 marked upto apex, other two upto base of tubercle, marked by indistinct punctures; body length 2.20-2.25 mm .....  
 ..... *W. pabo* Sampson

56. *Webbia pabo* Sampson  
 (Fig. 56)

1. *Webbia pabo* Sampson

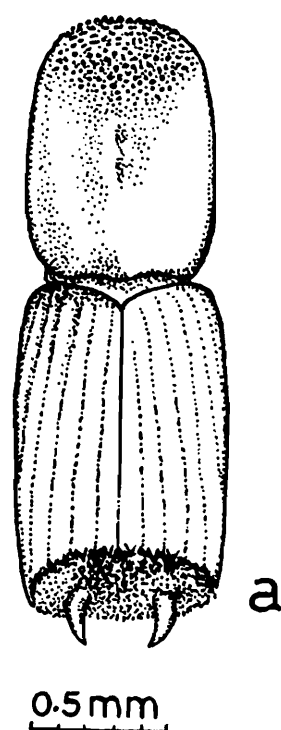
1922. Sampson, *Ann. Mag. nat. Hist.*, 10 (9) : 150, *Holotype* : Female in B.M.N.H., London.  
*Type-locality* : Kheri Lakhimpur, Uttar Pradesh, India.
1922. Beeson, *Indian Forester*, p. 500.
1972. Browne, *Oriental Ins.*, 6 (1) : 20.
1975. Beaver and Browne, *Oriental Ins.*, 9 (3) : 297.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 831-832.

*Description* : *Female* : Body fairly long and cylindrical; head chestnut brown, pronotum light brown, elytra pale yellowish, antennae and legs yellowish brown. Body length 2.20-2.25 mm, nearly 3.2 times as long as wide.

Frons plano-convex with weak median line, surface rugosely reticulate, with a few scattered punctures and fine small hairs. Eyes fairly large, with broadly rounded emargination running almost upto half of its width. Antennal scape long; funicle with 3 segments; club obliquely truncate; basal corneous portion running upto basal one-third with weakly recurved apical margin; truncate face with two sutural lines marked by hairs; posterior face devoid of any suture.

Pronotum subrectangular, 1.4 times as long as wide, basal margin somewhat bisinuate; anterior margin broadly rounded with weak median emargination; in profile, dorsal margin plano-convex without any distinct summit, but weakly declivous anteriorly; anterior one-third with distinct but small asperities and erect hairs; asperities comparatively large antero-laterally; posterior two-thirds densely and finely reticulate with very minute indistinct punctures, but without any hair.

Elytra cylindrical, 1.25 times as long as pronotum and 1.7 times as long as its width; each elytral basal margin weakly outcurved, lateral sides straight and subparallel upto truncate margin; discal striae not at all impressed but marked by minute shallow sparse punctures; stria 3 onwards weakly curved outwardly beyond the apical third; interstriae flat, much wider than striae, surface smooth with a few scattered indistinct punctures, devoid of any hair. Elytral apex truncate, declivital margin round, acute, fringed with tubercles and hairs, declivity face weakly depressed, striae impressed marked by indistinct punctures; striae marked upto apex, other two upto tubercle; interstriae flat with rows of granules and hairs, a few granules along the striae; declivity on either side of elytral suture with a very stout, large and somewhat bifurcated tubercle, much below the middle occupying interstriae 2, 3 and 4. Procoxae contiguous; protibiae with 11 and meso- and meta-tibiae with 12 teeth.



**Fig. 56** : *Webbia pabo* Sampson, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

*Distribution* : INDIA : *Uttar Pradesh* : Kheri Lakhimpur, Dehra Dun; *Madhya Pradesh*. ELSEWHERE : Malaysia (Sarawak), Thailand, Tibet (Xizang) and China (Yunnan).

*Host* : *Shorea robusta*.

*Remarks* : The species is very close to *W. turbinatus* in major characters.

### 57. *Webbia trigtispinatus* Sampson

#### 1. *Webbia 30-spinatus* Sampson

1922. Sampson, *Ann. Mag. nat. Hist.*, **10** (9) : 149, *Holotype* : Female in B.M. Nat. Hist., London. *Type-locality* : Kaing Range, Pyimana, Myanmar.

#### 2. *Webbia trigtispinatus* Sampson

1975. Beaver and Browne, *Oriental Ins.*, **9** (3) : 297.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ., Paper No. 86* : 103-104.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 833.

#### 3. *Webbia 26-spinatus* Sampson

1922. Sampson, *Ann. Mag. nat. Hist.*, **10** (9) : 149, *Holotype* : Female in B.M. Nat. Hist., London. *Type-locality* : Kaing Range, Pyimana, Myanmar.

1963. Browne, *Ent. Ber.*, **23** : 57 (Synonymy).

*Description : Female :* Body fairly long and cylindrical; head chestnut brown, pronotum and elytra light brown; antennae and legs pale yellow. Body length 3.00-3.10 mm, nearly 3 times as long as wide.

Frons plano-convex, roughened with distinct scattered punctures and fine hairs. Eyes fairly large, suboval with shallow emargination. Antennae as in *W. pabo*.

Pronotum subrectangular, 1.14 times as long as wide, basal margin substraight; lateral margins subparallel, converging anteriorly from anterior one-third, anterior margin with weak median emargination; in profile, anterior one-third declivous, surface roughened with weak distinct but small asperities and scattered fine hairs; anterior margin with comparatively larger asperities; summit indistinct on posterior two-thirds, surface smooth and shiny with minute regular punctures.

Elytra subcylindrical, about 1.20 times as long as pronotum and 1.50 times as long as wide; each elytral basal margin weakly out curved, lateral margin subparallel upto truncate margin; discal striae not well marked but marked by fine row of punctures; interstriae coarse, much wide with fine punctures and hairs; each interstria with fairly large tubercle at the terminal end on the margin of declivity; each elytra with 13 tubercles, interstria 4 onwards diverging towards lateral margins. Elytral apex truncate, declivital margin round, acute and fringed with tubercles, declivital face plano-concave with bulging out granulate surface at the middle along the sutural line; striae marked by indistinct puncture and interstriae 1-4 distinct and marked by row of distinct granules. Procoxae contiguous, protibiae with 11 and meso- and meta-tibiae with 13 teeth.

*Male :* Unknown.

*Distribution :* INDIA : *Andaman Islands* and *Assam* : Lakhimpur. ELSEWHERE : Myanmar, Cambodia, Malaysia, South Vietnam, Thailand and Cochin-China.

*Hosts :* *Dipterocarpus pilosus*, *D. tuberculatus*, *D. turbinatus*, *Hopes odorata* and *Mallotus albus*.

*Remarks :* The species can easily be recognised by the presence of 26-30 spines on the circumdeclivital margin. Biology of the species is known only as pin-hole borer in *Dipterocarpus* plants of the south-east Asian countries (Beeson, 1922 and 1941).

## 58. *Webbia turbinatus* Maiti and Saha (Fig. 57)

### 1. *Webbia turbinatus* Maiti and Saha

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 104-107, *Holotype* : Female deposited in F.R.I., Dehra Dun and Z.S.I., Calcutta. *Type-localities* : Stewart Sound and Chidyatapu, North Andamans, India.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 833.

*Description : Female :* Body fairly long and cylindrical; head chestnut brown,

pronotum light brown, elytra yellowish white with brownish tinge on declivital margin; antennae and legs yellowish brown. Body length 2.30-2.40 mm, nearly 3.2 times as long as wide.

Since the other characters are similar to *W. pabo*, those are not included here to avoid repetition. However, differentiating characters are indicated in the key.

*Male* : Similar to the female except the following characters : Asperities on the antero-lateral sides smaller; elytral declivity somewhat obliquely truncate with marginal tubercles reduced into granules; tubercles on the posterior half on declivital face comparatively smaller.

*Distribution* : INDIA : *Andaman Islands* : North Andaman (Stewart sound), Middle Andaman, and South Andaman (Chidyatapu). ELSEWHERE : None.

*Hosts* : *Dipterocarpus turbinatus* and *Sapium eugenifolium*.

*Remarks* : The species is so far known only from its type-locality in North Andaman. The short and non-bifurcated tubercles keeps the species separate from two other Indian species. Nothing is known about its biology, except the record of two hosts as mentioned above.

### Genus *Xyleborinus* Reitter

#### 1. *Xyleborinus* Reitter

1913. Reitter, *Wien. ent. Ztg.*, **32** (2) : 83.

1957. Schedl, *Ann. Mus. Roy. Congo. Belge, Tervuren Ser.*, **8**, *Sci. Zool.*, **56** : ?

1961. Wood, *Coleopt. Bull.*, **15** : 47.

1980. Wood, *Great Basin Nat.*, **40** (1) : 96.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No.* 86 : 107.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 803.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6* (B) : 828.

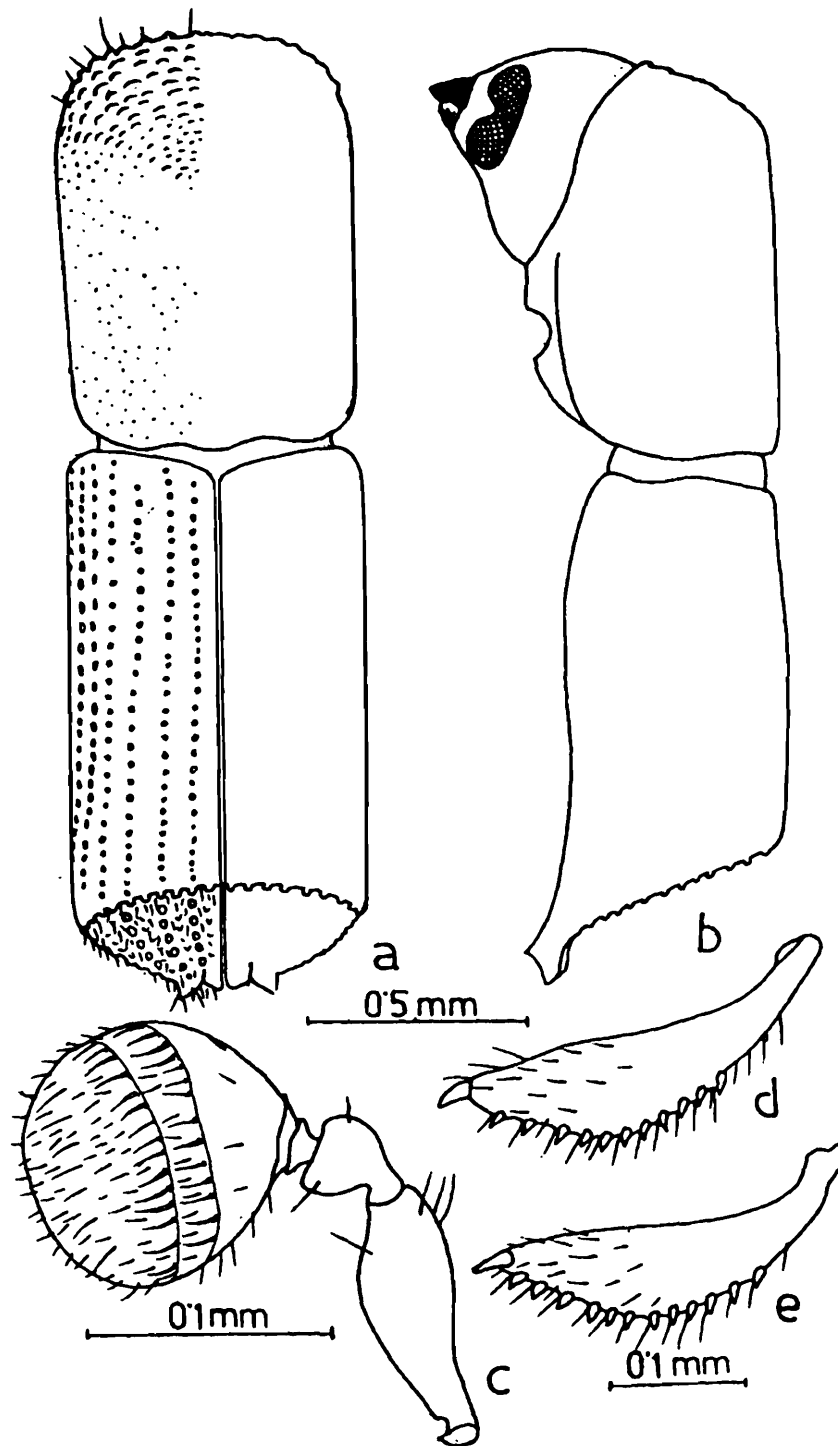
*Type of the genus* : *Bostrichus saxeseni* Ratzeburg.

The genus remained as a valid one, until Schedl (1957) synonymised it under the genus *Xyleborus*. Recently, Wood (1980) revived its generic status. However, the genus, as we conceive today, is based on the characteristic tubercle-like scutellum that does not fit into the sutural notch, encircled with tuft of close bent hairs and elytra either with granules or tubercles at their postero-lateral margins.

#### General characters of the genus *Xyleborinus* Reitter.

*Female* : Body short and cylindrical, sometimes with tapering elytral apex; reddish brown to complete black in colour. Body length 1.60-2.75 mm; 2.60-3.10 times as long as wide.

Head globose, frons plano-convex, surface reticulate with large close or scattered punctures and long hairs; median line either indistinct or inconspicuous. Eyes generally elongately oval, angularly emarginate almost upto half of its width. Antennal scape short; funicle with 5 segments; club oval and obliquely truncate; on anterior face, basal corneous area reaching upto apical third with costate margin forming a complete ring; truncate face with one more suture; posterior face unmarked by any suture.



**Fig. 57 :** *Webba turbinatus* Maiti and Saha, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna; d, protibia; e, mesotibia.

Pronotum nearly as long as wide or sometimes longer (1.20 times); basal margin generally substraight; lateral sides subparallel upto two-thirds; anterior margin broadly to narrowly rounded and unarmed; summit generally slightly above the middle, either distinct or sometimes inconspicuous; anterior one-third or almost half with weak but distinct asperities and erect hairs; posterior half comparatively smooth with scattered fine punctures and either with small or long hairs.

Scutellum reduced and conical, not filling up the entire scutellar space, mostly occupied by tuft of bent hairs.

Elytra 1.40-1.70 times as long as pronotum and 1.5-2.0 times as long as its own width; basal margin with broad scutellar emargination, otherwise substraight; lateral sides subparallel upto basal half or two-thirds, thence weakly to strongly converging posteriorly terminating into narrowly (*X. andrewesi*) to broadly rounded apex, sometimes with weak emargination; discal striae with uniseriate row of either shallow, small or large punctures, each with a microhair, microhair sometimes inconspicuous; interstriae either flat or weakly convex, with either punctures or granules, generally granulate towards declivity and either with short or long hairs. Declivity weakly marked commencing from the middle to posterior third; declivital surface generally opaque; shape, size and placement of granules and tubercles on the declivital interstriae variable; declivital face weakly convex, mostly depressed along the interstriae and striae 1 and 2; all the declivital interstriae with granules or tubercles (e.g. *X. andrewesi*) and in rest of Indian species, interstriae 2 or both 1 and 2 devoid of any granule or tubercle, except a few at the commencement of declivity.

#### Key to the species of *Xyleborinus* Reitter based on females

1. All declivital interstriae 1-7 armed with either granules or tubercles throughout (Fig. 58,b); elytra strongly converging posteriorly from middle to narrowly rounded apex; body length 1.80-1.85 mm ..... *X. andrewesi* (Blandford)
- All declivital interstriae 1-7 armed either with granules or tubercles, except on 2 or on both 1 and 2; if at all present, a few granules only present at the summit of declivity; elytra not strongly but gradually converging posteriorly to broadly rounded apex ..... 2
2. Declivital face depressed along striae and interstriae 1 and 2; interstria 3 bearing 5-6 distinct tubercles (2-3 granules in *Holotype* of *X. subspinosus*) in row forming a margin along depressed area ..... 3
- Declivital face along striae and interstriae 1 and 2 not depressed, rather both interstriae 1 and 3 feebly elevated with distinct granules or tubercles ..... 4
3. Both interstriae 1 and 2 devoid of any granule or tubercle, except a few at commencement of declivity; body length 2.30-2.75 mm ..... *X. subspinosus* (Eggers)

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\**Xyleborinus speciosus* (Schedl) has not been included in the key, due to non-availability of material deposited in Nat. Hist. Mus., Wien.

- Only interstria 2 devoid of any granule or tubercle, except a few at the commencement of declivity; body length 2.00 mm ..... *X. spinipennis* (Eggers)
- 4. Elytra 1.7 times as long as pronotum; striae 1 and 2 very close at the declivital face (Fig. 61, b); body length 2.40-2.60 mm ..... *X. saxeseni* (Ratzeburg)
- Elytra 1.4-1.5 times as long as pronotum; striae 1 and 2 not so close at the declivital face ..... 5
- 5. Larger species, body length 2.30-2.35 mm; declivity commencing on posterior fourth and face somewhat abruptly sloping (Fig. 59,c) ..... *X. artestriatus* (Eichhoff)
- Smaller species, body length 1.60-1.80 mm; declivity commencing from middle to posterior third (Fig. 60,b) and declivital face rather gradually sloping ..... 6
- 6. Body 2.6 times as long as wide; each elytral apex with 3 large pointed tubercles; declivital face shiny, interstriae with distinct granules throughout, striae punctures shallow, each with a microhair; body length 1.80 mm ..... *X. exiguus* (Walker)
- Body nearly twice as long as wide; each elytral apex with 1-2 distinct granules; declivital face opaque, interstria 1 with a few granules only upto middle of declivity, striae punctures and microhairs inconspicuous; body-length, 1.60-2.00 mm .....  
..... *X. subgranulatus* (Eggers)

### 59. *Xyleborinus andrewesi* (Blandford)

(Fig. 58)

#### 1. *Xyleborus andrewesi* Blandford

1895. Blandford, *Trans. ent. Soc. Lond.*, p. 227. *Types* : Female in B.M. Nat. Hist., London.  
*Type-locality* : Belgaum, Karnataka, India.
1975. Schedl, *Revue suisse Zool.*, **82** (3) : 450.
1975. Beaver and Browne, *Oriental Ins.*, **9** (3) : 297.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 603.

#### 2. *Xyleborinus andrewesi* (Blandford)

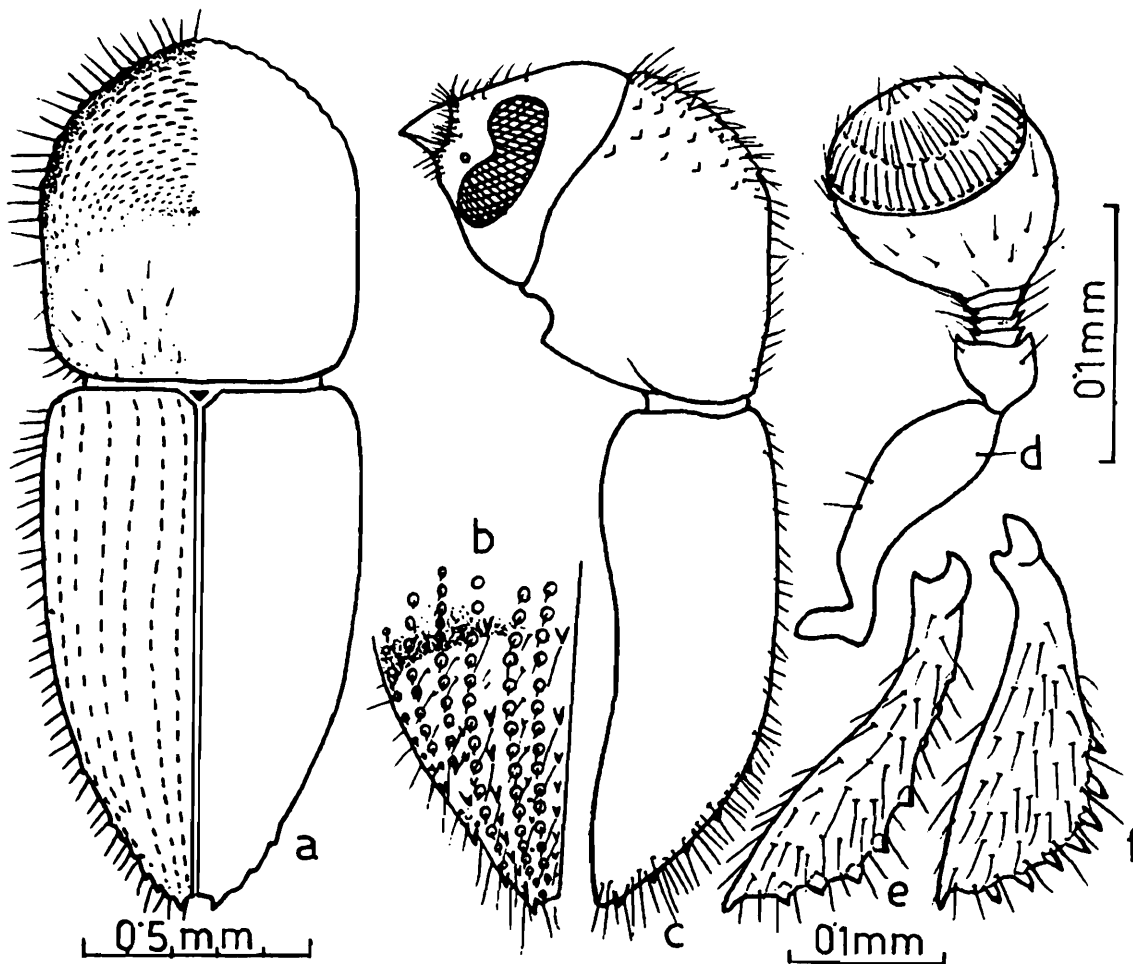
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 107-109, Fig. 27, a-b.
1985. Beaver and Loytyniemi, *Revue Zool. afr.*, **99** : 72-73.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 804-805.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 828, 829.

#### 2. *Xyleborus persphenos* Schedl

1870. Scheld. *Proc. Linn. Soc. N.S.W.*, **94** : 219. Female. *Type-locality* : Simbai, Madang Dist., New Guinea.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 603 (Synonymy).

*Description : Female* : Body short and elongate with tapering elytral apex; head, pronotum and elytra blackish brown, antennae and legs rather paler. Body length 1.80-1.85 mm, nearly thrice as long as wide.

Frons plano-convex, surface reticulate with large scattered punctures and long hairs; median line inconspicuous. Eyes elongately oval, angularly emarginate almost upto half of its width. Antennal scape short; funicle with 5 segments; club oval and obliquely truncate; on anterior face, basal corneous area reaching upto apical third with costate margin forming a complete ring; truncate face with one more suture; posterior face unmarked by any suture.



**Fig. 58** : *Xyleborinus andrewesi* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, enlarged view of declivity of single elytron; c, head, pronotum and elytra in lateral view; d, antenna; e, protibia; f, mesotibia.

Pronotum 1.20 times as long as wide; lateral sides weakly outcurved and anterior margin broadly rounded and unarmed; summit distinct, slightly above the middle; declivous portion with weak but distinct asperities and erect hairs; posterior half comparatively smooth with scattered fine punctures and small hairs.

Scutellum reduced and conical, not filling up the entire scutellar space, mostly occupied by tuft of bent hairs.

Elytra 1.40 times as long as pronotum and 1.68 times as long as its width; lateral sides subparallel upto basal half, whence apex strongly converging posteriorly terminating into narrowly rounded end with weak emargination; discal striae with uniseriate row of shallow large punctures, each with a microhair; interstriae weakly convex with weak granules and long hairs. Declivity commencing slightly below the middle, face convex and opaque; strial punctures indistinct at declivital face, each with a microhair; interstria 1 weakly convex with 5-6 pointed tubercles, 2 flat and with a few small granules, 3 and 4 weakly convex and with uniseriate distinct pointed tubercles becoming more prominent towards apex, 5, 6 and 7 with few granules; striae 1, 2 and 3 complete, and 4 and 5 forming a loop.

*Male* : Unknown.

*Distribution* : INDIA : *Andaman Islands* : North, Middle and South Andamans; *Assam*; *Kerala* : Parambikulam and Cardamon Hills (1000 m); *Bihar* : Singhbhum; *Madhya Pradesh* : Balaghat, Reigarh Range; Bilaspur, Amanala; Raipur, North Sihawa Range; *Karnataka* : Belgaum : North and South Kanara; *Tamil Nadu* : Anaimalai Hills; Nilgiris, Coonoor River Valley; North Coimbatore hills; *Orissa* : Jajpur-Keonjhar. *Uttar Pradesh* : Dehra Dun; Gorakhpur. *West Bengal* : Darjiling Dist., Sukna; Jalpaiguri Dist., Apalchand Range, Buxa, Gazalduba, Jalpaiguri, Lower Tondu and Sarda. ELSEWHERE : Nepal, Malaysia, Indonesia (Java, Borneo and Timor), Thailand, Philippines, Bangladesh, Sri Lanka, Micronesia, New Guinea, New Zealand, Seychelles and East Africa.

*Hosts* : *Albizzia lebbek*, *A. stipulata*, *Anacardium occidentale*, *Bombax malabaricum*, *Buchanania latifolia*, *Canarium euphyllum*, *Cryptocarya wightiana*, *Dillenia pentagyna*, *Dipterocarpur turbinatus*, *Eugenia jambolana*, *Garuna pinnata*, *Lannea coromandalica*, *L. grandis*, *Mangifera indica*, *Mesua ferrea*, *Myristica andamanica*, *Pakia speciosa*, *Poinciana elata*, *Shorea robusta*, *S. talura*, *Sterculia alata*, *Tectona grandis*, *Terminalia bialata* and *T. procera*.

*Remarks* : The strongly acuminate elytral apex serves as the distinctive character of the species and distinguishes it from all other representatives of the genus in India. The species is a common pinehole borer infesting a number of host-plants in the old world tropics. The species although is known to attack agricultural plants like cocco, quinine, tea, etc., is never recognised as a primary pest. Recently, Maiti and Saha (1986) reported it from the felled logs of three hosts-plants. Biology of the species is fairly well studied in India (Beeson, 1930 and 1941), Malaya (Browne, 1961), Indonesia (Kalshoven, 1959) and Africa (Schedl, 1962).

## 60. *Xyleborinus artestriatus* (Eichhoff)

(Fig. 59)

### 1. *Xyleborus artestriatus* Eichhoff

- 1878/79. Eichhoff, *Mem. Soc. Roy. Sci. Liege*, **8** (2) : 507, *Holotype* : Female in Hamburg Museum, *Lost. Type-locality* : India.
1959. Schedl, *Trans. R. ent. Soc. Lond.*, **111** : 506.
1969. Schedl, *Oriental Ins.*, **3** (1) : 52.

## 2. *Xyleborinus artestriatus* (Eichhoff)

1984. Saha and Maiti, *Rec. zool. Surv. India*, **81** (3 & 4) : 4.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 805.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 828, 829

## 3. *Xyleborus laticollis* Blandford

1896. Blandford, *Trans. ent. Soc. Lond.*, p. 226; *Female. Type-locality* : Karnataka, India.  
*Holotype* : Female in B.M.N.H., London.

1930. Beeson, *Indian Forest Rec., (Ent.)*, **14** (10) : 68.

1958. Schedl, *Tijdschr. Ent.*, **83** (3-4) : 152 (Synonymy).

*Description* : *Female* : Body short and cylindrical; head, pronotum and elytra yellowish brown, antennae and legs rather paler. Body length 2.30-2.35 mm and 2.6 times as long as wide.

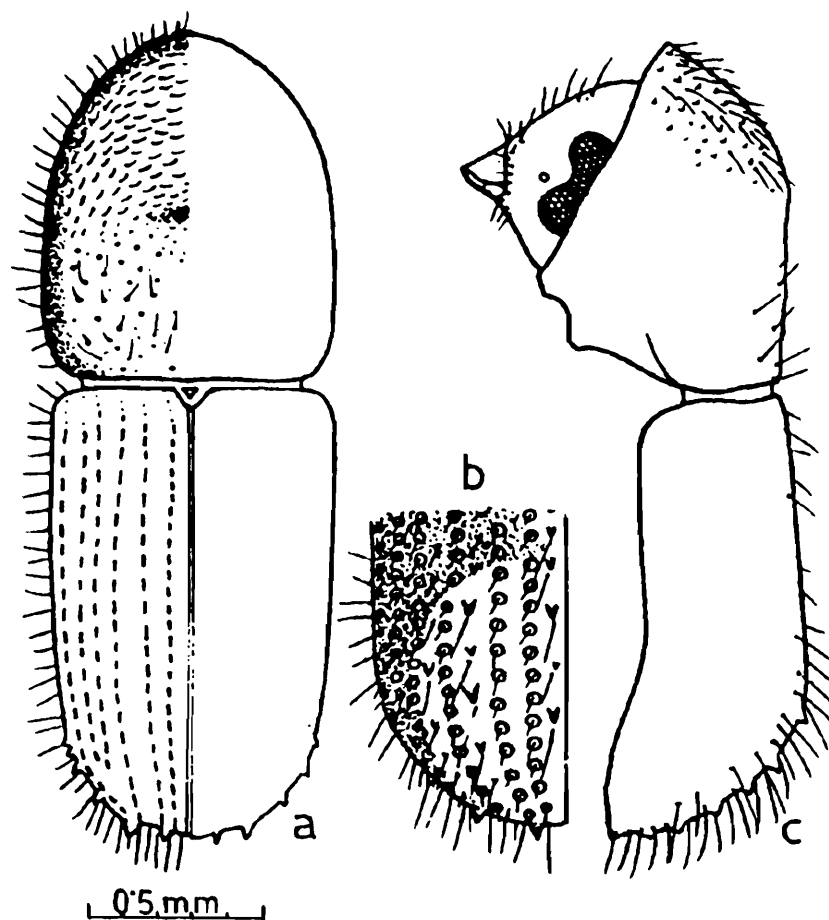
Frons plano-convex, with an indistinct median line, surface finely reticulate with large close irregular punctures and sparse erect hairs. Eyes emarginate upto half of its width. Antennal scape short, funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming almost a complete ring; truncated face with suture 1 distinct; posterior face unmarked by any suture.

Pronotum 1.08 times as long as wide, lateral sides subparallel upto two-thirds, anterior margin broadly rounded and unarmed; indistinct summit just above the middle; more than anterior one-third with weak asperities, posteriorly shiny with minute punctures; vestiture of long fine hairs.

Scutellum reduced and conical, not filling up the scutellar space, occupied by tuft of bent hairs.

Elytra 1.4 times as long as pronotum and 1.5 times as long as its width; sides subparallel nearly upto two-thirds, thence weakly converging posteriorly, with broadly rounded apex; discal striae feebly but gradually impressed towards declivity, striae puncture close and distinct, and each with a microhair; interstriae flat, wider than striae, with a few minute puncture towards basal half and rest gradually feebly convex with distinct granules, each with a long erect hair. Declivity subvertical and commencing from posterior one-third; face rather flat; interstriae 1-7 with a number of scattered tubercles except interstria 2, where only a few at the commencement of declivity; declivital apex with 2 large tubercles on interstriae 2 to 4; tubercles those at commencement and at interstriae 4, 5 and 6 rather comparatively smaller; striae punctures with microhairs and interstitial tubercles each with one erect long hair.

*Male* : Unknown.



**Fig. 59** : *Xyleborinus artestriatus* (Eichhoff), Female : a, Pronotum and elytra in dorsal view; b, enlarged view of declivity; c, head, pronotum and elytra in lateral view.

*Distribution* : INDIA : *Madhya Pradesh* : Raigarh Range, Balaghat; Birguri, Raipur. *Sikkim* : Mantham. *Uttar Pradesh* : Dehra Dun; Gohari Range, Lansdowne. *West Bengal* : Jalpaiguri Dist., : Kariarbanda; and South 24 Parganas : Sundarbans. ELSEWHERE : Bangladesh, China, Indonesia, Laos, Myanmar, Malaysia, Nias, Sri Lanka, Vietnam, Australia (Queensland), Bismark Island, Fiji Island and New Ginea.

*Hosts* : *Eugenia jambolana*, *Heritiera fomes*, *Lannea grandis*, *Mallotus philippinensis*, *Phyllanthus emblica*, *Semecarpus anacardium* and *Shorea robusta*.

*Remarks* : The species has been transferred to the genus *Xyleborinus* (Wood and Bright, 1992a). On the basis of variation in sculpture and proportionately elongate pronotum, *X. laticollis* hardly differs from *X. artestriatus*, which was reasonably been synonymised under the later species by Schedl (1958).

The species is reported to attack timbers exposed in sun avoiding those in the shade and completes its development within 12 months (Beeson, 1930). It is known to infest a number of host-plants (Beeson, 1930 and 1941) in India as well as in Malaysia (Browne, 1961).

61. *Xyleborinus exiguus* (Walker)  
(Fig. 60)

1. *Bostrichus exiguus* Walker

1859. Walker, *Ann. Mag. nat. Hist.*, **3** (3) : 260, *Holotype* : Female in B. M. Nat. Hist., London.  
*Type-locality* : Sri Lanka.

2. *Xyleborus exiguus* (Walker)

1896. Blandford, *Trans. ent. Soc. Lond.*, p. 228.  
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 104.  
1935. Beeson, *Pacific Ent. Surv. Pub.*, **8** (7) : 118.  
1960. Wood, *Insects of Micronesia*, **18** (1) : 60.  
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 55.  
1971. Schedl, *Steenstrupia*, **1** : 148.  
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 608.

3. *Xyleborinus exiguus* (Walker)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 109-112, Fig. 28, a-b.  
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 806-807.

4. *Xyleborus muriceus* Eichhoff

1878. Eichhoff, *Mem. Soc. Roy. Sci. Liege*, **8** (2) : 506, Female, *Type-locality* : India (Syntype).  
1896. Blandford, *Trans. ent. Soc. Lond.*, p. 228 (Synonymy).

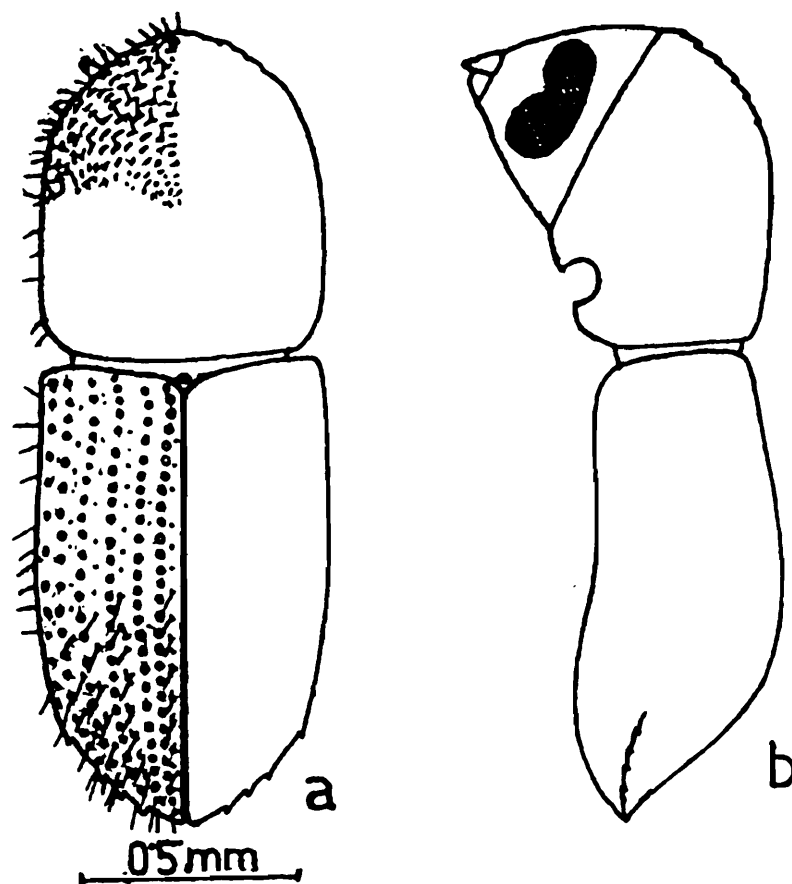
5. *Xyleborus perexiguus* Eggers (in lit.)

1958. Schedl, *Tijdschr. Ent.*, **101** (3-4) : 155 (Synonymy).

*Description* : *Female* : Body short and cylindrical; head, pronotum and elytra reddish brown; antennae and legs paler than body. Body length 1.75-1.80 mm, 2.6 times as long as wide.

Frons moderately convex, surface reticulate with large close punctures, each with a hair; median line distinct; epistomal margin with fringe of distinct hairs. Eyes elongately oval, angularly emarginate nearly half of its width. Antennal scape short; funicle with 5 segments; antennal club oval and obliquely truncate, segment 1 much enlarged and corneous; on anterior face, basal corneous area reaching upto apical third and with a costate margin forming a complete ring; truncate face with one more suture; posterior face devoid of any suture.

Pronotum cylindrical, 1.10 times as long as wide; basal margin substraight; lateral sides subparallel upto basal two-thirds, thence broadly rounded anteriorly; anterior



**Fig. 60** : *Xyleborinus exiguus* (Walker), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

half declivous with weak asperities gradually disappearing towards summit and with long erect hairs; posterior half finely reticulate with distinct punctures and with a few scattered hairs.

Scutellum reduced and conical, not filling up the scutellar space mostly occupied by tuft of hairs.

Elytra 1.47 times as long as and as wide as pronotum; basal margin substraight; lateral sides subparallel upto middle, thence narrowing posteriorly and terminating into a narrowly rounded apex; postero-lateral margins without any carina; nearly half of elytral surface smooth with uniseriate row of large, shallow strial punctures, each with a microhair; interstriae with inconspicuous granules and erect small hairs. Declivity commencing almost at the middle, gradually sloping posteriorly with convex face; stria 1 impressed and more closely placed to stria 2; strial punctures shallow, each with a microhair; all the declivital interstriae with sparse uniseriate tubercles of variable size except on interstria 2 where only a few at declivital base; each tubercle with comparatively long hair; apex with 3 large pointed tubercles from the interstriae 2-4.

*Distribution* : INDIA : *Andaman Islands* : South Andaman (Blandford, 1896), ELSEWHERE : Nepal, Sri Lanka, Burma, Malaysia, Indonesia (Java, Sumatra and

Buru Isl.). Philippines, Vietnam, Thailand, New Guinea, Goodenough Isl., New Britain, Solomon Isl., Fiji Isl., Tahiti Isl. and Australia.

*Host* : *Artocarpus chaplasha* and *Canarium euphyllum*.

*Remarks* : *Xyleborinus exiguus* (Walker) is a very distinct species in possessing three teeth on the postero-lateral margins of the declivity at apices of interstriae 2- 4. The distribution of the species in India restricts to the Bay Islands only. It is also known to be associated with many host-plants in Malaya (Browne, 1961). In spite of its close association with many economic plants including agricultural crops, destructive propensity of the species as hardly been recognised.

62. *Xyleborinus saxeseni* (Ratzeburg)  
(Fig. 61)

1. *Bostrichus saxeseni* Ratzeburg

1837. Ratzeburg, *Die Forest-insekten*, 1 : 167 (Syntypes, Female : Presumably lost with Hamburg Mus.).

2. *Xyleborinus saxeseni* (Ratzeburg)

1913. Reitter, *Wiener Ent. Zeit.*, 32 (2) : 83.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 828, 829-830, fig. 18, a-d.

3. *Tomicus dohrni* Wollaston

1854. Wollaston, *Ins. Mader.*, p. 290, Female. *Type-locality* : Madera.

4. *Tomicus decolor* Boieldieu

1859. Boieldieu, *Annls. Soc. ent. Fr.*, 7 (3) : 473, Male. *Type-locality* : Environs of Peron.

5. *Bostrichus aesculi* Ferrari

1867. Ferrari, *Die Forst und baumzuchtschadlichen Borkenkafer*, p. 22, Female. *Type-locality* : Wien, Austria.

1962. Schedl, *Rev. Ent. Moc.*, 5 (1) : 498 (Synonymy).

6. *Xyleborus subdepressus* Rey

1883. Rey, *Rev. d. Ent.*, 2 : 142, Female. *Type-locality* : Environ de Lyon.

1962. Schedl, *Rev. Ent. Moc.*, 5 (1) : 498 (Synonymy).

7. *Xyleborus quercus* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, 99 : 63, Female. *Type-locality* : Mississippi, U.S.A.

1962. Wood, *Gt. Basin Nat.*, 22 (1-3) : 79 (Synonymy).

8. *Xyleborus pecanis* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, 99 : 63. *Type-locality* : Mississippi, U.S.A.

1962. Wood, *Gt. Basin Nat.*, **22** (1-3) : 79 (Synonymy).

#### 9. *Xyleborus floridensis* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 63, Female. *Type-locality* : Florida, U.S.A.

1962. Wood, *Gt. Basin Nat.*, **22** (1-3) : 79 (Synonymy).

#### 10. *Xyleborus arbuti* Hopkins

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 64, Female. *Type-locality* : California, U.S.A.

1962. Wood, *Can. Ent.*, **89** (9) : 403 (Synonymy).

#### 11. *Xyleborus canedensis* Swaine

1917. Swaine, *Dom. Canada, Dept. Agric. Ent. Br. Teck. Bull.*, **14** : 24, Female, *Type-locality* : Isle.

1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 498 (Synonymy).

#### 12. *Xyleborus subspinosus* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)* **14** (9) : 203, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Shillong, Meghalaya, India.

#### 13. *Xyleborus tsugae* Swaine

1934. Swaine, *Can. Ent.*, **66** : 204, Female. *Type-locality* : British Columbia.

1957. Wood, *Can. Ent.*, **89** (9) : 403 (Synonymy).

#### 14. *Xyleborinus librocedri* Swaine

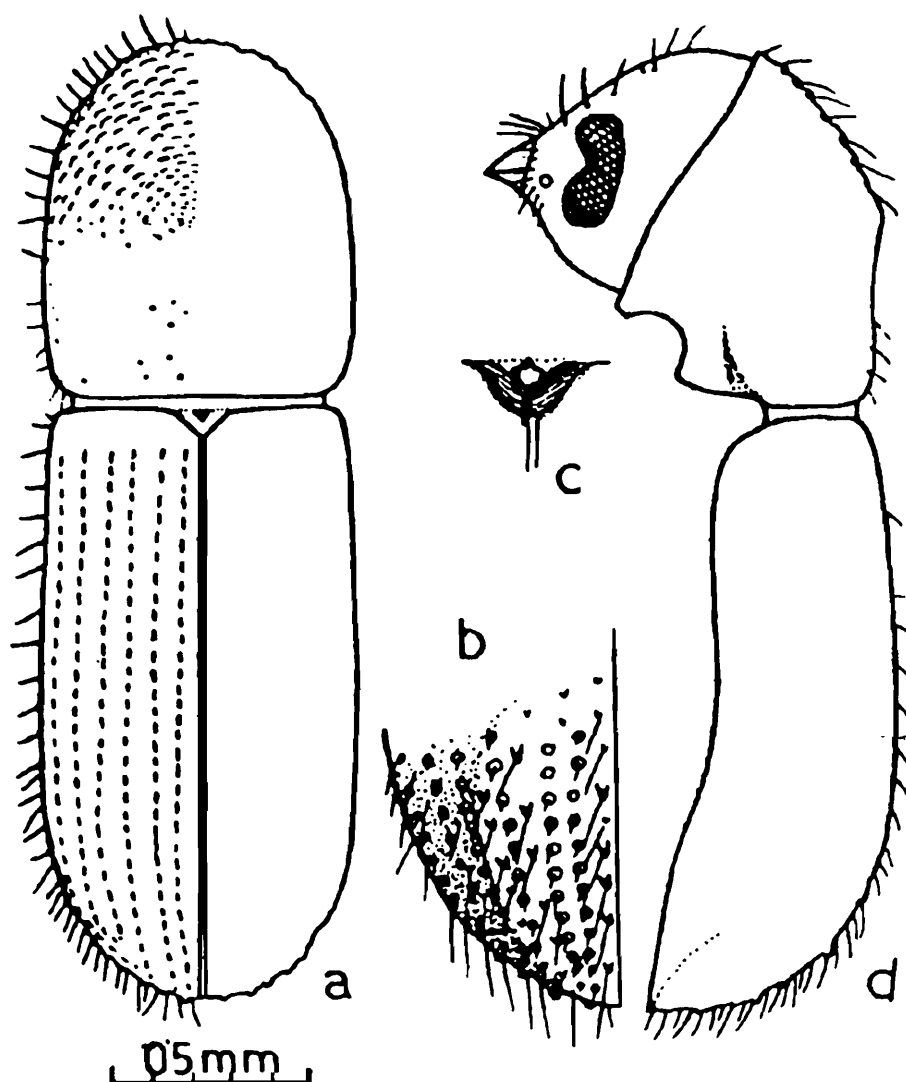
1934. Swaine, *Can. Ent.*, **66** : 205, Female, *Type-locality* : Oregon.

1957. Wood, *Can. Ent.*, **89** (9) : 403 (Synonymy).

*Description* : *Female* : Body long and cylindrical; head and pronotum reddish brown, elytra comparatively darker, antennae and legs paler. Body length 2.40-2.60 mm, 3.1 times as long as wide.

Frons flatly convex with median line rather indistinct; surface finely reticulate, with large irregular close punctures gradually obsolete towards epistomal margin and erect hairs. Eyes elongately oval, almost half of its width emarginate. Antennal scape short; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved costate, apical margin almost forming a complete ring; truncate face with suture 1 distinct; posterior face devoid of any suture.

Pronotum nearly 1.2 times as long as wide; basal margin almost straight; lateral sides subparallel upto two-thirds, anterior margin broadly rounded and unarmed; summit nearly on anterior one-third; anterior one-third with weak asperities, a few extending laterally; nearly posterior two-thirds shiny, finely reticulate with sparse minute punctures; vestiture of fine hairs, more dense on anterior one-third.



**Fig. 61** : *Xyleborinus saxeseni* (Ratzeburg), Female : a, Pronotum and elytra in dorsal view; b, enlarged view of declivity of single elytron; c, enlarged portion of scutellar area; d, head, pronotum and elytra in lateral view.

Scutellum reduced and conical, not filling up the scutellar space occupied by tuft of bent hairs.

Elytra 1.7 times as long as pronotum and nearly twice as long as its own width; lateral sides subparallel upto two-thirds, thence gradually converging to broadly rounded apex; discal striae somewhat feebly impressed marked by distinct punctures, microhair not distinct; interstriae wider than striae with a few sparse punctures towards base and laterally, but rest with uniseriate granules and with erect hairs. Declivity commencing on posterior third, face plano-convex; striae 1 and 2 very close at the declivital face, strial puncture each with a microhair; interstriae 1, 3 and 4 feebly elevated with small tubercles and rest of the interstriae with granules except interstria 2; each granule or tubercle with a erect hair.

*Male* : Body cylindrical, yellowish brown in colour. Body length 2.20 mm.

Head almost concealed from above, frons plano-convex, surface finely reticulate with large distinct irregular punctures and with few hairs. Eyes weakly emarginate. Anterior margin of corneous portion of club distinctly recurved.

Pronotum almost as long as broad, basal margin substraight with obtuse posterolateral angles; apex broadly rounded and anterior one-third with granules-like weak asperities and posterior surface with small sparse punctures with mixed short and long hairs.

Scutellum tubercle-like, scutellar space with close hairs.

Elytra 1.6 times as long as pronotum and 1.8 times as long as its width; basal margin substraight; sides subparallel upto posterior three-fourths, converging posteriorly with narrowly rounded apex; discal striae with uniseriate row of indistinct and shallow punctures, interstriae slightly wider than striae, smooth, rather flat with uniseriate row of long hairs. Declivity steep, commencing slightly beyond the posterior one-fourth of elytra; striae and interstriae 1 and 2 comparatively much depressed with small hairs, both striae and interstriae 3 onwards weakly convex with long erect hairs, interstria 3 forming an excavital margin bearing 4 - 5 distinct tubercles almost in row, interstria 4 with three smaller tubercles, each sutural interstria with one smaller granule as commencement of declivity. Procoxae contiguous, protibiae with 7 and meso- and meta-tibiae with 9 socketed teeth.

*Distribution* : INDIA : Assam. Kashmir : Lolab Valley (2000 m); Pahlgam (alt. 2333 m), Liddar Valley; Srinagar (alt. 1833 m). Uttar Pradesh : Lambatach (alt. 3,533 m), Chakrata; Mussoorie; Dhaulti Ganga Valley (alt. 3,533 m); Kumaon, West Almora. West Bengal : Darjiling Dist. : Debrepani, Lopchu, Lapchajagat (alt. 1846 m), Rambhi, Rangirum (alt. 1846 m), Samsingh. ELSEWHERE : Asia, Europe, North and South America, Australia, Africa and Japan. (Wood and Bright, 1992a, details distribution).

*Hosts* : *Fraxinus excelsior hookari*, *Jaglans regia*, *Prunus padus*, *Symplocos theaeifolia*

*Remarks* : It is one of the oldest species known from India and is described initially as *Bostrichus saxeseni* Ratzeburg and subsequently has been transferred to *Xyleborus*. However, Eichhoff and Schwars (1896) synonymised it under *Xyleborus xylographus* Say which is followed by Hagedorn (1910). This is a widely distributed and variable species.

Beeson (1930) reported it for the first time from the western Himalaya and Saha and Maiti (1996) from the Eastern Himalaya indicating its occurrence in the high altitudes of the Himalaya. Biological information is furnished by Schedl (1962).

### 63. *Xyleborinus speciosus* (Schedl)

#### 1. *Xyleborus speciosus* Schedl

1875. Schedl, *Rev. suisse. Zool.*, **82** (3) : 457, *Holotype* : Female in Nat. Hist. Mus., Wien. *Type-locality* : Darjiling, West Bengal, India.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B) : 775 and 866.*

## 2. *Xyleborinus speciosus* (Schedl)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 817.

*Description : Female* : Body length 2.50 mm, 2.5-2.9 times as long as wide. Frons broadly convex, subshining with minute punctures, surface glabrous except for a fringe of pale downwards erected hairs on the epistomal margin.

Pronotum little longer than wide, postero-lateral angles rectangular and little rounded, sides parallel on basal half, apex broadly rounded, without distinct subapical constriction, summit a little before centre, anterior area convex, densely covered with small subequal asperities and with short sparse erect pubescence, basal area subshining, a few erect short hairs on the sides.

Scutellum submerged and difficult to observe. Elytra slightly wider and 1.6 times as long as pronotum, sides parallel on little more than basal half of elytra, apex broadly rounded, declivity short and limited to distal third, steeply convex. Disc with rows of medium sized, shallow and distantly placed punctures; interstriae moderate in width, with more sparsely placed small punctures with scattered hairs; declivity abruptly truncate, transversely impressed within the third interstria, the latter each with a set of 5 - 6 pointed tubercles.

*Male* : Unknown.

*Distribution* : INDIA : *West Bengal* : Darjiling.

*Remarks* : The species is not yet been recorded elsewhere, except from its type-locality in Darjiling, West Bengal.

## 64. *Xyleborinus spinipennis* (Eggers)

### 1. *Xyleborus spinipennis* Eggers

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 26-27. *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Halflong, Assam, India.

### 2. *Xyleborinus spinipennis* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 817.

*Description : Female* : Body elongate; head, pronotum and elytra light brown. Body length 2.00, 3 times as long as wide.

Frons flatly convex with faint median line; surface with large irregular punctures; club obliquely truncate, anterior face with recurved costate apical margin forming somewhat a complete ring, truncate face with a crescentic suture; posterior face devoid of any suture.

Pronotum slightly longer than broad; anterior margin unarmed; summit prominent, placed almost above the middle, and anterior more than two-fifth with fine asperities, a few extending laterally and with long dense hairs; posterior portion finely reticulate and with sparse punctures and scattered hairs.

Scutellum tuberculate and raised above the level of elytra, scutellar space with dense hairs.

Elytra distinctly longer than pronotum and almost double the width; basal margin substraight; lateral sides subparallel upto anterior three-fourths, whence narrowing posteriorly; discal striae with close shallow punctures, striae 1, 2, 3 and 4 weakly impressed towards declivity; interstriae smooth and punctate and with erect hairs; striae 1-5 somewhat granulate. Declivity somewhat vertical and commencing on and from posterior one-fourth, face convex; all the interstriae on the declivital face with granules or tubercles only at the commencement of declivity, except on interstria 2.

*Male* : Unknown.

*Distribution* : INDIA : Assam : North Cachar Hills : Halflong. ELSEWHERE : None.

*Remarks* : The species is very much close to *X. saxeseni*, but differs in having granules or tubercles on all interstriae on the declivital face except on interstria 2 which are only at the commencement of declivity.

**65. *Xyleborinus subgranulatus* (Eggers)**  
(Fig. 62)

**1. *Xyleborus subgranulatus* Eggers**

1930. Eggers, *Indian Forest Rec. (Ent.)*, 14 (9) : 202, *Holotype* : Female in F.R.I., Dehra Dun.  
*Type-locality* : Sibsagar, Assam, India.

1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 84.

**2. *Xyleborinus subgranulatus* (Eggers)**

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 817.

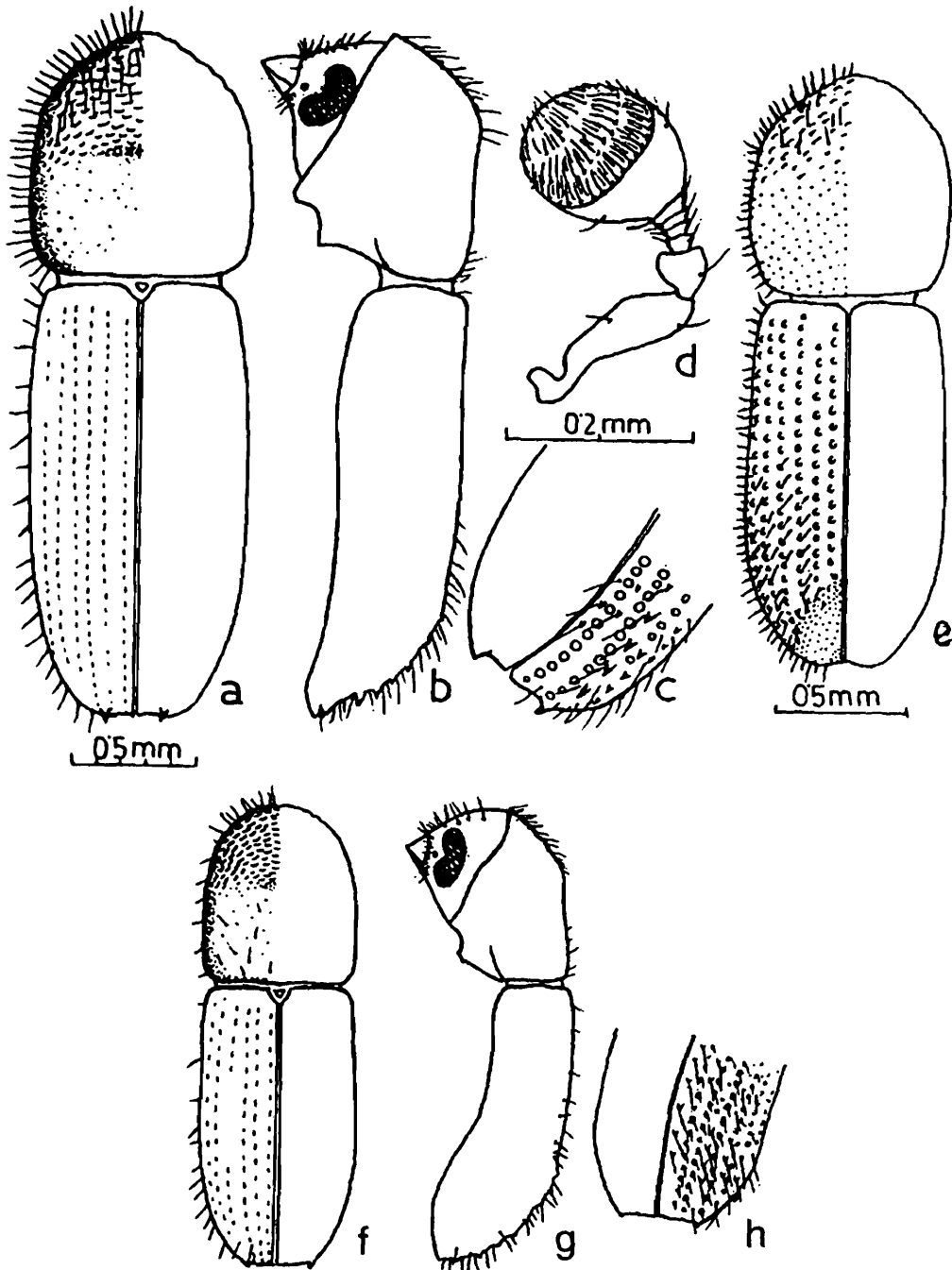
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 828, 830.

*Description* : *Female* : Body small and cylindrical; head, pronotum and elytra yellowish brown to reddish brown; pronotal base, legs and antennae rather paler. Body length 1.60-2.00 mm, nearly thrice as long as wide.

Frons plano-convex; surface finely reticulate with close large irregular punctures with indistinct median line and with a few scattered hairs. Eyes elongately oval, almost half of its width emarginate. Antennal scape short and somewhat stout; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring, truncate face with one conspicuous suture, crescentic in shape; posterior face devoid of any suture.

Pronotum 1.1 times as long as wide; basal margin almost straight; lateral sides straight and subparallel upto basal two-thirds; anterior margin broadly rounded and unarmed; anterior one-third with fine asperities and long close hairs; posterior two-thirds finely reticulate with sparse minute punctures and with a few sparse short hair.

Scutellum reduced and conical, not filling up the scutellar space occupied by tuft of bent hairs.



**Fig. 62** : *Xyleborinus subgranulatus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, enlarged view of elytral declivity; Male : f, pronotum and elytra in dorsal view; g, head, pronotum and elytra in lateral view; h, enlarged portion of elytral declivity

Elytra 1.5 times as long as pronotum and 1.9 times as long as its width; basal margin with broad scutellar emargination, otherwise substraight; lateral sides subparallel upto posterior two-thirds, thence converging posteriorly with broadly rounded apex; discal striae marked by shallow punctures; interstriae smooth and with uniseriate sparse small punctures towards base and laterally, and granules at commencement of declivity; each puncture and granule with a long erect hair. Declivity commencing on apical third, face convex and opaque; strial punctures indistinctly marked, each with a microhair; all the interstriae 3-7 with granules; interstria 2 only with a few granules at the commencement of declivity; interstriae with a few granule upto middle of declivity; strial puncture rather inconspicuous, except laterally.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Sibsagar. West Bengal : Darjiling Dist. : Lepchajagat, Lopchu and Samsingh. ELSEWHERE : None.

*Hosts* : *Anthocephalus chinensis*, *Juglans regia*, *Sapium eugenieafolium* and *Vatica lanceafolia*.

*Remarks* : This small species has so far been found only in Assam, boring saplings of *Vatica lanceafolia*. It is very close to *X. saxeseni* from which it can easily be isolated by its smaller body size and granulate upper half of interstriae at declivital face.

### Genus *Xyleborus* Eichhoff

#### 1. *Xyleborus* Eichhoff

1864. Eichhoff, *Berl. ent. Z.*, **8** : 37.  
 1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 97.  
 1915. Hopkins, *Proc. U. S. nat. Mus.*, **48** : 10, 67, 68.  
 1960. Wood, *B. P. Bishop Mus.*, **18** (1) : 51.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 102.  
 1968. Bright, *Can. Ent.*, **100** (12) : 1296.  
 1978. Wood, *Annl. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.  
 1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96.  
 1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 112-113.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 704-705.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 630.

#### 2. *Anisandrus* Ferrari

1867. Ferrari, *Die Forst und Baumzuchtschadlichen Borkenkafer*, Wien : 24, 25, 26 82.  
 1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 98 (Synonymy).

### 3. *Anaeretus* Duges

1887. Duges, *Ann. Soc. ent. Belge.*, **31** : 141  
 1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 97 (Synonymy).

### 4. *Progenius* Blandford

1896. Blandford, *Annl. Soc. ent. Fr.*, **65** : 20.  
 1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 98 (Synonymy).

### 5. *Heteroborips* Reitter

1913. Reitter, *Wien. ent. Ztg.*, **32** (2) : 79, 111.  
 1934. Schedl, *Winkler Cat. Col.*, p. 1645 (Synonymy).

### 6. *Xyleborips* Reitter

1913. Reitter, *Wien. ent. Ztg.*, **32** (2) : 79, 111.  
 1934. Schedl, *Winkler Cat. Col.*, p. 1645 (Synonymy).

### 7. *Boroxylon* Hopkins

1915. Hopkins, *Proc. U. S. nat. Mus.*, **48** : 10, 58.  
 1952. Schedl, *Ent. Bl.*, **47/48** : 162 (Synonymy).

### 8. *Notoxyleborus* Schedl

1934. Schedl, *Ent. Ber.*, **9** : 84.  
 1978. Wood, *Annl. Soc. ent. Fr. (N.S.)*, **14** (1) : 114.  
 1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96.  
 1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No.* 86 : 100.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 627.

*Type of the genera* : *Xyleborus* : *Bostrichus monographus* Fabricius. *Anisandrus* : *Apate dispar* Fabricius; *Anaeretus* : *Anaeretus guanajuatensis* Duger (= *Bostrichus v. ulus* Fabricius). *Progenius* : *Progenius fleutiauxi* Blandford (= *Xyleborus subcostatus* Eichhoff). *Heteroborips* : *Bostrichus cryptographus* Ratzeburg. *Xyleborips* : *Xyleborus meuseli* Reitter. *Boroxylon* : *Boroxylon stephegynus* Hopkins (= *Phloeotrogus bidenatus* Motschulsky). *Notoxyleborus* : *Notoxyleborus kalshoveni* Schedl.

The most common and diverse genus *Xyleborus* Eichhoff contains some heterogeneous groups of species occurring throughout the world, except in the northern coniferous forests. As such, it has a confused history from the very beginning of its inception in 1864 by Eichhoff with the inclusion of a number of species including *Bostrichus monographus* Fabricius (which was subsequently designated by Hopkins, 1915, as its type-species). However, until now, the genus has been either splitted into

number of genera or many genera have been synonymised under it by different authors, particularly by Schedl (1951/52 and 1962) and Wood (1978). Even, some of the authors, namely, Hagedorn (1910), Schedl (1957), Browne (1961) recognised some species-groups as the subgenera under it. Recently, Wood (1980) studied the genus in details and had either erected or synonymised quite a number of genera on the basis of some sound criteria of the *Xyleborus*.

In their world catalogue, Wood and Bright (1992a and b) had assigned a total of 22 species from India under the genus, of these 17 species have been taxonomically treated in this account. The remaining species, namely, *Xyleborus amphicranoides* Hagedorn, *X. conidens* Eggers, *X. dentatus* Blandford, *X. improcerus* Sampson, could not be included here due to lack of material.

#### **General characters of the genus *Xyleborus* Eichhoff based on females :**

*Female* : Body small and cylindrical to large and stout; colour varies from yellowish brown to complete black, either uniformly coloured throughout or elytra comparatively darker than head and pronotum together. Body length 1.70-5.30 mm; body more or less twice as long as wide (*X. corpulentus*, *X. haberkorni* and *X. mucronatulus*) and in other comparatively slender with 2.50-3.10 times as long as wide.

Head globose, frons convex or plano-convex, with or without any median line; surface finely reticulate with either shallow or deep and either close or sparse punctures and with variable pilosity. Eyes suboval, variable in size, feebly to more than one-third emarginate. Antennal scape short to moderate in length; club generally obliquely truncate (dorso-ventrally flattened in *Xyleborus major*), on anterior face, basal corneous portion large or small with recurved or procurved sharp apical margin forming a complete ring.

Pronotum generally rectangularish, sometimes subglobose; pronotum either as long as wide or longer or wider; basal margin generally substraight; lateral sides subparallel or feebly outcurved; anterior margin broadly to narrowly rounded (weakly produced in *X. bidentatus*, *X. corpulentus*, *X. haberkorni*, *X. major* and *X. mucronatulus*), either armed or unarmed, summit distinct or indistinct, generally placed slightly on or near the middle to anterior one-third; anterior one-third or nearly half with adpeet or distinct asperities and erect hairs; posterior half comparatively smooth with scattered fine punctures and with short or long hairs.

Scutellum either triangular or tongue-shaped.

Elytra 1.4-1.8 times as long as pronotum, nearly 1.2 (*X. corpulentus*)–2.0 times as long as its own width; basal margin substraight; lateral sides generally subparallel upto basal half or two-thirds, sometimes feebly outcurved, thence converging posteriorly (*X. corpulentus* and others) and terminating into narrowly to broadly rounded apices, at times, elytra apex feebly or deeply emarginate (*X. fallax*, *X. emarginatus*, *X. pumilus* and *X. shorea*); discal striae sometimes impressed with uniseriate row of shallow or deep punctures, with variable size, each with a distinct or indistinct

microhair; interstriae either flat or weakly convex, with either punctures or granules, generally granulate towards declivity and with short and long hairs. Declivital face either shiny or opaque; declivity commencing from the middle to posterior one-third; postero-lateral margins generally weakly to strongly carinate (*X. corpulentus* and others), sometimes acutely elevated provided with tubercles, indistinctly at times carinate (*X. cognatus*, *X. perforans*, *X. similis* and others). Declivital face either convex or plano-convex or weakly concave, generally either of the interstriae 1 or 2 or both devoid of any granule or tubercle, except a few at the commencement of the declivity, but sometimes all the declivital interstriae with granules or tubercles (*X. glabratus*); striae marked by shallow or distinct punctures; postero-lateral margins acute or broadly margined, with or without carinae. In some species (e. g. *X. fallax*, *X. emarginatus*, *X. pumilus* and *X. shorea*), declivital face completely different from the other species of the genus. Declivital face shiny, shallowly excavate (surface devoid of any granule or tubercle) forming somewhat ridge laterally set with distinct spines or granules and elytral apex either with weak or strong emargination.

#### Key to the species of *Xyleborus* Eichhoff based on females

1. Declivital face shallowly excavate, sutural interstria weakly elevated, excavital margin forming somewhat ridge, set with distinct spines and granules; elytral apex either with weak or strong emargination ..... 2
  - Declivital face either convex or plano-convex or weakly concave, but without any excavation; declivital face with granules or tubercles or sometimes with both; elytral apex devoid of any distinct emargination ..... 5
2. Elytral apex with a very weak emargination, each elytral apex individually rounded; only interstria 2 with a distinct tubercle on upper half of declivity; smaller species, below 2.00 mm ..... *X. pumilus* Eggers
  - Elytral apex with a broad inverted "U" - shaped emargination; both interstriae 2 and 4 with a very large and pointed tubercles on upper half of declivity; larger species, above 2.00 mm ..... 2
3. Excavated surface of declivity only with a few scattered puncture, but devoid of any distinct stria; body length 3.55-3.65 mm ..... *X. emarginatus* (Eichhoff)
  - Excavated surface of declivity with distinct striae marked by punctures, outcurved at middle ..... 3
4. Distance between spine 2 and 3 on excavated margin much greater than that between 1 and 2; species more stout, body length 3.00-3.15 mm .....
  - ..... *X. shoreae* (Stebbing)
  - Distance between each of the three spines on excavated margin almost equal; species more slender, body length 3.00 mm ..... *X. fallax* Eichhoff

5. Anterior margin of pronotum distinctly produced and distinctly armed with asperities; species comparatively short and stout (2.0-2.5 times as long as wide) ..... 6
  - Anterior margin of pronotum not at all produced, but with or without any asperities; species comparatively long and slender (2.5-3.1 times as long as wide) ..... 10
6. Larger species, body length 3.00-5.30 mm ..... 7
  - Smaller species, body length 1.70-2.15 mm ..... 8
7. Declivital face with one distinct tubercle at the middle of interstria 2, other interstriae with minute granules, body-length 3.50-3.70 mm ..... *X. bidentatus* (Motschulsky)
  - Declivital face with irregular minute tubercles almost in all interstriae, but devoid of any large tubercles; body-length 5.00-5.30 mm ..... *X. major* (Stebbing)
8. Interstriae 2 and 3 with comparatively distinct granules at the commencement of declivity; strial punctures small; entire declivital face with fine pubescence; body length 2.0-2.15 mm ..... *X. corpulentus* Eggers
  - Interstriae 2 and 3 with only one fairly large pointed tubercle at the commencement of declivity; strial punctures large and distinct; declivital face devoid of distinct hairs ..... 9
9. Antero-median margin of pronotum angularly produced, accommodating 4 distinct and somewhat pointed asperities, median two much longer than the others; more than basal half of pronotum smooth and punctate; body length, 1.70 mm ..... *X. mucronatulus* Eggers
  - Antero-median margin of pronotum not angularly produced, somewhat narrowly rounded accommodating 4 distinct transverse asperities, median two slightly longer; only basal half of pronotum smooth and punctate; body length 2.00-2.10 mm ..... *X. haberkorni* Eggers
10. Larger species, body length, 3.40 mm ..... *X. conditus* Schedl
  - Smaller species, body length, 1.85-2.50 mm ..... 11
11. All the declivital interstriae with granules or tubercles; declivital face abruptly sloping and with scanty hairs, only interstria 1 with a few large tubercles and rest with close granules; elytral apex narrowly rounded; body length 2.20-2.25 mm ..... *X. glabratus* Eichhoff
  - All the declivital interstriae with distinct granules or tubercles except on 2, if at all present, present at the commencement of declivity ... ..... 12
12. Declivital interstriae either 1 or 3 comparatively wider than others, accommodating one large tubercle, conspicuously larger than others ..... 13

- Declivital interstria 1 or both 1 and 3 comparatively wider than others, bearing a few tubercles or granules of more or less of equal shape and size ..... 15
- 13. Declivital interstria 3 with one larger tubercle placed almost at the middle of declivity; discal interstriae usually almost impunctate; body length 2.40-2.50 mm ..... *X. ferrugineus* (Fabricius)
- Declivital interstria 1 with large tubercle; discal interstriae more or less punctate; body length 1.85-2.50 mm ..... 14
- 14. Tubercle on sutural interstria placed more or less at middle of declivity; frons with close punctures and distinct median line; elytral apex narrowly rounded, devoid of any emargination; postero-lateral margins of declivity with granules and declivital face rather abrupt; body length 2.30-2.50 mm ... *X. similis* Ferrari
- Tubercle on sutural interstria placed more posteriorly; frons with a few sparse punctures and without any median line; elytral apex feebly emarginate; postero-lateral margins of declivity without any granules and declivital face not abrupt, rather gradually sloping; body length 1.85 mm ..... *X. shiva* Maiti & Saha
- 15. Frons with coarse deep punctures; surface of elytral declivity coarsely opaque, comparatively darker than disc; declivital tubercles distinctly slender and pointed, elytral disc densely hairy; body length 2.00-2.45 mm ..... *X. cognatus* Blandford
- Frons with fine shallow punctures; surface of elytral declivity smooth and shiny or opaque, almost same colour as in disc, declivital tubercles blunt and large; elytral disc less hairy ..... 16
- 16. Surface of elytral declivity smooth and shining; declivital tubercles large and of almost equal size; declivity comparatively steep, more convex ..... *X. perforans* (Wollaston)
- Surface of elytral declivity opaque; declivital tubercles comparatively of smaller size; declivity more gradually sloping, less strongly convex; body length 2.00- 2.70 mm ..... *X. affinis* Eichhoff

## 66. *Xyleborus affinis* Eichhoff

### 1. *Xyleborus affinis* Eichhoff

1867. Eichhoff, *Berliner Ent. Zeitschr.*, **11** : 40. *Syntype* : Female in Hamburg Mus. (lost) : 1 type in U. S. Nat. Mus., Washington. *Type-localities* : America and Cuba.

1929. Beeson, *Brit. Mus. Nat. Hist.*, **4** (4) : 245.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 706-709 (detailed synonymies).

*Description* : *Female* : Body elongate, colour yellowish to light reddish brown. Body length 2.00-2.70 mm, 2.8 times as long as wide.

Frons convex, normally with distinct prominence between eyes; surface reticulate and sparsely punctate; distinctly hairy except along epistoma. Eyes more than one-third emarginate.

Pronotum 1.12 times as long as wide, almost subparallel on more than basal half; anterior margin broadly rounded and unarmed; summit just in front of middle; anterior declivous area somewhat finely asperate, posterior area with fine punctures and disc shining, rather obscurely reticulate at sides, inconspicuously hairy.

Elytra 1.7 times as long as wide, 1.5 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, slightly narrowly rounded behind; indistinct striae marked by shallow punctures; interstriae wider than striae, smooth and shining with fine punctures, irregular in shape, size and spacing. Declivity somewhat steep, weakly convex, surface dull; interstriae 1 and 3 each with about 3-5 small tubercles, normally two on each interstria, somewhat larger than the others; interstria 2 unarmed or with one or two minute granules near declivital base; interstriae 4, 5 and 6 usually with 1-3 small tubercles on upper half of declivity; declivital striae with row of minute hairs, sometimes with long, erect hairs also.

*Male* : Almost similar to female except smaller in size but stouter, body length 2.0 mm. Eyes degenerated to about one and a half times than that of female; anterior declivous portion of pronotum impressed with feeble concavity with anterior submargin more or less obtusely mucronate.

*Distribution* : INDIA : ELSEWHERE : All over the tropics and subtropics.

*Remarks* : This widely distributed species is very similar to *X. perforans*, but can be distinguished with difficulty from it by less strongly convex declivity with smaller declivital tubercles and dull surface.

### 67. *Xyleborus bidentatus* (Motschulsky)

(Fig. 63)

#### 1. *Phloeotrogus bidentatus* Motschulsky

1863. Motschulsky, *Bull. Soc. Imp. Nat. Moscou.*, **36** (2) : 514, *Type* : Repository of type not mentioned, 1 female in Brussel Mus. and 1 metatype female in Mus. Nat. Hist., Wien.  
*Type-locality* : Myanmar.

#### 2. *Xyleborus bidentatus* (Motschulsky)

1879. Eichhoff, *Mem. Soc. Roy. Sci. Liege*, **8** (2) : 505.

1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 282-285.

1971. Schedl, *Steenstrupia*, **1** : 148.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ., Paper No. 86* : 115-118, Fig. 30, a and b.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 715-716.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 831-832.

**3. *Xyleborus richli* Eichhoff**

1878. *Mem. Soc. Roy. Sci. Liege*, **8** (2) : 346-347, Female. *Type-locality* : Celebes.  
 1930. Eggers, *Indian Forest Rec. (Ent.)*, **14** (9) : 190, Male from Sundarban, India.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 282 (Synonymy).

**4. *Progenius laeviusculus* Blandford**

1896. Blandford, *Ann. Soc. Ent. Fr.*, **65** : 21-22, Female, *Type-locality* : Indo-China.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 282 (Synonymy).

**5. *Xyleborus (Progenius) laeviusculus* (Blandford)**

1914. Stebbing, *Indian Forest Insects* (Coleopt.), p. 602.  
 1922. Beeson, *Indian Forester*, **48** : 498.

**6. *Boroxylon stephegynis* Hopkins**

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 58, Female, *Type-locality* : Mindono, Philippines.  
 1952. Schedl, *Ent. Blatt.*, **47/48** : 162 (Synonymy).

**7. *Xyleborus brevidentatus* Eggers**

1930. Eggers, *Indian Forest Rec. (Ent.)*, **14** (9) : 190-191, Female, *Type-locality* : Andaman Islands, India.  
 1930. Beeson, *Indian Forest Rec. (Ent.)*, **14** (10) : 228.  
 1952. Schedl, *Ent. Blatt.*, **47/48** : 188 (Synonymy).

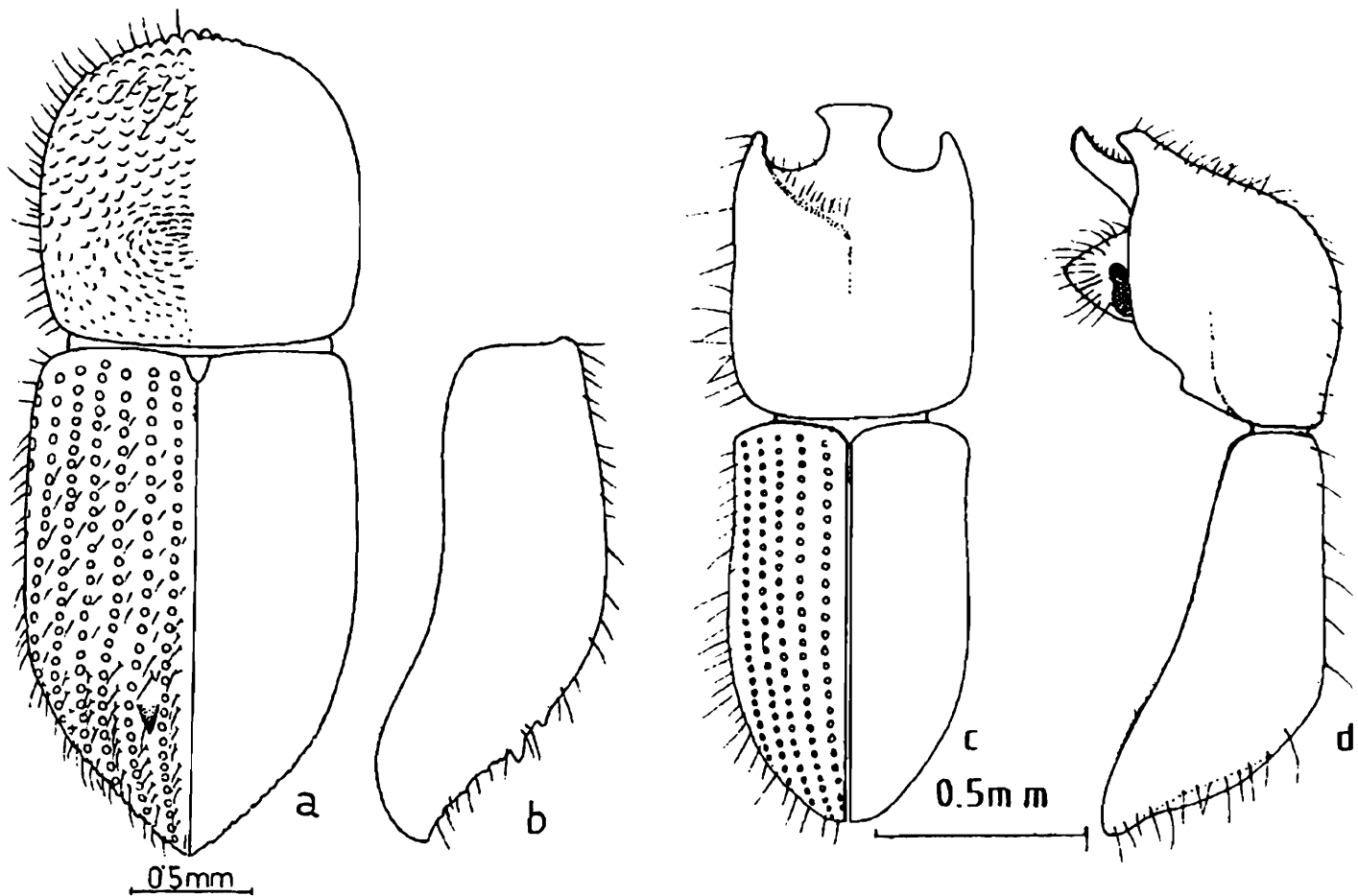
**8. *Xyleborus quadridens* Eggers**

1930. Eggers, *Indian Forest Rec. (Ent.)*, **14** (9) : 191, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Borneo.  
 1989. Wood, *Gt. Basin Nat.*, **49** : 176 (Synonymy).

*Description* : *Female* : Body elongate, moderately tapering towards apex; colour blackish brown to completely black. Body length 3.50-3.70 mm, 2.5 times as long as wide.

Frons moderately convex, with a transverse depressed area above epistoma on either side of median line; surface finely reticulate with large deep, close punctures and sparse long hairs. Antennae as in other species, antennal club with segment 2 distinct and posterior face with two distinct sutures.

Pronotum subquadrate, nearly as long as wide; lateral sides slightly outcurved, antero-median portion slightly produced bearing 6-7 weak asperities; distinct transverse summit at the middle; anterior portion with transverse coarse asperities in concentric



**Fig. 63** : *Xyleborus bidentatus* (Motschulsky), Female : a, Pronotum and elytra in dorsal view; b, elytra in lateral view.; Male : c, Pronotum and elytra in dorsal view; d, head (partially) pronotum and elytra in lateral view.

rows gradually becoming feeble postero-laterally and also extending below the summit; posterior portion coarsely reticulate with few granules; surface with sparse long erect hairs.

Scutellum large, smooth, shiny and subround.

Elytra 1.7-1.8 times as long as and nearly as wide as pronotum, 1.6 times as long as its width; basal margin of each elytron moderately outcurved; lateral sides subparallel up to middle, then slightly diverging and again converging posteriorly into a somewhat tapering apex; discal striae moderately impressed, punctures large and shallow; interstriae broader than striae, weakly convex, surface coarse with irregular punctures with inconspicuous sparse hairs. Declivity convex, rather steep, commencing almost from the middle, strial punctures more distinct and with microhairs; interstriae rather weakly convex with granules and erect hairs throughout; interstria 2 with a large sharply pointed tubercles.

*Male* : Body cylindrical; completely different from the female, particularly the pronotum; colour reddish brown; body length about 3.50 mm. Head completely

concealed under the anterior projection of pronotum. Pronotum longer than broad, lateral sides subparallel; anterior one-fourth of pronotum strongly projecting anteriorly like a truncate spoon with projecting antero-lateral corners; surface with sparse punctures and small hairs as well as dense pubescence on anterior truncated portion. Elytra more or less as in female, but devoid of large tubercle on interstria 2.

*Distribution* : INDIA : *Andaman and Nicobar Islands* : North, Middle, South Andaman and Nicobar Islands; *West Bengal* : Sundarban. ELSEWHERE : Myanmar, Malaysia, Indonesia (Borneo, Java, Sumatra, Sumbawa and Celebes), Thailand, Vietnam, New Guinea, Philippines, East Africa, Madagascar and Australia.

*Hosts* : *Canarium euphyllum*, *Dipterocarpus turbinatus*, *Excaecaria agallocha*, *Mimusops littoralis*, *Pterocarpus dalbergoides*, *Sonneratia apetala*, *Terminalia bialta* and *T. procera*.

*Remarks* : The species was first established under the genus *Phloeotrogus* as early as in 1863 and then transferred to the genus *Xyleborus* in 1879 by Mostchulsky. The species is a very distinct one by its strongly tapering elytral apices and declivital interstria 2 with one strong tubercle. However, the range of variations and its distribution have been widened, since many species have been merged under it. It is a well recognised pin-hole borer and infests many host plants as referred to above (Eggers, 1930; Beeson, 1941; Maiti and Saha, 1986 and Wood and Bright, 1992). It infests mangrove plants in the Sundarban as well as in the Andamans.

## 68. *Xyleborus cognatus* Blandford (Fig. 64)

### 1. *Xyleborus cognatus* Blandford

1896. *Ann. Soc. Ent. Fr.*, **65** : 19-20, *Type* : Female in B.M.N.H., London and 2 Metatypes in *Nat. Hist. Mus.*, Wien. *Type-locality* : Sigon, Vietnam.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 99.
1912. Hagedorn, *Rev. Zool. Afr.*, **1** (3) : 344, Male from Sri Lanka.
1961. Browne, *Malay. Forest Rec.*, No. 22, p. 144.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 49.
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 118-121, Fig. 31, a-b.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 719.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 832, 833.

*Description : Female* : Body moderately long and cylindrical; light brown to reddish brown in colour, elytral apex comparatively darker. Body length 3.00-3.45 mm, nearly thrice as long as wide.

Frons weakly convex, slightly depressed above the epistoma; surface coarsely reticulate with close, scattered large punctures and erect hairs. Antennal club obliquely truncate; on anterior face, basal corneous portion reaching beyond half with recurved apical margin; truncated face with two distinct sutures; posterior face with one suture apically.

Pronotum as long as wide or slightly longer; basal margin substraight and lateral sides feebly outcurved; anterior margin broadly rounded and unarmed; in profile, dorsal margin almost straight up to middle whence sloping anteriorly with feebly convex surface; declivous portion with small, but distinct asperities gradually becoming larger towards apex, minute asperities extending postero-laterally; posterior half smooth and shining with fine scattered punctures; anterior declivous area with long erect hairs and also a few laterally.

Scutellum moderate in size, almost triangular in shape, smooth and shiny.

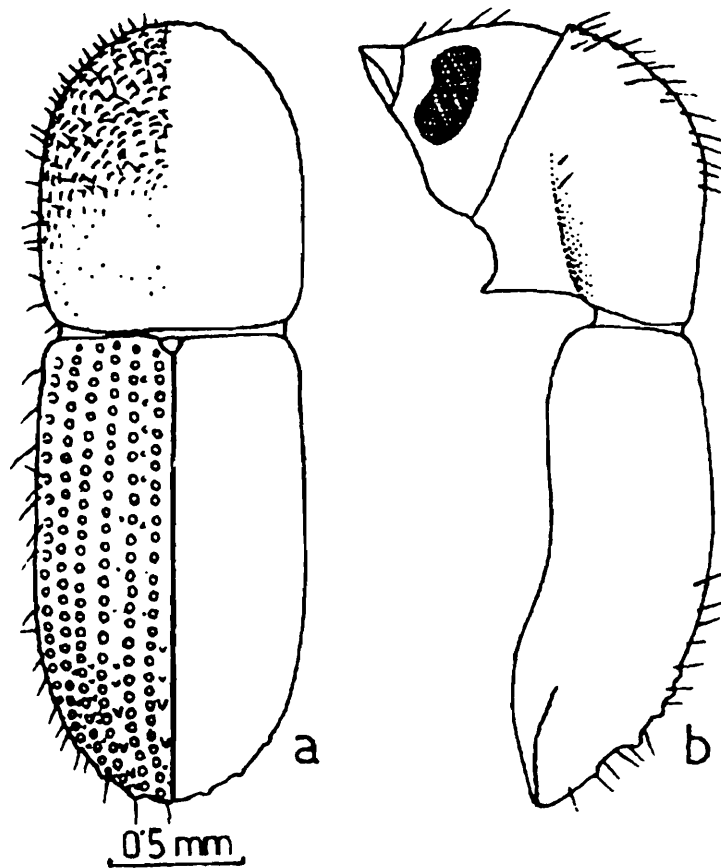


Fig. 64 : *Xyleborus cognatus* Blandford, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Elytra 1.6 times as long as and as wide as pronotum and twice as long as its own width; basal margin substraight with distinct humeral callus on interstria 7; lateral sides subparallel up to basal two-thirds, thence weakly narrowing posteriorly with rounded apex; discal striae marked by distinct shallow closely set punctures; interstriae slightly wide than striae with irregular small setaeferous punctures as well as with

a few minute granules becoming prominent at the commencement of declivity, particularly more prominent on interstria 1. Declivity commencing on posterior third, face plano-convex; postero-lateral sides elevated bearing fine granules; striae with a few uniseriate broad based tubercles, others with comparatively smaller one except interstria 2; all interstriae with sparse erect hairs.

*Male* : Body reduced, pronotum highly modified, reddish brown in colour, pronotum somewhat blackish brown. Body length 2.00-2.50 mm.

Pronotum highly modified, subquadrate, basal margin moderately outcurved, postero-lateral corners broadly rounded, lateral sides in basal half subparallel, thence converging anteriorly and terminating into a thick blunt point, moderately curved upwards; in profile, anterior half sloping, a marked depression with blunt prominent tubercles; posterior half coarsely granulate.

Elytra subrectangular, about 1.3 times as long as wide, almost as wide as pronotum; basal margin weakly incurved, elytral declivity weak, commencing in posterior half and provided with distinct granules.

*Distribution* : INDIA : *Andaman Islands* : North, Middle and South Andamans. *Bihar* : Samta Reserve, Singhbhum. *Uttar Pradesh* : Dehra Dun. *West Bengal* : Sundarban. ELSEWHERE : Myanmar, Sri Lanka, Malaysia, Indonesia (Java, Borneo and Sumatra). thailand, Vietnam, Philippines, Indo-China, New Guinea, Fiji Islands, Bougainville Island, Solomon Islands and Australia.

*Hosts* : *Bauhinia variegata*, *Bruguiera gymnorhiza*, *B. parviflora*, *Canarium euphyllum*, *Diospyros oocarpa*, *Dipterocarpus turbinatus*, *Excaecaria agallocha*, *Heritiera fomes*, *Lagerstroemia hypoleuca*, *Mimusops littoralis*, *Planchonia andamanica*, *Parishia insignis*, *Pterocarpus dalbergioides*, *Rhizophora mucronata*, *Salmalia insigne*, *Shorea robusta*, *Sterculia alata*, *S. campanulata*, *Terminalia bialata* and *T. procera*.

*Remarks* : The species is fairly common in the major mangrove forests of the south-east Asia infesting numerous host-plants. It is very close to *Xyleborus perforans* Wollaston from which it can be hardly separated. But, the more darker elytral declivity with comparatively large tubercles serves as its differentiating character to some extent. It is known to infest *Heritiera fomes* and *Excaecaria agallocha* in the Sundarban, West Bengal. The emargence of adult has been observed in the month of February in Sundri jungle of the Sundarban (Beeson, 1930, 1941).

## 69. *Xyleborus conditus* Schedl

### 1. *Xyleborus conditus* Schedl

1971. Schedl, *Oriental Ins.*, 5 (3) : 379, *Holotype* : Female in Mus. Nat. Hist. Wien. *Type-locality* : Dehra Dun, Mussoorie, 2006 m, Uttar Pradesh, India.

1973. Schedl, *Ent. Blatt.*, 69 (3) : 211.

1980. Schedl, *Nat. Mus. Wien. Entomologie*, **3** (2) :

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 6 (Vol.-A) : 719.

*Description : Female* : Body ferruginous. Body length 3.40 mm, 2.8 times as long as wide.

Frons subopaque, broadly convex, minutely punctulate, rather coarsely but with shallow puncture, punctures with long hairs.

Pronotum 1.1 times as long as wide; postero-lateral angles a little more than rectangular and distinctly rounded, the sides feebly divergent on basal third, anterior margin broadly rounded, the subapical constriction hardly noticeable, summit at the middle, moderately high, anterior area convex, covered with small asperities, some extending beyond summit laterally; basal area moderately finely punctured, pubescence short and erect but rather densely placed.

Scutellum moderate in size, shining and impunctate.

Elytra slightly wider and 1.5 times as long as pronotum; lateral sides parallel on basal half, broadly rounded posteriorly; disc shining, striae feebly impressed, striae punctures moderate in size and rather closely placed; interstriae moderate in width, with a fairly regular row of smaller punctures, each with short semi-erect hair. Declivity commencing after basal half, declivital striae more strongly impressed, interstriae feebly convex and with small setose granules.

*Male* : Unknown.

*Distribution* : INDIA : *Uttar Pradesh* : Dehra Dun (Mussoorie ) ELSEWHERE : Nepal.

*Remarks* : The species is extremely rarely found in India and so far known only from its type-locality. Nothing is known about its biology, even about its host-plants.

## 70. *Xyleborus corpulentus* Eggers

(Fig. 65)

### 1. *Xyleborus corpulentus* Eggers

1930. Eggers, *Indian Forest Rec.*, (Eng.), **14** (9) : 22-23, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Upper Dihing Reserve, Lakhimpur, Assam, India.

1973. Schedl, *Ent. Blatt.*, **69** (3) : 211.

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 121-123, Fig. 32, a-c.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 720.

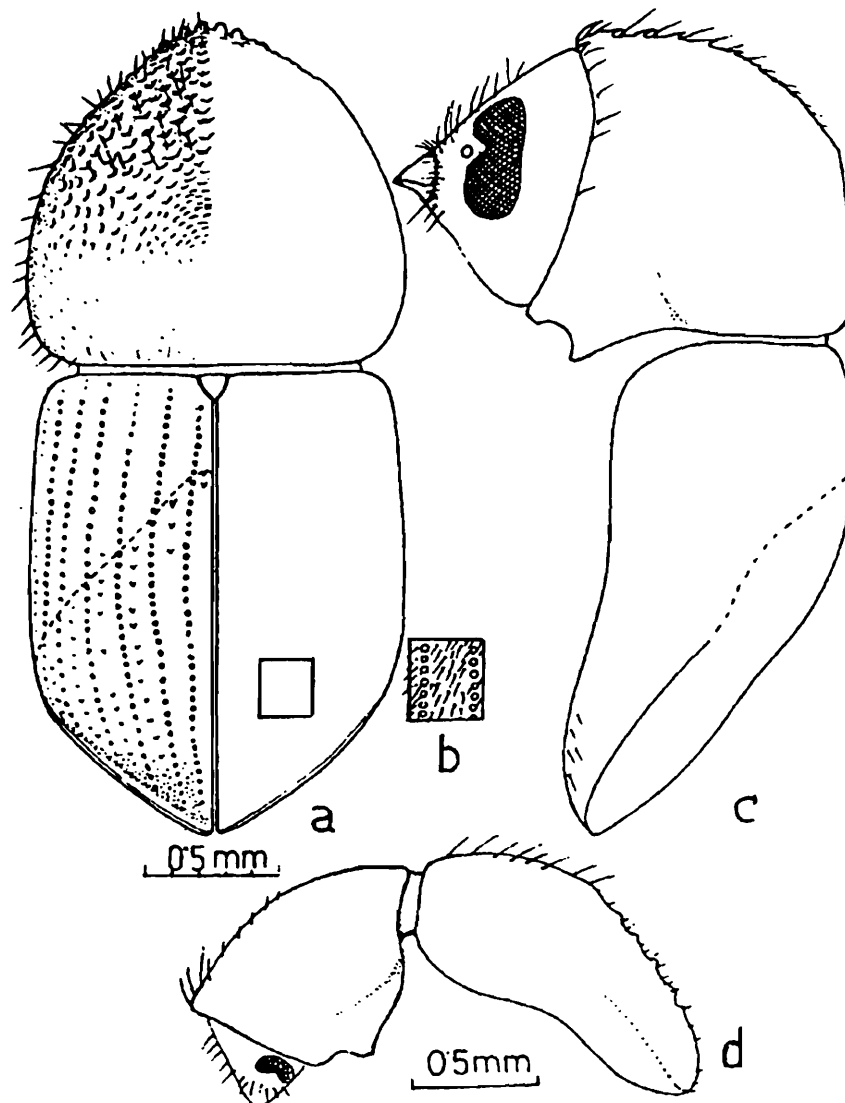
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 831, 833.

*Description : Female* : Body short and stout; head, pronotum and elytra straw yellow to yellowish brown; legs and antennae slightly paler. Body length 2.90-3.05 mm and 2-1 times as long as wide.

Frons plano-convex, surface finely reticulate with distinct shallow sparse punctures and with indistinct median line. Antennal club obliquely truncate, on anterior face, basal corneous portion with distinct recurved costate apical margin forming a complete ring being subapical on posterior face indicating an apical suture on posterior face, truncate face with two more sutures.

Pronotum globose, nearly 1.2 times as wide as long; basal margin substraight, postero-lateral angles broadly rounded; sides bulging out and converging anteriorly terminating into an angular projection armed with 5-6 asperities having larger ones at the middle; distinct summit almost at the middle; anterior declivous portion armed with distinct triangular asperities in concentric rows, gradually increasing in size anteriorly and with long erect hairs; posterior half shiny, finely reticulate and punctate, without having any conspicuous hairs, except a few on basal margin.

Scutellum triangular.



**Fig. 65** : *Xyleborus corpulentus* Eggers, Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral declivity; c, head, pronotum and elytra in lateral view. Male : d, head, pronotum and elytra in lateral view.

Elytra 1.46 times as long as and as wide as pronotum, 1.2 times as long as its width; basal margin substraight; lateral sides subparallel upto basal two-thirds, thence converging posteriorly into an angular apex; postero-lateral margins strongly carinate and confluent with interstria 7; striae marked by close fine punctures; interstriae more than 4 times as wide as striae, surface flat with irregular punctures and inconspicuous hairs. Declivity commencing from slightly above the middle, surface opaque, flatly concave on apical half; striae with irregular small punctures; declivital interstriae weakly convex, except 1 and 2; interstria 1 narrowest, interstriae 1 and 2 only with a few granules at commencement of declivity, rest of the interstriae with uniseriate row of distantly placed granules upto apex and with minute hairs and a few long hairs along lateral sides. Procoxae contiguous, protibiae with 5 teeth and both Meso- and Meta-tibiae with 6-7 teeth.

*Male* : Males are very similar to females in its overall external morphology except in the following characters : Body reduced, small and stout; body length 1.90-2.00 mm, 1.7 times as long as wide. Frons with shallow punctures on reticulate surface and eyes feebly emerginate. Pronotum uniformly convex from base to apex; anterior margin weakly produced but unarmed; anterior half with transverse asperities, inconspicuous long erect hairs more anteriorly and laterally.

Elytra as in female, but strial and interstitial punctures very shallow. Declivital interstriae 1, 2 and 3 with small tubercles, those on interstria 2 only at declivital basal half and those on 1 and 3 obsolete towards the apex; other interstriae with sparse granules; postero-lateral margins distinctly carinate and elevated; hairs inconspicuous.

*Distribution* : INDIA : Assam : Lakhimpur, Upper Dihing Reserved. Andaman Islands : North and Middle Andaman. West Bengal : Darjiling Dist., Samsingh and Sukna. ELSEWHERE : Nepal, Tibet and China.

*Hosts* : *Acrocarpus fraxinifollius*, *Albizia lebbek*, *Atrocarpus chaplasi*, *Canarium euphyllum*, *Cryptocarya wightiana*, *Sterculia villosa*, *Vatica lanceaefolia*.

*Remarks* : *Xyleborus corpulentus* occurs sparsely in the eastern India and Nepal. The characteristic elytral declivity (commencing from slightly above the middle), carinate postero-lateral margins of elytra, armed pronotum, etc., keep the species separate from all other species of *Xyleborus* known so far.

It is known to be associated with half a dozen of host-plants in the eastern India including the Andamans (Beeson, 1930 and 1941; and Maiti and Saha, 1986).

### 71. *Xyleborus disper* (Fabricius)\*

#### 1. *Apate disper* Fabricius

1792. Fabricius, *Ent. Syst. emend. aucta. secundum classes*. 1 (2) : 363. Syntypes : Female, Germaniae; UZMC, Copenhagen.

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\*Not included in the key due to non-availability of material.

## 2. *Bostrichus brevis* Panzer

1793. Panzer, *Fauna Germanica*, 8 : 34.

1910. Hagedorn, *Coleopt. Cat.*, 26 (4) : 102 (Synonymy).

## 3. *Xyleborus cerasi* Eggers

1937. Eggers, *Ent. Blatt*, 33 : 335, *Holotype* : Female; Montella, Avellion, Italy.

## 4. *Xyleborus disper* (Fabricius)

1982. Wood, *Gt. Basin Nat. Mem.* No. 6, pp. 794-795 (detailed synonymy).

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 725-730, (detailed synonymy).

*Description : Female* : Body broadly elongated, colour dark brown to black. Body length 2.80-3.50 mm, 2.2 times as long as broad.

Frons broadly convex, transversely feebly impressed above epistoma; surface reticulate and with small, shallow, fairly close punctures; inconspicuously hairy.

Pronotum 0.93 times as long as wide; widest at the basal third, sides rather strongly arcuate and broadly rounded anteriorly and slightly produced medially accommodating six to eight coarse asperities; summit almost at the middle; anterior declivous portion with coarse asperities; posterior portion reticulate with fine and shallow punctures; hairs short on disc, long on lateral and anterior margins.

Elytra 1.1 times as long as wide, 1.3 times as long as elytra; lateral margins straight and parallel on basal three-fourths, terminating into obtusely subangulate at the apex; striae with deep coarse punctures; interstriae smooth, shining, twice as wide as striae with rather fine and confused punctures. Declivity not so steep; striae slightly impressed, interstitial punctures unisereate, granules on declivity averaging slightly larger and elevated, subapical postero-lateral margins minutely sinuate not really serrate or armed by denticles and fairly hairy.

*Male* : Body smaller, length 1.50-1.80 mm, dwarfed strongly convex; head very similar to that of female; pronotum as in female; except much more broadly convex with indistinct summit, surface smooth, shiny, anterior margin with feeble asperities, anterior slope with more coarse asperities; hairs short.

*Distribution* : INDIA : ELSEWHERE : Asia : China, Turkey, East U.S.S.R., North America and Europe (introduced).

*Remarks* : The species can be separated from *X. obesus* Le Conte by the absence of denticles on the postero-lateral margins of elytral declivity. It is also very close to *X. savi* (Hopkins), but can be distinguished by the larger body size and more number of asperities on anterior margin of pronotum.

72. *Xyleborus emarginatus* Eichhoff  
(Fig. 66)

1. *Xyleborus emarginatus* Eichhoff

1878. Eichhoff, *Stettin ent. ztg.*, **39** : 392. 1 Female in Stettiner Mus., 1 Female Metatype in Wien Mus. and 1 Female Metatype in U. S. Nat. Mus., Washington. *Type-localities* : Myanmar.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 52.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 733.

2. *Coptoborus emarginatus* (Eichhoff)

1915. Hopkins, *U.S. Dept. Agric. Rep.*, **99** : 53.
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 76-79.

3. *Tomicus cinchonae* Veen

1897. Veen, *Notes Lyden Mus.*, **19** : 133, Male and Female. *Type-locality* : Java, Indonesia.
1959. Kalshoven, *Ent. Ber.*, **19** : 96 (Synonymy).

4. *Xyleborus cordatus* Hagedorn

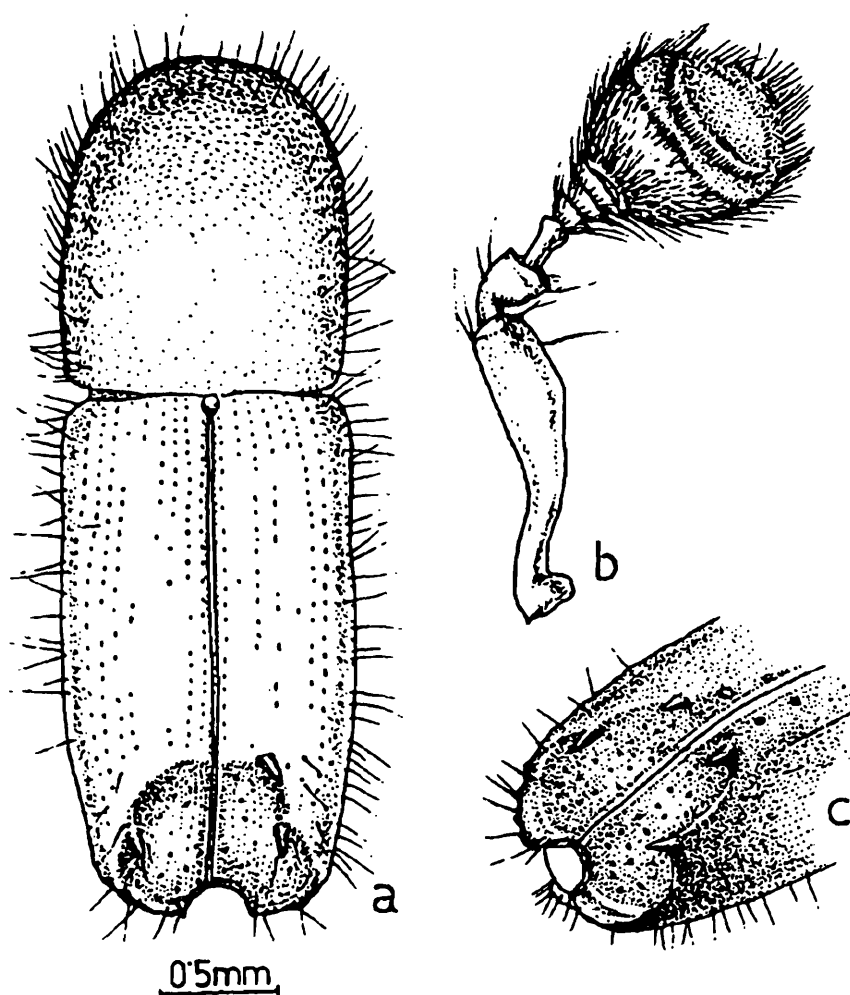
1910. Hagedorn, *Dt. ent. Z.*, **12** : 1, Female. *Type-locality* : Mentawai Isl., Indonesia.
1927. Eggers, *Treubia*, **9** : 402, Male.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 52 (Synonymy).

*Description* : *Female* : Body long and cylindrical; head blackish brown, pronotum and elytra completely black; antennae and legs light brown. Body length 3.55-3.65 mm, 2.9 times as long as wide. Frons plano-convex, surface with deep punctures and hairs except on median raised line; a transverse depressed area in between vertex and frons. Basal corneous portion of antennal club with substraight distinct margin.

Pronotum exactly similar to general features of genus.

Scutellum smooth and rounded at apex.

Elytra 1.5 times as long as and as wide as pronotum, 1.7 times as long as its own width; lateral sides subparallel upto basal three-fourths, whence weakly narrowing posteriorly, with strong emargination at apex; discal striae feebly impressed marked by large punctures, without any microhair; interstriae smooth, shiny and flat, nearly thrice as wide as striae with uniseriate small sparse punctures and long erect hairs. Declivity commencing on posterior third, face shallowly excavate; sutural interstriae elevated, excavital margin elevated and with distinct spine; declivital striae indistinct; punctures at excavated surface irregularly placed and devoid of any hair; interstria 1 with two small granules just before the commencement of declivity; interstria 2 with one large tubercle, largest one placed at interstria 4; excavital margin with



**Fig. 66** : *Xyleborus emarginatus* Eichhoff, Female : a, Pronotum and elytra in dorsal view; b, antenna; c, enlarged portion of elytral declivity.

granules from 2nd tubercle upto apex terminated by a tubercle. Procoxae contiguous, protibiae with 5 teeth and mid- and hind-tibiae with 7 teeth.

*Male* : Not available for study.

*Distribution* : INDIA : *Great Nicobar* : Campbell Bay. ELSEWHERE : Laos; Sri Lanka; Philippines; Fukien; Malaysia; Myanmar; Indonesia (Borneo, Java, Sumatra and Mentawai Island), New Guinea, China and Australia.

*Hosts* : *Myristica* species.

*Remarks* : *Xyleborus emarginatus* Eichhoff can readily be distinguished from its closest species *C. pumilus* (Eggers) by its larger body size and deep emargination on elytral apex. It is rather a variable species of short hole borers, found widely distributed in the south-east Asia. The species is recorded for the first time from India from the insular area of the Great Nicobar Isl. infesting the soft wood of a felled *Myristica* log (Maiti and Saha, 1986). It is very common species in Malaysia and infests numerous host-plants including the deberked logs and swan timbers (Beeson, 1941; Browne, 1961). The species shows probably least preference for particular host.

73. *Xyleborus fallax* Eichhoff1. *Xyleborus fallax* Eichhoff

1878. Eichhoff, *Stett. ent. Zeit.*, **39** : 508, *Holotype* : Female in IRSNB, Burssels (2 metatypes in Nat. Hist. Mus. Wien.). *Type-locality* : Myanmar.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 735.

2. *Xyleborus ampicranulus* Eggers

1923. Eggers, *Zool. Med.*, **7** : 204, Female.
1942. Eggers, *Tijdschr. V. Ent.* **85** : 42, Male
1989. Wood, *Gt. Basin Nat.*, **49** : 176 (Synonymy).

*Description* : Since the characters are similar to *X. shorea* (Stebbing), those are not included here to avoid repetition. However, differentiating characters are indicated in the key.

*Distribution* : INDIA : Assam. ELSEWHERE : Malaysia, Nepal, Vietnam, Indonesia, New Guinea and Philippines.

74. *Xyleborus ferrugineus* (Fabricius)  
(Fig. 67)1. *Bostrichus ferrugineus* (Fabricius)

1801. Fabricius, *Systema Eleutheratorum*, **2** : 388. *Lectotype* : Female in Copenhagen Mus., Denmark.

2. *Xyleborus ferrugineus* (Fabricius)

1867. Ferrari, *Coleoptera Hesperidum*, p. 114.
1982. Wood, *Gt. Basin Nat. Mem.* No. 6, pp. 827-830 (detailed synonymies of 16 species).
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 735-739.

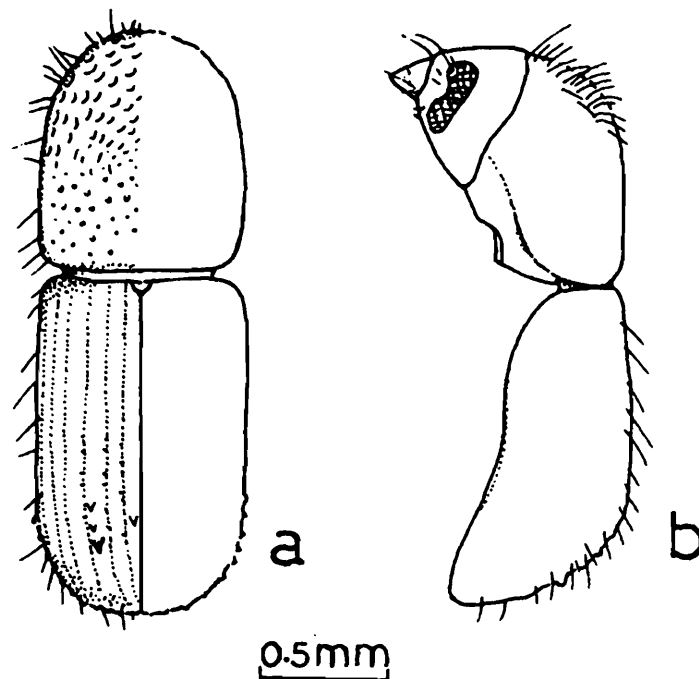
*Description* : *Female* : Body somewhat long and cylindrical; head, pronotum and elytra reddish brown; antennae and legs slightly paler. Body length, 2.38-2.40 mm.

Frons weakly convex; surface reticulately shining, punctures minute rather sparse along with sparse minute hairs.

Pronotum rectangular, 1.20 times as long as wide; basal margin substraight, sides subparallel upto anterior third, whence converging anteriorly and terminating into a subround apex; anterior margin with indistinct asperities; summit indistinct and placed slightly above the middle; anterior one-third with weak asperities and minute hairs; posterior third shiny with fine scattered granules.

Scutellum minute and triangular in shape.

Elytra 1.6 times as long as pronotum and nearly twice as long as its own width; basal margin substraight, lateral sides subparallel upto basal third, thence slightly



**Fig. 67** : *Xyleborus ferrugineus* (Fabricius), Female : a, Pronotum and elytra in dorsal view.

tapering towards rounded apex, disc occupying basal two-thirds, striae feebly impressed, punctures rather deep; interstriae about one and a half times as wide as striae, smooth and shining; punctures uniseriate, usually irregularly placed, obsolete towards base. Declivity rather steep, surface essentially flat, striae punctures usually slightly larger than those on disc; interstriae 1 and 2 flat, unarmed except a few granules at the base of declivity; interstria 3 feebly elevated, armed with a distinct tubercle at the middle of declivity, a few granules present on lateral areas, postero-lateral margins narrowly rounded with series of granules.

*Male* : Not available for study.

*Distribution* : INDIA : *West Bengal* : Calcutta. ELSEWHERE : Around the World.

*Remarks* : The species is sparsely found in India. The biological observations are mostly made on the population found in the countries other than India (Wood, 1960 and 1982, and Wood and Bright, 1992a).

**75. *Xyleborus glabratus* Eichhoff**  
(Fig. 68)

**1. *Xyleborus glabratus* Eichhoff**

1877. Eichhoff, *Dt. ent. Z.*, **21** : 127. Syntype, Female in Brussels Mus., Belgium. *Type-locality* : Japan.

1878. (1879). Eichhoff, *Mem. Soc. Roy. Sci. Liege*, **8** (2) : 381.

1894. Blandford, *Trans. Ent. Soc. Lond.*, p. 113.

1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 105.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 741.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 831, 833-834, Fig. 19 a-d.

*Description : Female* : Body cylindrical; head, pronotum and elytra reddish brown to blackish brown, but elytra comparatively darker; antennae and legs paler. Body length 2.25 mm, 3.1 times as long as wide.

Frons plano-convex, feebly elevated medially; surface finely reticulate with a few sparse shallow punctures and long erect hairs. Antennal club obliquely truncate; on anterior face, basal corneous portion with recurved acutely elevated apical margin forming a complete ring and two more sutures above it; posterior face devoid of any suture.

Pronotum 1.2 times as long as wide; basal margin substraight, lateral sides subparallel on basal two-thirds, anterior margin broadly rounded and indistinctly armed; indistinct summit much above the middle; more than anterior declivous portion with weak asperities punctures and inconspicuous hairs.

Scutellum smooth, small and somewhat triangular in shape.

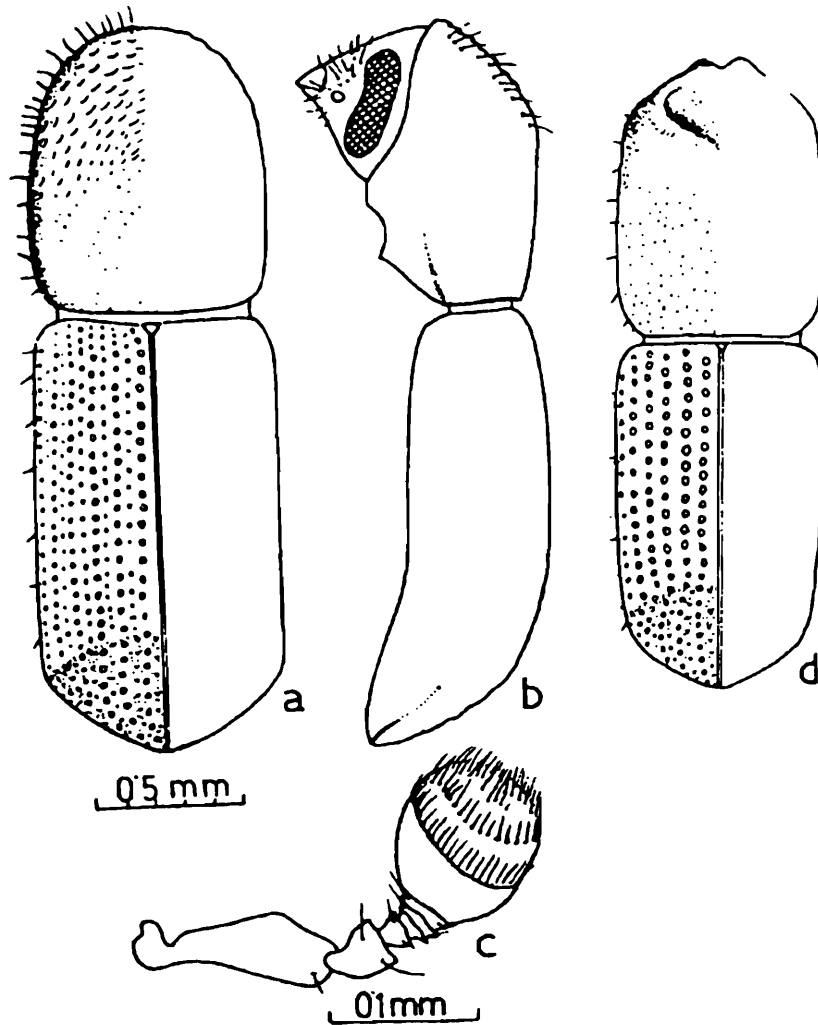
Elytra 1.5 times as long as pronotum, 1.8 times as long as its width; lateral sides subparallel upto more than basal two-thirds, thence converging posteriorly with narrowly rounded apex; discal striae not so impressed, marked by small shallow punctures, devoid of any microhair; interstriae wider than striae with uniseriate and indistinct sparse punctures and inconspicuous hairs. Declivity commencing almost on posterior third; face convex, abruptly sloping, roughened with irregular granules; postero-lateral margins distinctly carinate and confluent with interstria 7; striae 1, 2 and 3 outcurved at the middle; striae feebly impressed with comparatively close distinct punctures; interstriae with uniseriate close granules, a few on interstria 1 rather tubercle-like; hairs not visible.

*Male* : Similar to female except the following characters : Smaller in size measuring about 2.0 mm; head comparatively small, frontal surface reticulate, punctures and hairs inconspicuous; eyes and antennae reduced. Pronotum modified, weakly excavate on anterior third, anterior margin distinctly produced and terminating into bituberculate structure; excavated surface devoid of asperities rather with reticulation and indistinct punctures. Elytra as in female, but punctures and granules weak; postero-lateral carinae not well developed.

*Distribution* : INDIA : Assam : Sibsagar, Nambor Range. West Bengal : Darjiling Dist., Lopchu and Samsingh; Jalpaiguri Dist., Apalchand Range and Jalpaiguri. ELSEWHERE : Bangladesh, Taiwan and Japan.

*Hosts* : *Lindera latifolia*, *Litsaea elongata*, *Phoebe lanceolata* and *Shorea robusta*.

*Remarks* : *Xyleborus glabratus*, originally described from Japan, was recorded from India and Bangladesh by Beeson (1930). The species is closely related to *Xyleborus*



**Fig. 68 :** *Xyleborus glabratus* Eichhoff, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna. Male : d, pronotum and elytra in dorsal view.

*piceus* (Motschulsky) from which it can be distinguished by comparatively steep declivity with distinct tubercles on interstria 1. It has been recorded for the first time from *Phoebe lanceolata* in the sub-Himalayan West Bengal (Saha and Maiti, 1996), Beeson (1941) recorded three host-plants from Assam and West Bengal.

#### 76. *Xyleborus haberkorni* Eggers (Fig. 69)

##### 1. *Xyleborus haberkorni* Eggers

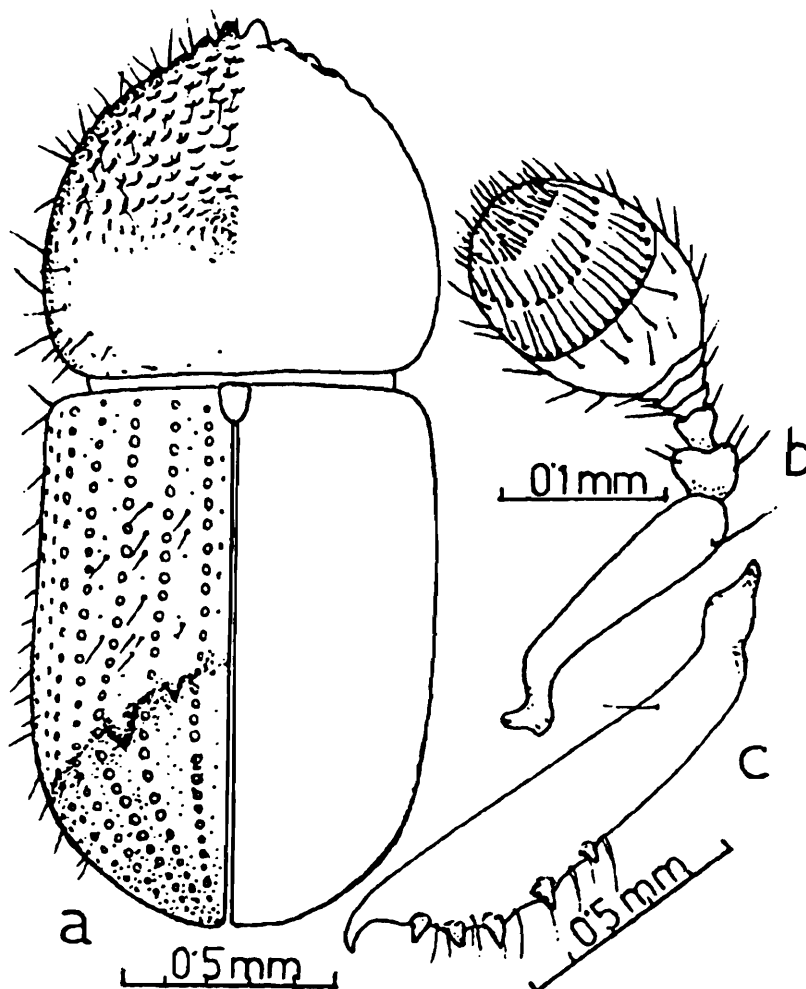
1920. Eggers, *Ent. Bl. Biol. Syst. Kafer*, **16** : 43, *Lectotype* : Female in U.S. Nat. Mus., Washington. *Type-locality* : Dutch east Africa, Amani.
1959. Schedl, *Trans. Roy. ent. Soc. Lond.* **111** : 500.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 609.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 741-742.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal Part 6 (B)* : 834.

*Description : Female* : Body short and stout; head, pronotum and elytra light brown, elytral apex comparatively darker; antennae and legs yellowish brown. Body length 2.00-2.15 mm, 2.2 times as long as wide.

Frons flatly convex and without any median line; surface reticulate with distinct punctures and sparse hairs. Eyes elongately oval and emarginate almost half of its width. Antennal scape elongate, funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved feebly costate apical margin forming a complete ring; truncated face with one distinct suture; posterior face without any suture.

Pronotum subquadrate; 1.1 times as wide as long; basal margin substraight; lateral sides subparallel upto half; anterior margin broadly rounded and with four distinct asperities, median two more prominent; distinct summit at the middle; anterior half with distinct asperities and recumbent hairs; posterior half finely reticulate with minute punctures.

Scutellum smooth, shiny and nearly tongue-shaped.



**Fig. 69** : *Xyleborus haberkorni* Eggers, Female : a, Pronotum and elytra in dorsal view; b, antenna; c, protibia.

Elytra 1.52 times as long as pronotum and 1.33 times as long as its width; lateral sides subparallel upto basal three-fourths, thence converging posteriorly with distinctly carinate postero-lateral margins and narrowly rounded apex; discal striae weakly impressed marked by distinct punctures; interstriae smooth with uniseriate punctures, nearly twice as wide as the striae. Declivity obliquely sloping with plano-convex surface and commencing almost from the middle; two large broad based tubercles on interstriae 2 and 3 at the commencement of declivity; declivital striae much impressed marked by comparatively large punctures; interstriae weakly convex, specially towards apex with a few minute granules; declivital surface without any conspicuous hair. Procoxae closely placed; protibiae with 5-6 and mesotibiae with 6-7 teeth.

*Male* : Unknown.

*Hosts* : *Eugenia jambolana*, *Mangifera indica*, *Salix tetrasperma* and *Shorea robusta*.

*Distribution* : INDIA : Assam : Cachar, halflong, Sibsagar, Nambor Reserve. Andaman Islands : North Andaman, Tamil Nadu : Nilgiri Hills, Conoor River. Uttar Pradesh : Dehra Dun. West Bengal : Darjiling Dist. : Samsingh. ELSEWHERE : Bangladesh, Malaysia, Myanmar, Sri Lanka, Vietnam, Indonesia (Java), Taiwan and Tonkin. Originally found in Tanzania, but not recorded from Africa since then.

*Remarks* : This widely distributed species is very closely related to *Xyleborus mucronatulus* Eggers, from which it can be distinguished by its larger size and pronotal anterior margin somewhat narrowly rounded accommodating four distinct asperities. The species is well known in many countries of the Oriental Region, including India. The species is recorded as a borer of only four species of host-plants (Beeson, 1930) including some unknown climbers in the Islands of Andaman and Nicobar (Maiti and Saha, 1986).

### 77. *Xyleborus major* (Stebbing)

(Fig. 70)

#### 1. *Phloeosinus major* Stebbing

1909. Stebbing, E.P. *Indian Forest Mem. Zool.*, 1 (2) : 19, Female. *Type-locality* : Goalpara, Assam, India.

#### 2. *Xyleborus major* (Stebbing)

1914. Stebbing, *Indian Forest Insects* (Coleopt.), p. 590-591.

1922. Sampson, *Ann. Mag. nat. Hist.*, 10 (9) : 152, Male.

1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 69.

1961. Browne, *Malay. Forest Rec.*, No. 22, p. 105.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 749.

### 3. *Notoxyleborus major* (Stebbing)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 100-102.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 827-828.

*Description : Female* : Body broadly cylindrical; head, pronotum and elytra blackish brown; lateral sides and posterior half of pronotum, antennae and legs comparatively paler. Body length 5.00-5.30 mm and about 2.5 times as long as wide.

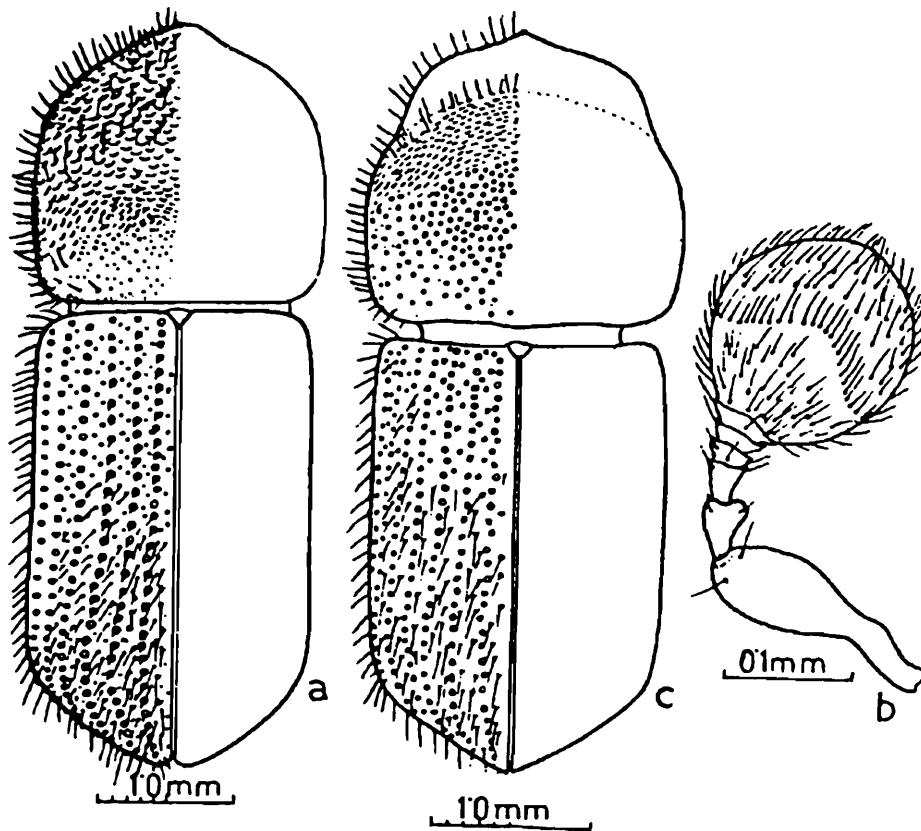
Frons plano-convex, surface smooth and shiny with small and scattered punctures, punctures towards vertex larger and becoming confluent at places, median line very short and ending to a median smooth depressed area running posteriorly devoid of any puncture and hair. Eyes large, broadly emarginate about one-third of its width. Antennal club somewhat dorso-ventrally flattered, but not truncated; on anterior face, basal corneous portion with somewhat angularly procurved, non-costate margin and posterior face with an indistinct suture apically.

Pronotum subquadrate, as long as or slightly wider than long; basal margin substraight with a weak median emargination; lateral sides subparallel upto basal two-thirds; antero-lateral corners broadly rounded and anterior margin with a weak median corners broadly rounded and anterior margin with a weak median projection accommodating 7-8 distinct asperities; dorsal summit very prominent, placed slightly below the middle and both anterior and posterior portion declivous; anterior declivous portion with long hairs and small asperities gradually increasing in size anteriorly and also weakly extending postero-laterally; area below the summit somewhat smooth and shiny with scattered fine punctures.

Scutellum smooth and shiny; comparatively small and somewhat tongue-shaped.

Elytra about 1.8 times as long as broad and 1.6 times as long as pronotum; lateral sides subparallel upto more than basal three-fourths, thence strongly converging to a narrowly rounded apex; postero-lateral sides with a acute margin set with granules; discal striae weakly impressed with large shallow punctures, sutural striae at basal region obsolete; interstriae wide, shiny and feebly convex with small punctures and inconspicuous hairs. Declivity commencing slightly below the middle with regularly convex face, somewhat depressed towards postero-lateral margins; declivital striae much impressed and marked by comparatively large punctures; sutural striae at the middle marked by double rows of punctures; striae 2 and 3 outcurved; interstriae weakly convex with irregular granules and erect hairs. Procoxae contiguous; protibiae with 8 teeth and both meso- and meta-tibiae with 9-10 teeth.

*Male* : Males are very similar to females, but differs as follows : Body length 4.60 mm; head, pronotum and elytra yellowish brown in colour. Head not visible, completely concealed under the anterior projection of pronotum; pronotum, including anterior projection slightly wider than long; lateral sides weakly outcurved, thence slightly



**Fig. 70 :** *Xyleborus major* (Stebbing), Female : a, Pronotum and elytra in dorsal view; b, antenna. Male : c, pronotum and elytra in dorsal view.

narrowing anteriorly; anterior third narrowing apically and strongly projecting anteriorly like a spoon, surface of projected anterior third roughened with blunt granules and punctures, and with weak asperities at the middle; posterior portion with punctures, gradually sparser towards basal margin. Elytra as in female, except having elytral declivity commencing much above the middle and sloping gradually.

*Distribution* : INDIA : *Andaman Islands* : Middle Andaman; *Assam* : Goalpara; *West Bengal* : Jalpaiguri Dist., Buxa, Mahabari Range, Rajabhatkhawa and Upper Tendu Range. ELSEWHERE : Myanmar and Malaysia.

*Hosts* : *Dipterocarpus turbinatus* and *Shorea robusta*.

*Remarks* : *Xyleborus major* is one of the large scolytid species represented in India. Although, this is a very well established species, but its generic status has been changed several times as evidence from the list of synonymies. The species is mostly associated with *Dipterocarpus* plants in India (Beeson, 1941).

## 78. *Xyleborus mucronatulus* Eggers (Fig. 71)

### 1. *Xyleborus mucronatulus* Eggers

1930. Eggers, *Indian Forest Rec.*, (Eng.), 14 (9) : 199, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Kalimpong, West Bengal, India.

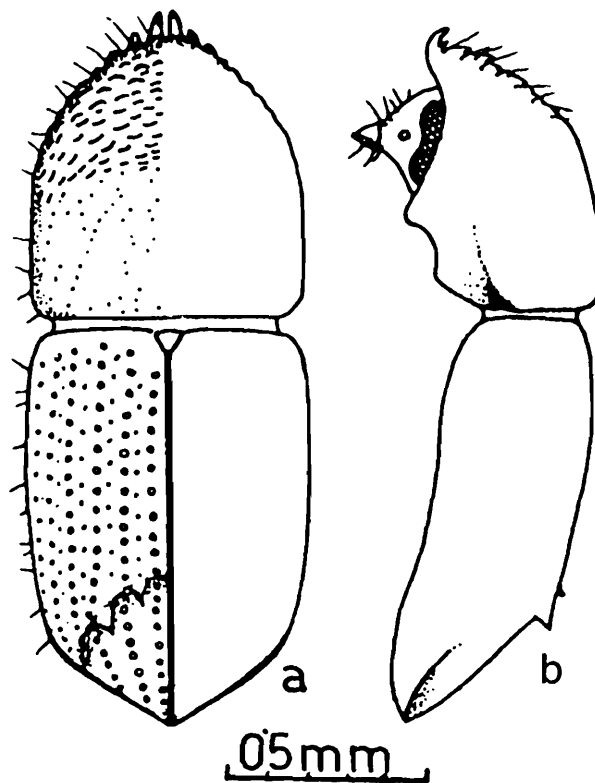
1975. Beaver and Browne, *Oriental Ins.*, 9 (3) : 299.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 753.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 831, 834.

*Description : Female* : Body fairly long and cylindrical; head, pronotum, legs and antennae yellowish brown; elytra blackish brown. Body length 1.65 mm, 2.6 times as long as wide.

Head somewhat globose; frons flat, finely reticulate with a few scattered punctures and fine hairs, without any median line. Eyes distinctly emarginate. Antennae not available for study.



**Fig. 71** : *Xyleborus mucronatulus* Eggers, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Pronotum 1.1 times as long as wide; basal margin substraight; lateral sides subparallel on basal half, thence converging anteriorly and terminating into an angular projection, armed with 6 pointed asperities, of which middle two more distinct; dorsal margin almost straight upto more than middle, strongly declivous anteriorly; declivous portion with distinct asperities in concentric rows; more than basal half smooth and shining with sparse minute punctures.

Scutellum somewhat triangular.

Elytra nearly 1.4 times as long as pronotum and 1.5 times as long as its width; basal margin substraight, lateral sides subparallel on basal three-fourths, thence

converging posteriorly into an angular apex; postero-lateral margins distinctly carinate and confluent with interstria 7; discal striae gradually impressed towards declivity, punctures small but distinct and microhairs inconspicuous; interstriae wider than striae with distinct punctures of nearly equal in size as those on striae and with inconspicuous hairs. Declivity commencing nearly from the middle; face shiny, impressed along striae 1 and 2, and slightly convex on either side; interstriae 1 and 3 with one broad based pointed tubercle at the commencement of declivity on each.

*Male* : Unknown.

*Host* : *Mesuaie ferrea*.

*Distribution* : INDIA : *West Bengal* : Kalimpong. ELSEWHERE : Indonesia (Java and Borneo), Malaysia and Thailand.

*Remarks* : This small species has so far been found only in a single locality in India (Kalimpong, West Bengal) infesting twigs of dying *Mesuaie ferrea* collected along with *Xylosandrus mesuae* (Eggers) in the month of August.

It is very close to *Xyleborus haberkorni* Eggers from which it can easily be distinguished by its smaller body size and angularly produced pronotum accommodating 4 distinct pointed asperities of which median two much larger. Its occurrence in the Siwalik hills is rather erroneous (Beeson, 1930 and 1941).

### 79. *Xyleborus perforans* (Wollaston) (Fig. 72)

#### 1. *Tomicus perforans* Wollaston

1857. Wollaston, *Cat. Madeira Coleopt.*, **96**, *Type* : Female in B.M. Nat. Hist., London and Type : Male in Nat. Hist. Mus. at South Kensington. *Type-locality* : Madeira Isl., Atlantic Ocean.

#### 2. *Xyleborus perforans* (Wollaston)

1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 108.

1960. Wood, *Insects of Micronesia*, **18** (1) : 70.

1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 63-65.

1969. Schedl, *Oriental Ins.*, **3** (1) : 54.

1975. Schedl, *Revue suisse Zool.*, **82** (3) : 457.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 759-762

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 832, 834-835.

#### 3. *Bostnichus duponti* Montrouzier

1858. Montrouzier, *Annls. Soc. Ent. Fr.*, **1** (4) : 265, *Type-locality* : New Caledonia (Deposition of types not mentioned).

#### 4. *Bostrichus testaceus* Walker

1859. Walker, *Ann. Mag. nat. Hist.*, **3** (3) : 260, *Type-locality* : Sri Lanka. Types in B.M. Nat. Hist., London.
1955. Browne, *Sarawak Mus. J.*, **6** : 355 (Synonymy).

#### 5. *Anodius tuberculatus* Motschulsky

1863. Motschulsky, *Bull. Soc. Imp. Nat. Moscon*, **36** : 511, *Type-locality* : Sri Lanka (Repository not mentioned).
1969. Wood, *Gt. Basin Nat.*, **29** : 118 (Synonymy).

#### 6. *Xyleborus kraatzi* Eichhoff

1868. Eichhoff, *Berl. ent. Z.*, **12** : 152, Female, *Type-locality* : Sri Lanka.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 108 (Synonymy).

#### 7. *Xyleborus immatures* Blackburn

1885. *Trans. R. Soc. Dublin*, **3** : 192-194, Female, *Type-locality* : Sandwich Island.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 63 (Synonymy).

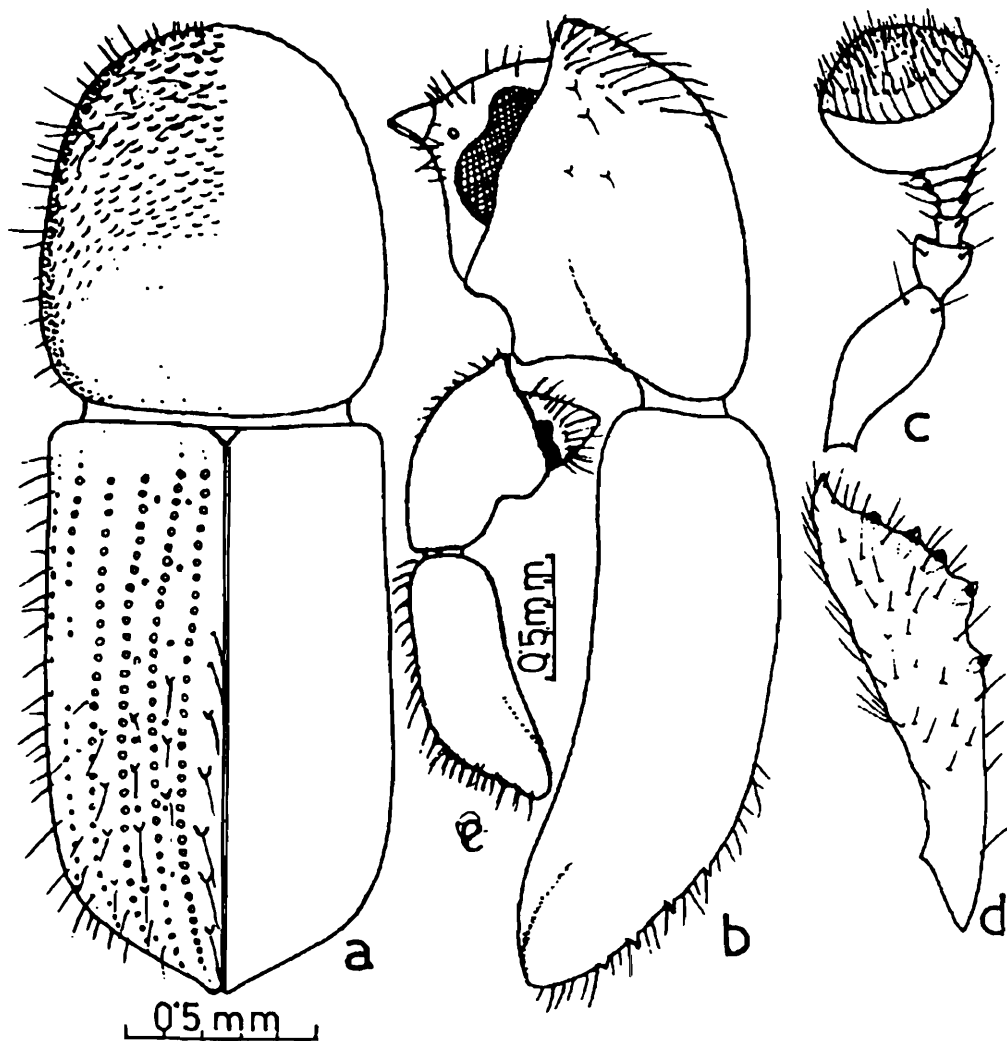
*Description* : *Female* : Body fairly long and cylindrical; head, pronotum and elytra light brown to reddish brown. Body length 2.10-2.35 mm, 2.80 times as long as wide.

Head globose; frons convex with a median weak smooth prominence; surface rugosely reticulate with sparse deep punctures and with sparse small hairs. Eyes elongately oval with more than one-third of its width emarginate. Antennal scape slender; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved feebly costate apical margin forming a complete ring being subapical on posterior face, indicating a suture; truncate face with two recurved sutures.

Pronotum 1.10 times as long as wide; basal margin substraight; lateral sides straight and subparallel on more than basal half and anterior margin broadly rounded and unarmed; summit in front of the middle; declivous portion with fine asperities; posterior half finely punctate, smooth and shiny on postero-median portion; pilosity inconspicuous.

Scutellum small and subround.

Elytra 1.70 times as long as broad and 1.5 times as long as pronotum; basal margin substraight; lateral sides almost straight and subparallel on basal two-thirds, gradually narrowing posteriorly into broadly rounded apex; discal striae not so impressed, but marked by small but deep punctures, each with a microhair, microhair sometimes inconspicuous; interstriae smooth and shining, slightly wider than striae



**Fig. 72 :** *Xyleborus perforans* (Wollaston), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna; d, protibia. Male : e, head, pronotum and elytra in lateral view.

with widely placed small punctures and long fine hairs. Declivity commencing on apical third, face steep and convex; declivital striae as on disc; interstriae 1 and 3 each with two or three pointed tubercles along with 2-3 smaller ones towards declivital base, interstria 2 unarmed but a few granules at base, interstriae 4, 5 and 6 usually with 1-3 rather small tubercles on upper half of declivity; all interstriae with some long erect hairs.

*Male* : Body reduced, length 1.80-2.10 mm, 2.35 times as long as wide. Head concealed under pronotum.

Pronotum almost as long as wide, subsquarish, basal margin substraight; lateral margins subparallel except the anterior margin which are moderately round medially angularly produced; antero-dorsal declivity sharp and rugose, weak asperities present near the apical margin, while distinct one present middorsally, a semi-circular whorl of setae present at the middle.

Elytra 1.4 times as long as and as wide as pronotum; lateral sides subparallel, posterior declivity moderate, a few tubercles present on it; six well defined striae present on each elytron, interstitial hair scarce.

*Distribution* : The species occurs throughout the tropical and subtropical areas of the World including India, and the Andaman and Nicobar Islands (For details in Beeson, 1930 and Maiti and Saha, 1986 and Wood and Bright, 1992).

*Host* : The species infests about eight species of host-plants including Climbers, seeds of Mangrove plants, etc. in India and its neighbouring countries including the Bay Island (Beeson, 1930 and 1941; Maiti and Saha, 1986; Saha and Maiti, 1996).

*Remarks* : *Xyleborus perforans* is one of the old species of scolytids described as early as 1857, by Wollaston as *Tomicus perforans* from an island in the Atlantic Ocean. More than half a dozen of species are now synonymised under it and as such, it is a very variable and widely distributed species in the tropics and subtropics. In India, it was previously known in the name of *X. kraatzi* (Beeson, 1930) and later on in the name of *X. testaceus* Walker (Beeson, 1941). Although the validity of *X. kraatzi* was ignored by Hagedorn (1910), but Beeson (1929 and 1930) continued to treat it as a distinct species as suggested by Eggers that the true *kraatzi* from Sri Lanka was "one of a group of very closely allied species" Ultimately, both *X. kraatzi* and *X. testaceus* were submerged under the species *X. perforans*.

It is a very common species found in India including in the Andaman and Nicobar Islands, infesting numerous felled logs, climbers, seeds of mangrove plants (Beeson, 1930; Maiti and Saha, 1986). The galleries are oriented according to host size with some regularity in extension of galleries to the horizontal planes of the entrance tunnels from which branches are sent of both the sides of mother gallery. Adult emergence takes places throughout the year with their maximum abundance mostly in winter months in north India (Beeson, 1941). It hardly attacks the live trees unless those are almost in dying condition.

## 80. *Xyleborus pumilus* Eggers (Fig. 73)

### 1. *Xyleborus pumilus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 209, *Holotype* : Female in U.S. Nat. Mus., Washington, *Type-locality* : Sumatra, Indonesia.
1927. Eggers, *Treubia*, **9** : 407.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 67.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 612.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 767.

## 2. *Coptoborus pumilus* (Eggers)

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 79-81.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 810-811.

*Description : Female* : Body fairly long and cylindrical; head pale yellow to brown, pronotum comparatively darker, elytra yellowish brown to completely black. Body length 1.90-2.00 mm, 3 times as long as wide.

Frons plano-convex, feebly elevated medially, but without any distinct median line; surface finely reticulate with a few deep and shallow punctures and long erect hairs. Eyes elongate, one-third of its width emarginate. Antennal club obliquely truncate; on anterior face, basal corneous portion with substraight apical margin, truncated face marked by two sutures, basal one more distinct; posterior face with one suture apically.

Pronotum 1.20 times as long as wide; lateral sides subparallel upto more than basal two-thirds; anterior margin broadly rounded and unarmed; summit indistinct, placed just above the middle; anterior one-third with weak asperities and long erect hairs, a few minute asperities extending postero-laterally below the summit; nearly posterior two-thirds smooth and shiny with sparse fine punctures and some inconspicuous hairs.

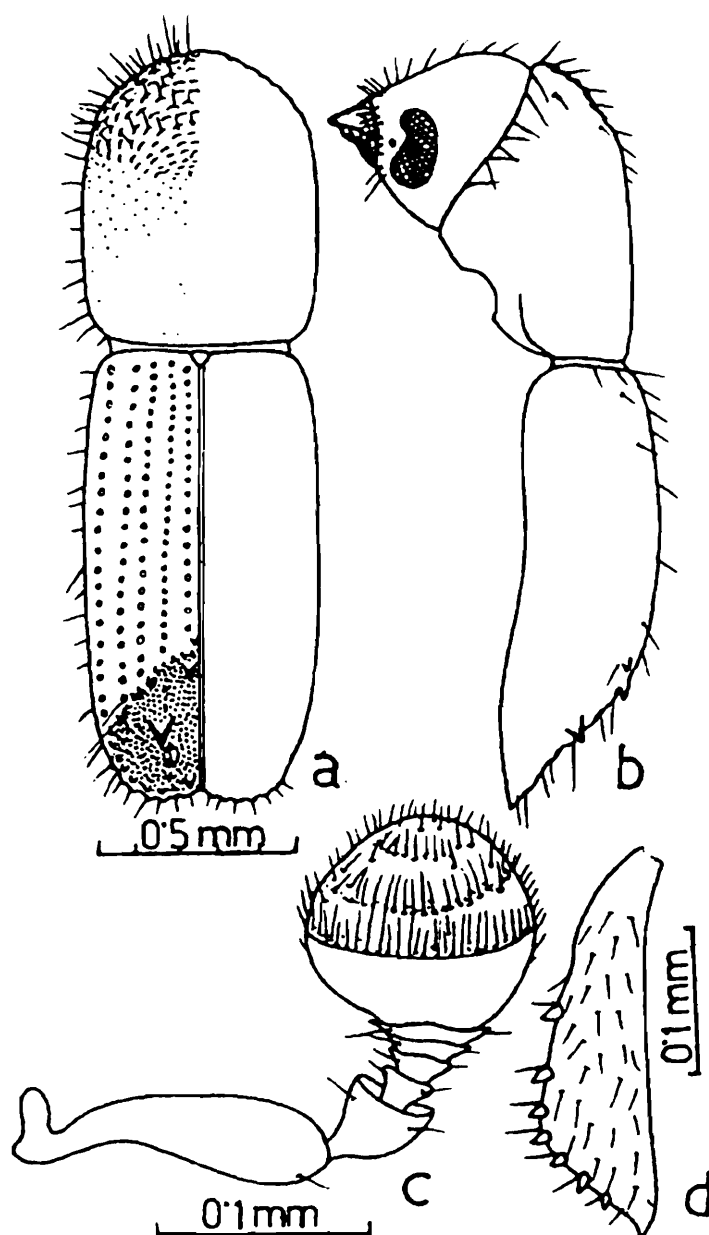
Scutellum small, shiny and rounded apically.

Elytra about 1.50 times as long as and as wide as pronotum, 1.8 times as long as its own width; lateral sides almost straight and subparallel upto slightly more than basal two-thirds, whence weakly narrowing posteriorly and terminating into an individually rounded elytral apex; discal striae feebly impressed with small shallow punctures; interstriae much wider than striae with small punctures and with a few hairs. Declivity commencing at almost posterior third, face weakly excavate, smooth and shiny, without any distinct striae or interstriae, except a few punctures in longitudinal rows visible below the tubercles indicating stria 2; one large tubercle slightly above the middle of declivity at the level of interstria 2; a few erect hairs along the margin of declivity; Procoxae contiguous, pro- and meso-tibiae with 7 and 9 teeth respectively.

*Male* : Unknown.

*Distribution* : INDIA : *Andaman Islands* : North, Middle and Little Andaman; *Assam* : Cachar, Halflong; Lakhimpur, Upper Dihing Reserve; *West Bengal* : Darjiling Dist., Sukna. ELSEWHERE : Myanmar, Sri Lanka, Philippines, Indonesia, Laos, Malaysia, Vietnam, New Guina and Solomen Isl.

*Hosts* : *Artocarpus chaplasha*, *A. lakoocha*, *Hymenodictyon excelsum*, *Ficus infectoria*, *Sterculia campanulata*, *S. villosa*, *Terminalia bialata*, *T manii* and *Dipterocarpus* sp.



**Fig. 73 :** *Xyleborus pumilus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna; d, protibia.

*Remarks :* *Xyleborus pumilus* is predominantly an insular species, although it is not uncommon in the mainlands of the Oriental Region, from the eastern India (Assam) to Solomon Island in the Pacific. It is fairly well distributed in the islands of Andaman and recorded from a number of hosts (Maiti and Saha, 1986). The species can easily be separated from the allied one *C. shorea* Stebbing by its smaller size and individually rounded each elytral apex, but lacking prominent emargination. Biological notes restrict to the record of host plants and gallery pattern. The species has strong preference to Moraceae in Malaya and construct both radial and circumferential galleries generally terminating into broad chambers (Beeson, 1930, 1941 and Browne, 1961).

81. *Xyleborus shiva* Maiti and Saha  
(Fig. 74)

1. *Xyleborus shiva* Maiti and Saha

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 140-142, *Holotype* : Female in Z.S.I., Calcutta, *Type-locality* : Little Andaman, India.

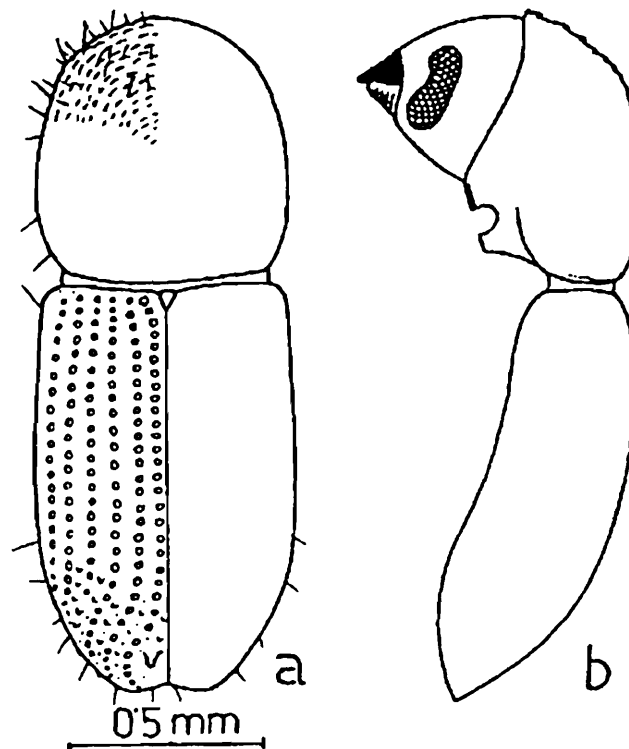
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 772.

*Description* : *Female* : Body long and slender, head and anterior part of pronotum blackish brown, elytra deep brown. Body length 1.85mm.

Head globose, fairly narrowing anteriorly; frons weakly convex, surface reticulate, devoid of any median line. Eyes elongately oval, nearly half of its width divided by emargination. Antennal club obliquely truncate; segment 1 corneous on anterior face, basal corneous portion reaching upto middle and with weakly procurved apical margin, truncated face with one distinct sutural line marked by hairs; posterior face with one suture apically.

Scutellum small and subrounded.

Pronotum subquadrate, 1.1 times as long as broad; basal margin straight; lateral margins weakly outcurved; anterior margin broadly rounded and provided with few weak transverse asperities; indistinct summit placed almost at the middle; anterior declivous portion with transverse weak asperities in concentric rows, gradually



**Fig. 74** : *Xyleborus shiva* Maiti and Saha, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

increasing in size anteriorly, a few small asperities extending on either side of summit; posterior half laterally smooth and shiny, punctures rather indistinct and devoid of any hair.

Elytra 1.6 times as long as and almost as wide as pronotum, 1.8 times as long as its width; basal margin straight, lateral sides subparallel, gradually narrowing posteriorly and individual elytra somewhat subround apically; postero-lateral margins acute but not distinctly carinate; discal striae somewhat impressed but with small shallow punctures; interstriae smooth, plano-convex, wider than striae, but devoid of distinct punctures and hairs. Declivity commencing on posterior third with medially convex and laterally depressed face, declivital striae well marked by large but shallow punctures devoid of any microhair, striae 1, 2 and 3 outcurved at the middle; interstriae with a few sparse granules of different sizes; interstria 1, somewhat raised below the middle accommodating 1 distinct setiferous tubercle, interstriae 2 and 3 depressed towards apex; a few sparse hairs along the elytral margins.

*Male* : Unknown.

*Distribution* : INDIA : *Andaman Islands* : Little Andaman Isl. (Type-locality).  
ELSEWHERE : None.

*Host* : *Pterocymbium tinctorium*.

*Remarks* : The species is only so far known from its type-locality (Little Andaman) infesting sapwood of *Pterocymbium tinctorium*. It is a very close species to *X. bicolor*.

## 82. *Xyleborus shoreae* (Stebbing) (Fig. 75)

### 1. *Tomicus shoreae* Stebbing

1907. Stebbing, *Indian Forest Bull.*, 11 : 39, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Goalpara, Assam, India.  
1909. Stebbing, *Indian Forest Mem. Zool.*, 1 (2) : 16.

### 2. *Xyleborus shoreae* (Stebbing)

1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 258-259.  
1977. Kumar and Chandra, *Oriental Ins.*, 11 (1) : 36, Male.  
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 772.

### 3. *Coptoborus shoreae* (Stebbing)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part, 6 (B) : 811.

### 4. *Tomicus* sp. Stebbing

1907. Stebbing, *Indian Forest Bull.*, 11 : 39.  
1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 83 (Synonymy).

### 5. *Tomicus assamensis* Stebbing

1908. *Indian Forest Mem., Zool.* 1 (2) : 17, *Type-locality* : Assam, India.

1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 83 (Synonymy).

### 6. *Xyleborus fallax* Stebbing (nec. Eichhoff)

1914. Stebbing, *Indian Forest Insects (Coleopt.)*, p. 582.

1924. Beeson, *Proc. 5th Ent. Meet. Pusa*, p. 164.

1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 83 (Synonymy).

*Description : Female* : Body long and cylindrical; colour light brown to chestnut brown. Body length 3.00-3.15 mm, 3.1 times as long as wide.

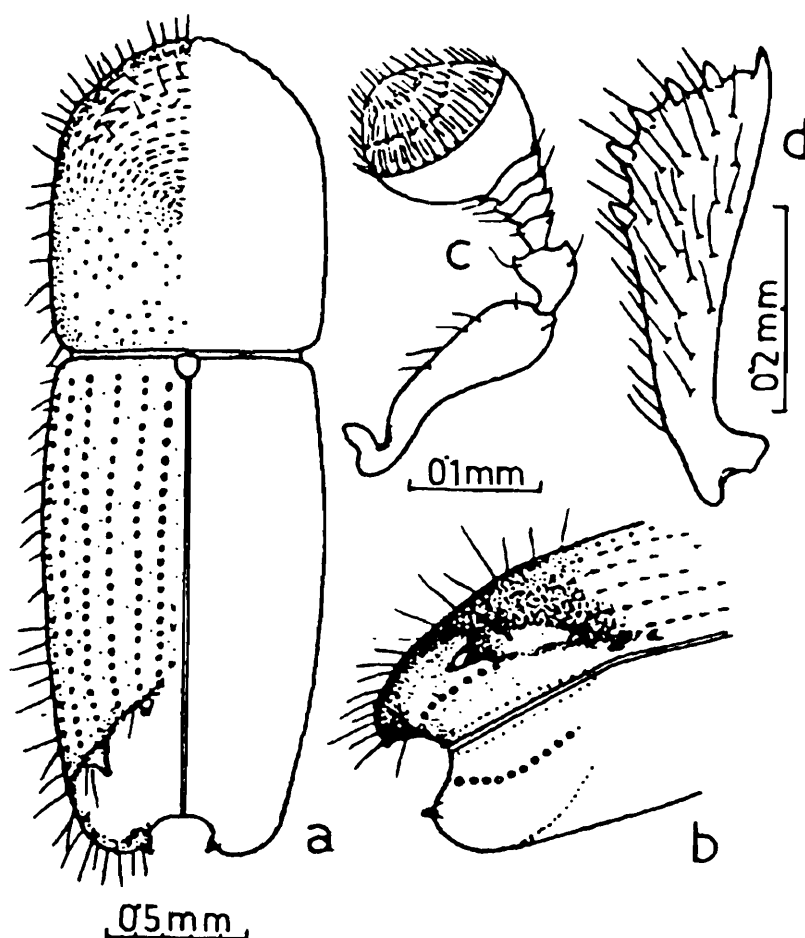
Frons plano convex, with a median broad and elevated line; surface finely reticulate with shallow punctures, denser towards epistomal margin and having fine hairs except on median smooth portion. Antennal club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin; truncated face marked by two sutures, basal one distinct; posterior face with one suture apically.

Pronotum 1.20-1.25 times as long as broad; sides subparallel upto basal two-thirds, anterior margin broadly rounded and unarmed; summit indistinct, placed just above the middle; anterior half with small asperities; posterior half shiny with close distinct punctures, except smooth median strip; long hairs restricted on anterior half and laterally.

Scutellum tongue-shaped.

Elytra 1.56-1.58 times as long as pronotum and 1.9 times as long as its width; lateral sides subparallel on basal two-thirds, thence gradually rounded posteriorly and each elytron separately rounded apically along with a feeble emargination, discal striae marked by minute shallow punctures, devoid of any hair; interstriae nearly thrice as wide as striae, smooth with sparse shallow punctures and with a few long erect hairs. Declivity commencing slightly below the middle, face moderately excavate with smooth and shiny surface, with a few scattered minute punctures, but devoid of any hair and weakly elevated along sutural line; stria 1 indistinctly marked by some irregular minute punctures, only one stria conspicuous and marked by deep small punctures and outcurved at the middle; entire declivital margin provided with small and blunt tubercles, interstriae 2 and 4 each with comparatively large tubercles, later being largest and both placed little inside the declivity.

*Male* : Similar to female, except smaller in size, body length 2.1 mm; frontal surface reticulate with inconspicuous punctures, but with sparse long hairs; eyes reduced. Pronotum feebly convex, devoid of any distinct summit, anterior half with large distinct punctures and with a few granulate asperities; posterior half with minute sparse punctures. Elytra more or less as in female.



**Fig. 75** : *Xyleborus shoreae* (Stebbing), Female : a, Pronotum and elytra in dorsal view; b, elytral declivity in dorsal view; c, antenna; d, protibia.

*Distribution* : INDIA : Assam : Goalpara; Sibsagar, Nambor Reserve, Central Range; Lakhimpur, Upper Dihing Reserve, Mokum Range, Margherita. Uttar Pradesh : Dehra Dun Div., Siwalik; Lansdowne, Nauri (850 m); Kalagarh, Adnala Range; Gorakhpur. West Bengal : Jalpaiguri Dist., Buxa, Jalpaiguri, Duars and Apalchand range, Darjiling Dist., : Lopchu, Kurseong, Tista valley and Samsingh. ELSEWHERE : Myanmar.

*Hosts* : *Amoora wallichii*, *Anthocephalus cadamba*, *Castanopsis* sp. *Dipterocarpus pilosus*, *Echinocarpus dasycarpus*, *Ehretia acuminata*, *Lannea grandis*, *Mallotus philippinensis*, *Odina wodier*, *Phoebe lanceolata*, *Sapium eugeniaefolium*, *Schima wallichii*, *Shorea assamica*, *S. robusta*, *Terminalia chebula*, *T. myriocarpa*, *T. tomentosa*, *Vatica laneeaeifolia* and *Zanthoxylum budrunga*. (Beeson, 1930 and 1941; Saha and Maiti 1996).

*Remarks* : The species, *Xyleborus shoreae* was originally described as *Tomicus shorea* and subsequently had been transferred to some other genera to be finally placed under *Xyleborus*. The species is so close to *X. fallax* that some material from the Duars, north Bengal have been named as this species by Stebbing (1941). It is a well known Indian species associated with many hosts-plants in the country.

**83. *Xyleborus similis* Ferrari**  
(Fig. 76)

**1. *Bostrichus ferrugineus* Boheman**

1851- 1853. Boheman, *Voyage de Kongliga Svenska Fregatten Eugenie Resa*, Zool., 1, 1858-1859, p. 88, *Types* : Stockholm Museum.

**2. *Xyleborus similis* Ferrari**

1867. Ferrari, *Die Forst-und Baumzuchtschadlichen Borkenkafer*, pp. 23-24, Female. *Type-locality* : Keeling Island.

1924. Schedl, *Tijdschr. Ent.*, 85 : 47, Male, Java.

1962. Schedl, *Rev. Ent. Moc.*, 5 (1) : 459-471 (detailed synonymies, host-plants, distribution, etc.).

1975. Schedl, *Revue suisse Zool.*, 83 (3) : 452.

1984. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 137-140.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 772-774.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 832, 835.

**3. *Anodius denticulus* Motschulsky**

1863. Motschulsky, *Bull. Soc. Imp. Nat. Moscou.*, 36 (2) : 512, Female.

1962. Schedl, *Rev. Ent. Moc.*, 5 (1) : 459.

**4. *Xyleborus parvulus* Eichhoff**

1868. Eichhoff, *Berl. ent. Ztg.*, 12 : 152, Female. *Type-locality* : Sri Lanka.

**5. *Xyleborus submarginatus* Blandford**

1896. Blandford, *Trans. ent. Soc. Lond.*, pp. 223-224, Female, *Type-localities* : India; Indonesia (Celebes); New Guinea and Sri Lanka.

**6. *Xyleborus bucco* Schaufuss**

1897. Schaufuss, *Tijdschr. Ent.*, 40 : 212-214, *Type-locality* : La Digue, Seychelles.

**7. *Xyleborus capito* Schaufuss**

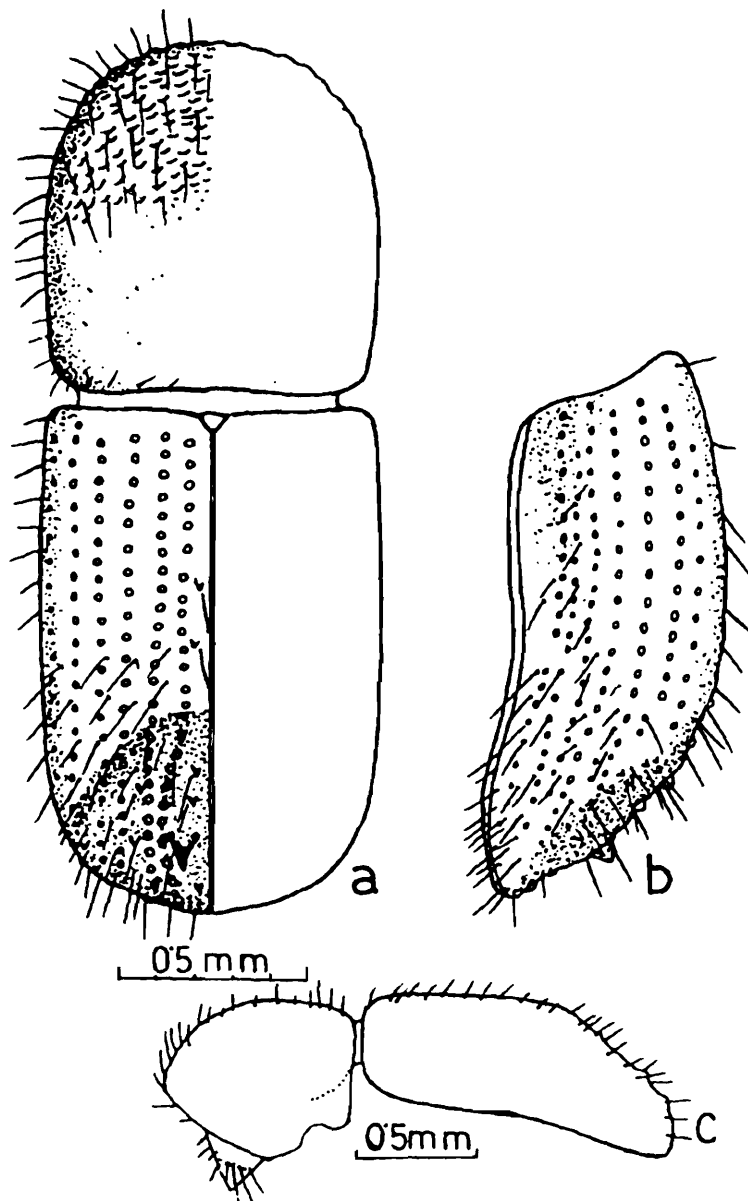
1897. Schaufuss, *Tijdschr. Ent.*, 40 : 215, Male, *Type-locality* : Philippine.

*Description* : *Female* : Body somewhat stout and cylindrical; head, pronotum and elytra reddish brown; antennae and legs slightly paler. Body length 2.30-2.45 mm, 2.70 times as long as wide.

Frons convex, surface finely reticulate and punctate, usually with an indistinct prominence between the eyes; vestiture inconspicuous. Eyes suboval and more than

one-third width divided by an emargination. Antennal scape slender; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion extending upto middle with recurved acutely elevated apical margin forming a complete ring being subapical and indicating a suture on posterior face; truncate face with 2 sutural lines marked by hairs.

Pronotum subquadrate, 1.10 times as long as wide; lateral sides straight and subparallel on more than basal half; anterior margin very broadly rounded and unarmed; summit almost at the middle; anterior declivous portion pilose and with fine asperities, a few weak ones extending postero-laterally; posterior half smooth and shiny with minute punctures, rather obscurely reticulate at sides and vestiture inconspicuous.



**Fig. 76** : *Xyleborus similis* Ferrari, Female : a, Pronotum and elytra in dorsal view; b, single elytron in lateral view. Male : c, head, pronotum and elytra in lateral view.

Scutellum smooth, shiny and subround.

Elytra 1.30-1.60 times as long as wide, and 1.30-1.50 times as long as pronotum, basal margin somewhat truncate; lateral sides straight and subparallel on basal two-thirds and broadly rounded at apex; discal striae not so impressed marked by small and moderately deep punctures; interstriae somewhat smooth and shiny, wider than striae with small, irregular and deep punctures. Declivity steep and flattened with a pair of very prominent tubercles on interstria 1 just below the centre of declivity; postero-lateral margins acutely elevated from apex upto interstria 7; sutural stria diverging distinctly from suture accommodating large tubercles on interstria 1; striae 2 and 3 also somewhat diverging; interstria 1 with a few small tubercles near declivital base and another small one near apex; interstriae 2-5 normally with 1-3 similar minute tubercles on upper half of declivity; interstriae with long erect hairs becoming more coarse on declivity. Procoxae contiguous; protibiae with 7 and both meso- and meta-tibiae each with 8 teeth.

*Male* : Body yellowish brown, elytra much darker and shining. Head concealed under the pronotum. Pronotum almost subquadrate, basal margin substraight; lateral sides subparallel in basal half, antero-lateral angles moderately rounded with a distinct apex; well marked declivity present dorsally in the anterior half.

Elytra 1.30 times as long as and as wide as pronotum; basal margin substraight; lateral sides subparallel upto the basal two-thirds, moderately round at apex; posterior declivity moderately pilose; four prominent tubercles present on the declivity on each elytron; six rows of feeble striae present, few setae present in interstitial space.

*Distribution* : The species is very common in India including in the territory of Oriental, Australian and Ethiopian regions.

*Hosts* : The species is so far known to attack more than fifty host-plants in India and its neighbouring countries (Beeson, 1930 and 1941).

*Remarks* : *Xyleborus similis*, a very variable and widely distributed species, is well represented in India. It is a common and well known pine-hole borer of dead, dying and felled trees, etc., in the tropics. The wide range of variation of its declivital tubercle on each elytron specially in its shape, size and position, has created lots of confusion in the past leading to the erection of a number of new species from different territories within its distribution limit. Subsequently, detailed study has also resulted into synonymy of a number of species under it, as evidence from its long synonymy list.

The biology of the Indian population has been studied by Beeson (1930) as *Xyleborus submarginatus* Blandford, indicating the shortest period of maturation of brood upto three months to longest period of 23 months. In addition to few more biological data, the author had also recorded as many as 42 host-plants from India. Recently, Maiti and Saha (1986) had reported the species from eleven host-plants from the Andaman and Nicobar Islands. However, the species is also known to infest number of host-plants in Malaya also (Browne, 1961).

Genus *Xylosandrus* Reitter1. *Xylosandrus* Reitter

1913. Reitter, *Wien. ent. Ztg.*, **32** (2) : 80 and 83.  
 1962. Schedl, *Rev. Ent. Moc.*, **5** (1) : 103.  
 1963. Browne, *Ent. Ber.*, **23** : 54-55.  
 1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 77.  
 1980. Wood, *Gt. Basin Nat.*, **40** (1) : 96.  
 1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 145.  
 1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A)  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 836.

2. *Apoxyleborus* Wood

1980. Wood, *Gt. Basin Nat.*, **40** (1) : 90.  
 1985. Beaver and Loytyniemi, *Revue Zool. afr.*, **99** : 69.  
 1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 808.

*Type of genus* : *Xylosandrus* : *Xyleborus morigerus* (Blandford); *Apoxyleborus* : *Xyleborus mancus* (Blandford).

Reitter (1913) proposed the genus *Xylosandrus* based on the characteristics of *Xyleborus morigerus* described by Blandford in 1894 from New Guinea. The genus with its distinctive characters of widely separated procoxae, was remained valid until 1962, when Schedl considered it as a synonym of the genus *Xyleborus* along with some other genera of the tribe Xyleborini. Browne (1963) revived its generic status mainly on the basis of widely separated procoxae. Recently, Wood further substantiates its validity indicating that the procoxae moderately to broadly separated in addition to certain other characters, such as antennal club with large basal corneous portion, protibiae with 4-6 socketed teeth and pronotum armed with anterior asperities and with rounded lateral margins (pers. com.).

Based on these characters, Saha, *et al.* (1992) recognised eight species including one new species from West Bengal. However, 17 species have been assigned to this genus from India, of which three species, namely, *X. ferinus* (Schedl), *X. compactus* (Eichhoff) and *X. metagermanus* (Schedl) are not included here owing to non-availability of material.

**General characters of *Xylosandrus* Reitter.**

*Description : Female* : Body short and stout; colour varies from yellowish brown to completely black, either uniform throughout or elytra comparatively darker than head and pronotum. Body length 1.90-5.50 mm, 1.7-2.2 times as long as wide.

Head globose, frons feebly convex (*X. gravidus*) or plano-convex, with or without any median line; surface finely reticulate with either shallow or deep, close or sparse punctures, sometimes coarsely granulate (*X. crassiusculus*), sometimes with carinae converging towards epistomal margin; vestiture of long sparse hairs. Eyes elongately oval, either feebly emarginate (*X. mesuae*) or broadly emarginate more or less half of its width. Antennal scape short and stout; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring at the apex; truncated face with one or two recurved sutures; posterior face devoid of any suture.

Pronotum generally globose or subglobose, 1.1-1.3 times wider than long, basal margin substraight, but sometimes with broad emargination (*X. gravidus*); lateral sides feebly outcurved; anterior margin distinctly rounded and armed with 5-9 asperities of variable size of which two at the middle largest and others gradually becoming smaller posteriorly, summit generally at the middle, sometimes on basal third, (*X. besoni*, *X. crassiusculus* and *X. discolor*) and not very distinct; anterior half with large pointed or adpeast asperities and posterior half with minute, sparse punctures, sometimes entire surface with asperities (*X. besoni* and allied species), hairs either small or long, but postero-median portion with few hairs or with a patch of hairs in some species except *X. mesuae* and *X. ursulus*.

Scutellum triangular or subtriangular (tongue-shaped).

Elytra 1.10-1.50 times as long as pronotum, but more or less of equal size upto elytral truncated margins (*X. besoni* and allied species); basal margin substraight, but feebly outcurved (*X. gravidus*), lateral sides generally subparallel upto basal half or two-thirds, but sometimes feebly outcurved (*X. gravidus*, *X. ursinus*) and thence gradually converging posteriorly terminating into narrowly to broadly rounded apices; discal striae with uniseriate row of shallow or deep punctures either small or large; microhairs sometimes present; interstriae 3-4 times wider than striae with uniseriate or multiseriate (*X. gravidus*, *X. ursulus* and allied species) punctures; declivital face either shiny or opaque, convex or plano-convex generally commencing from middle to posterior half, but in some species (*X. besoni*, *X. crassiusculus*, *X. discolor*, *X. gravidus*, *X. jaintianus*, *X. mancus* and *X. terminatus*) declivital face generally abruptly truncate with circumdeclivital margin not acute or lower half with well marked carinae, upper half devoid of any carina; in other species with carinate postero-lateral margins, except (*X. butamali* and *X. ursulus*) where it is with granules or tubercles; generally declivital striae with punctures, larger than on disc and interstriae with uniseriate or multiseriate, either with punctures or granules, but in some species (*X. besoni* and allied species) striae punctures replaced by close granules and interstriae also with granules.

Procoxae generally widely separated; in case of larger species (those are above 3.00 mm) procoxae generally subcontiguous; protibiae with 4-7 and meso- and meta-tibiae with 6-12 teeth respectively.

**Key to the species of *Xylosandrus* Reitter based on females :**

1. Elytral apex abruptly truncate with an abrupt circumdeclivital costa (costa not acute at least on upper margin); elytral disc with confused punctures ..... 2
  - Elytral apex not truncate, rather gradually or abruptly sloping without any circumdeclivital costa (except *X. gravidus* and *X. mutilatus*, where partial circumdeclivital costa extending upto interstria 7) ..... 4
2. Declivital striae and interstriae marked by close distinct punctures throughout and surface set with inconspicuous hairs; pronotum on its posterior portion shiny and with close distinct punctures; body length 3.00 mm .... *A. mancus* (Blandford)
  - Declivital striae and interstriae marked by uniseriate close granules and surface set with dense coat of fine hairs; pronotum on its posterior portion without any punctures, rather with granules ..... 3
3. Smaller species, body length 2.60-2.70 mm; sutural interstria 1 on declivital face not raised; declivital face vertically truncate and surface set with dense coat of bifurcated hairs; circumdeclivital costa devoid of any erect hairs ..... *A. subsimilis* (Eggers)
  - Larger species, body length 3.00 mm; sutural interstria 1 on declivital face raised; declivital face not vertical rather obliquely truncate and surface set with dense coat of long and bent hairs; circumdeclivital costa with a few sparse erect hairs ..... *A. jaintianus* (Schedl)
4. Procoxae widely separated, smaller species, body length upto 3.00 mm ..... 5
  - Procoxae subcontiguous, larger species, body-length more than 4.00 mm ..... 11
5. Striae and interstriae on declivital face with granules and fine hairs, but devoid of any puncture ..... 6
  - Striae on declivital face marked with distinct punctures and that of interstriae either with punctures or granules, each with a hair ..... 8
6. Declivital face uniformly convex and gradually sloping, entire surface with confused granules; posterior one-third of pronotum shiny, punctate and with dense hairs, but devoid of tuft of hairs; body length 2.20 mm ..... *X. crassiusculus* (Motschulsky)
  - Declivital face steep and abruptly sloping, only interstitial granules confused, but strial granules in row, rather close and large; posterior one-third of pronotum not shiny rather granulate, and with sparse hairs along with a median tuft of yellowish hairs ..... 7
7. Declivital face strictly convex; declivital interstriae with single row of small hairs along with dense microhairs; discal striae of elytra feebly impressed marked by large punctures; smaller species, body length 2.30-2.40 ... *X. discolor* (Blandford)

- Declivital face plano-convex; declivital interstriae with single row of long fine hairs along with dense coat of pubescence; discal striae of elytra not impressed, only marked by shallow small punctures; larger species, body length 2.80-2.90 mm ..... *X. beelsoni* Saha, Maiti and Chakraborti
- 8. Elytral disc regularly arched; declivital face distinctly convex, body length 1.60-1.70 mm (elytral disc looking like tortoise-back) ..... *X. morigerus* (Blandford)
- Elytral disc not so regularly arched rather somewhat plano-convex; declivital face weakly convex ..... 9
- 9. Circumdeclivital margin of both lower and upper half well defined, lower half with well marked carinae; declivity somewhat abruptly fallen from the commencement; elytral disc distinctly convex; body length 1.96-2.00 mm .....  
..... *X. terminatus* (Eggers)
- Circumdeclivital margin of upper half not at all well defined, lower half with weak carinae, declivity gradually swollen from the commencement; elytral disc weakly convex ..... 10
- 10. Declivital interstriae with uniseriate thick and short whitish hair; smaller species, body length 1.45 mm ..... *X. mesuae* (Eggers)
- Declivital interstriae with long fine hairs; larger species, body length, 2.00-2.15 mm ..... *X. difficilis* (Eggers)
- 11. Declivital steep; postero-lateral margins of declivity with distinct carinae and extending upto interstria 7 ..... 12
- Declivity not steep, but gradually sloping; postero-lateral margins of declivity without any carina, rather round with either small or large granules ..... 13
- 12. Posterior portion of pronotum with comparatively large and dense punctures; scutellum nearly as long as broad; declivital interstriae without any long erect hairs; body length 4.80 mm ..... *X. mutilatus* (Blandford)
- Posterior portion of pronotum with minute, sparse punctures; scutellum distinctly broader than long; declivital interstriae with a few sparse long erect hairs; body length 4.80 mm ..... *X. gravidus* (Blandford)
- 13. Larger species, body length 5.30-5.50 mm; postero-lateral margins of declivity with distinct small granules; posterior portion of pronotum with minute punctures ..... *X. butamali* (Beeson)
- Smaller species, body length 4.25-4.60 mm; postero-lateral margins of declivity with close, either small or large granules; posterior portion of pronotum with large close punctures ..... *X. ursulus* (Eggers)

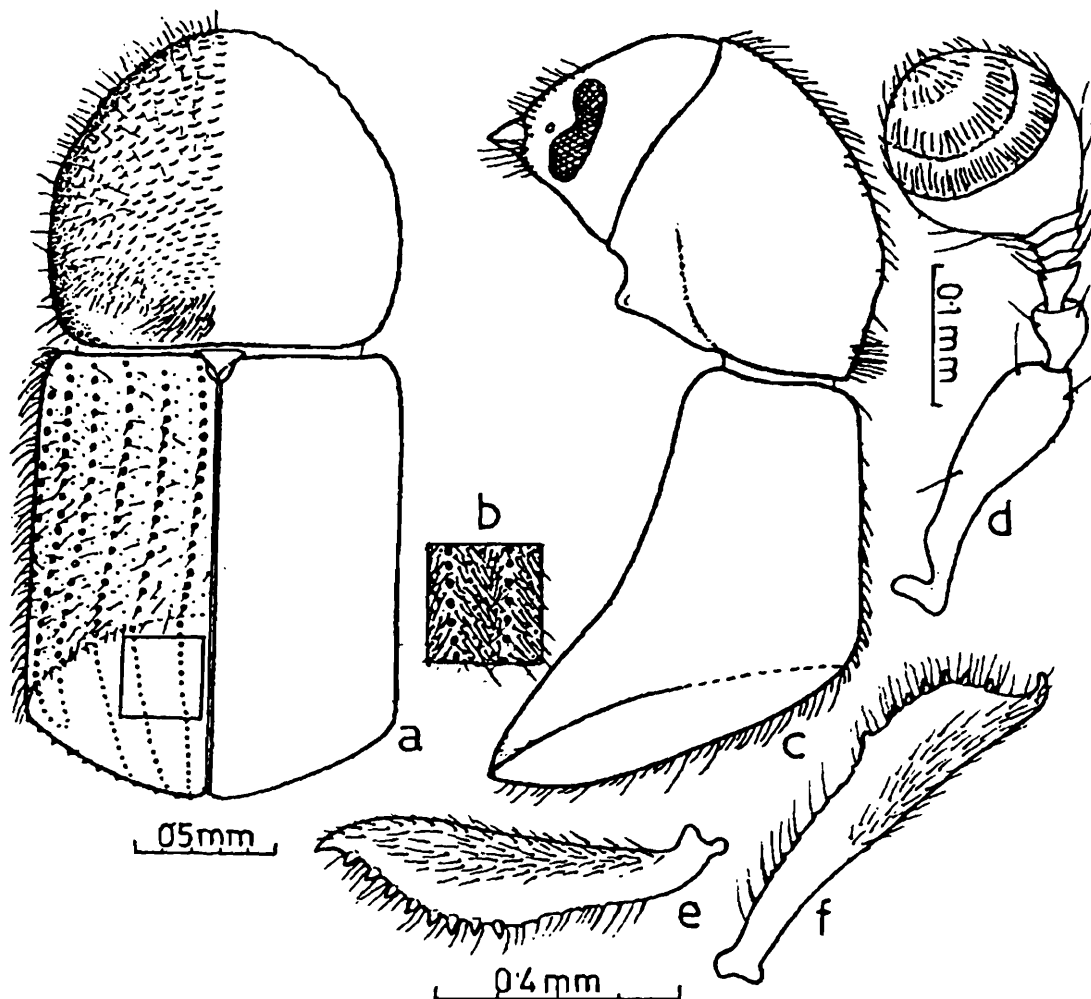
84. *Xylosandrus beelsoni* Saha, Maiti and Chakraborti  
(Fig. 77)

1. *Xylosandrus beelsoni* Saha, Maiti and Chakraborti

1992. Saha, Maiti and Chakraborti, *Rec. zool. Surv. India*, **91** (1) : 11-13. *Holotype* : Female deposited in Z.S.I., Calcutta. *Type-locality* : Rangirum, Darjiling Dist., West Bengal.

*Description : Female* : Body short and stout; head and pronotum yellowish brown in colour, elytra slightly darker. Body length 2.80-2.90 mm, twice as long as wide.

Frons plano-convex with a feeble median line; surface finely reticulate with a few shallow punctures towards vertex and a few distinct carinulae converging towards epistomal margin; vestiture of long sparse hairs. Eyes elongately oval, broadly emarginate almost half of its wide. Antennal club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring at the apex, truncated face with two recurved sutures; posterior face devoid of any suture.



**Fig. 77** : *Xylosandrus beelsoni* Saha, Maiti and Chakraborti a, Pronotum and elytra in dorsal view; b, enlarged portion of declivital face; c, head, pronotum and elytra in lateral view; d, antenna; e, mesotibia; f, protibia.

Pronotum subglobose, slightly wider than long; basal margin substraight, lateral sides feebly outcurved, anterior margin distinctly rounded and armed with 7-8 small asperities; summit conspicuous on basal third; entire surface with closely set small but distinct asperities in concentric rows, gradually smaller posteriorly except at basal narrow strip, which with only a few sparse small granules; entire surface with long erect hairs and postero-median portion with a dense patch of hairs.

Scutellum smooth, shiny and tongue-shaped.

Elytra upto truncated margin slightly wider than its own length and nearly as long as pronotum; basal margin substraight; declivity converging posteriorly and terminating into an angular apex; discal striae feebly marked by small sparse shallow punctures, each with a microhair; interstriae flat and shiny, much wider than striae with irregular shallow small punctures and with fine hairs. Declivital face abrupt, steep and convex; declivital margin on upper half somewhat rounded and lower half carinate; declivital face with striae 1, 2 and 3 complete, 4 and 5 forming a loop, all the striae marked by a row of closely set granules and microhairs, replacing punctures; interstitial punctures obsolete, but with irregular comparatively small granules and single row of fine long hairs along with dense coat of pubescence on entire surface. Procoxae moderately separated from each other, protibiae with 5 and both meso- and meta-tibiae with 8 teeth.

*Male* : Unknown.

*Distribution* : INDIA : *West Bengal* : Darjiling Dist., Rangirum. ELSEWHERE : None.

*Host* : *Symplocos theaefolia*.

*Remarks* : The species is very close to *X. discolor*, but can easily be separated by its abrupt and steep declivital face, feeble discal striae, very distinct pronotal summit, etc. It is a rare species so far only known to infest a single host from its type-locality at Rangirum, Darjiling, West Bengal.

### 85. *Xylosandrus butamali* Beeson

(Fig. 78)

#### 1. *Xyleborus butamali* Beeson

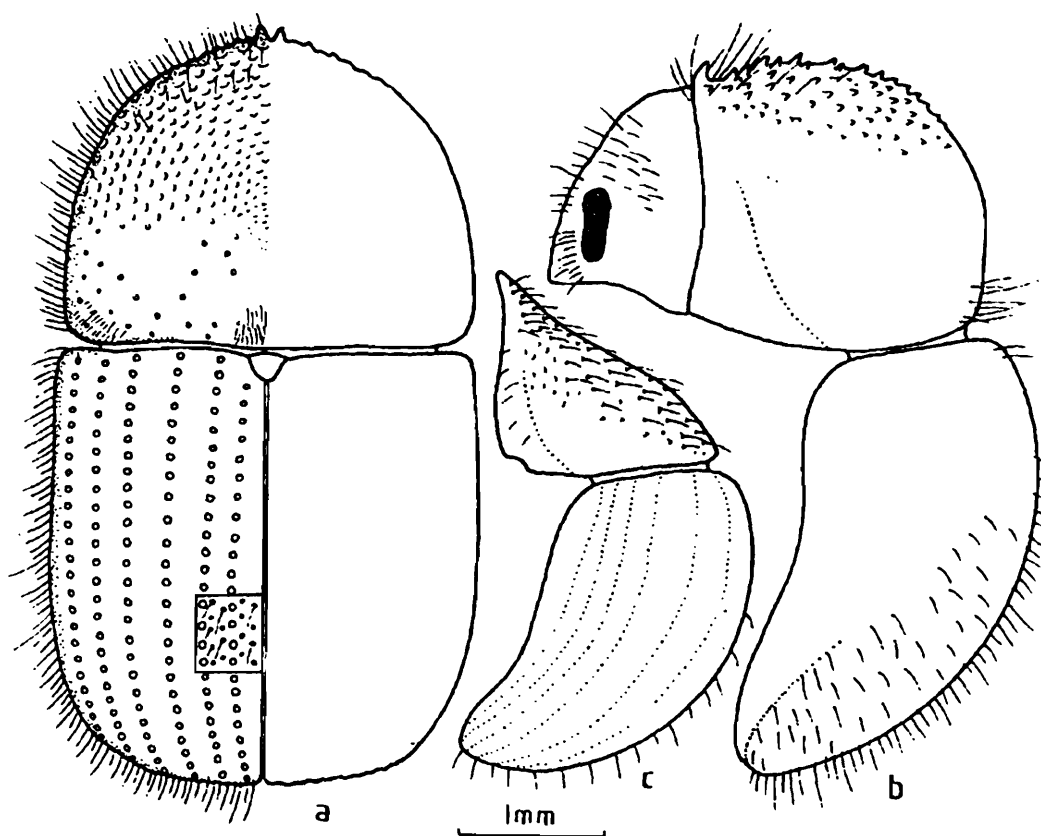
1930. Beeson, *Indian Forest Rec., (Ent.)*, 14 (10) : 216, 217 and 229, *Holotype* : Female in F.R.I., Dehra Dun, *Type-locality* : Agsur and Dandeli, Karnataka, India.

1979. Schedl, *Nat. Mus. Wien Entomologie*, 3 (2) : 49.

1977. Kumar and Chandra, *Oriental Ins.*, 11 (1) : 33, plate, 3, a-1, Male

#### 2. *Xylosandrus butamali* (Beeson)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 788.



**Fig. 78 :** *Xylosandrus butamali* Eggers, Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view. Male : c, pronotum and elytra in lateral view.

*Description : Female :* Body broad and stout; head blackish brown, pronotum and elytra pitchy black, antennae and legs light brown; body densely hairy. Body length 5.20-5.50 mm, 1.8 times as long as its width.

Frons plano-convex; surface finely reticulate with moderately close, deep scattered punctures and a few long hairs. Eyes comparatively small and moderately emarginate.

Pronotum globose; 1.3 times as wide as long; basal margin substraight; lateral sides moderately outcurved with anterior margin broadly rounded accommodating 5-6 asperities, middle two largest; summit nearly at the middle; distinct asperities on anterior declivous portion, gradually larger anteriorly; posterior half with minute sparse punctures, vestiture of short hair and long hair only along the margin, and with tuft of hairs on posterior median portion.

Scutellum large and tongue shaped.

Elytra 1.5 times as long as pronotum; lateral sides subparallel on basal two thirds and broadly rounded posterior margin; postero-lateral margin with distinct small granules; discal striae and interstriae, hardly demarkated; interstriae much wider with irregular rows of large punctures and with long erect hairs laterally. Declivity commencing nearly at middle, face weakly convex and gradually sloping posteriorly;

striae feebly impressed with distinct close punctures, each with a microhair; interstriae flat with irregular punctures and granules, and with long erect dense hairs. Procoxae subcontiguous, protibiae with 5 and meso- and meta-tibiae with 9 teeth.

*Male* : Body small and reduced; body length, 4.20-4.25 mm. Head concealed under the projection of pronotum; frons roughened with few deep punctures. Eyes indistinctly emarginate on anterior margin. Antennae as in female, but reduced. Pronotum subtriangular with all the sides curved; anterior margin angularly rounded; wider than long; entire surface with weak asperities, densely hairy, but granulate anteromedially on a depressed surface; median line weakly marked.

Elytra distinctly broader than pronotum, almost spherical, strongly convex from base to apex, almost as long as broad; laterally rounded; discal striae marked by distinct small punctures; interstriae with irregular punctures and hairs, very much wider than striae; striae 1, 2, 3, 6 and 8 running upto tip of elytra; surface densely coated with long and short hairs.

*Distribution* : INDIA : *Karnataka* : Agsur and Dandeli. ELSEWHERE : None.

*Hosts* : *Dillenia pentagyna* and *Terminalia tomentosa*.

*Remarks* : The species is a very rare one so far only known from India, and known to infest only two hosts. It is very close to *X. ursulus*, except its larger size, posterolateral margins with smaller granules, and tibiae with 5 : 9 teeth (*vs. X. ursulus* with 6 : 8).

## 86. *Xylosandrus crassiusculus* (Motschulsky) (Fig. 79)

### 1. *Phloeotrogus crassiusculus* Motschulsky

1866. Motschulsky, *Bull. Soc. Imp. Nat. Moscow*, **39** : 403. 3 Syntypes Females in Zoological Institute, Academy of Science, Moscow. *Type-locality* : Mountain near Nuwara Eliya, Sri Lanka.

### 2. *Xyleborus crassiusculus* (Motschulsky)

1969. Wood, *Gt. Basin Nat.*, **29** : 119.

1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 607.

### 3. *Xylosandrus crassiusculus* (Motschulsky)

1982. Wood, *Mem. Gt. Basin Nat.*, no. 6 : 766-768 (detailed synonymies).

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 145-148, fig 41, a-d.

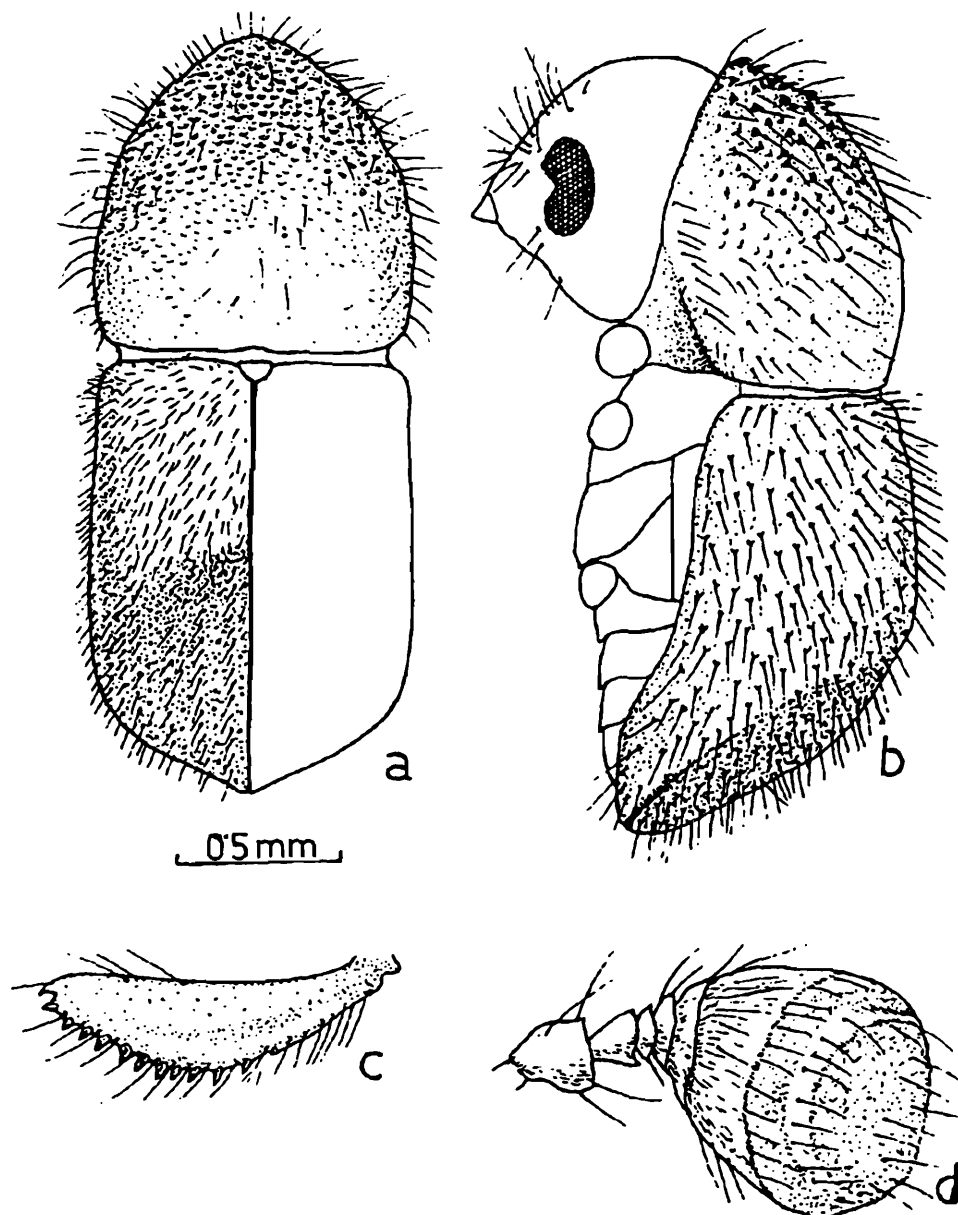
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 790-792.

1992. Saha, Maiti and Chakraborti, *Rec. zool. Surv. India*, **91** (1) :

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 836, 837 (detailed synonymies).

*Description : Female* : Body stout and broad; head and pronotum chestnut brown, elytra comparatively darker, antennae and legs paler. Body length 2.20-2.50 mm, 2.5 times as long as wide.

Frons weakly convex with a distinct median line, surface coarsely granulate and with erect hairs, a few distinct carinulae on either side of median line converging towards epistomal margin; sparsely punctate towards vertex. Eyes elongately oval, nearly half of its width divided by emargination. Antennal scape short and stout; club obliquely truncate, on anterior face, basal corneous portion with recurved apical margin forming a complete ring; truncated face with one suture and posterior face devoid of any suture.



**Fig. 79** : *Xylosandrus crassiusculus* (Motschulsky), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, mesotibia; d, antenna.

Pronotum nearly as long as wide, basal margin substraight. lateral sides weakly outcurved. anterior margin narrowly rounded accommodating 8-9 weak asperities; summit feebly marked at the middle; nearly anterior two-thirds with fine asperities and presence of both small and long hairs; posterior portion finely reticulate with distinct punctures and usually with sparse fine hairs, more denser towards basal margin.

Scutellum fairly large and tongue-shaped.

Elytra 1.20-1.30 times as long as pronotum, 1.20-1.30 times as long as its own width; basal margin substraight; lateral sides subparallel upto basal two-thirds thence broadly rounded posteriorly; postero-lateral margins distinctly elevated with prominent carinae and confluent with interstria 7; disc smooth and shiny; striae not so impressed and marked by small and shallow punctures, each with a microhair; interstriae at least 3 times as wide as striae with irregular 2-3 rows of shallow punctures as in striae and granulate posteriorly; interstriae with long erect hairs. Declivital face uniformly convex and gradually sloping, feebly elevated towards sutural apex; surface opaque and striae punctures obsolete, rather with confused granules throughout; vestiture consisting of small fine hairs and also uniseriate row of long stout setae.

*Male* : Male deformed in shape and dwarf in size; pronotum devoid of asperities; elytra more gradually arched towards apex.

*Distribution* : Widely distributed in the Oriental Region to Japan; Pacific islands to Hawaii; tropical Africa and North America (Wood and Bright, 1992, detail distribution).

*Hosts* : *Albizzia lebbek*, *Amoora wallachi*, *Lasiococca* sp. *Acrocarpus fraxinifolius*, *Cedrela toona*, *Cryptocarya wightiana*, *Macaranga denticulata*, *Ostodes paniculata*, *Litsaea elongata*, *Schima wallichii*, *Sapium euginiaefolium*, *Terminalia procera*.

*Remarks* : The species was first described as *Phloeotrogus crassiusculus* by Motschulsky as early as in 1866 from Sri Lanka. *Xyleborus semiopecus*, a widely distributed species in India, has been treated under the genus *Xylosandrus* by Wood (1982) which has been followed by Saha *et al.* (1992) and Saha and Maiti (1996). The detailed synonymy of the species dealt by Wood (1982), Maiti and Saha (1986) and Wood and Bright (1992) reveals that as many as 7 species have been treated as its synonymy. These species are *Xyleborus semiopacus* Eichhoff, *X. semigranosus* Blandford, *Dryocoetes bengalensis* Stebbing, *Xyleborus mascarenius* Hagedorn, *X. okoumeensis* Schedl, *X. declivigranulatus* Schedl and *Xyleborus ebriosus* Niisima.

It is a very variable and common pin hole borer infesting the cut poles, branches of varied sizes of logs and newly swan timber of numerous host-plants in Indian as referred to above. Information of gallery pattern and host records may be available in Stebbing (1908), Beeson (1930 and 1941), Maiti and Saha (1986), Saha, Maiti and Chakraborty (1992) and Saha and Maiti (1996).

**87. *Xylosandrus difficilis* (Eggers)**  
(Fig. 80)

**1. *Xyleborus difficilis* Eggers**

1923. Eggers, *Zool. Meded.*, **7** : 174 and 175, Female, Allotype and 3 Paratype, in *Nat. Hist. Mus. Wien. Type-locality* : Java, Indonesia.
1930. Beeson, *Indian Forest Rec., (Ent.)*, **14** (10) : 56.
1942. Schedl, *Tijdschr. Ent.*, **85** : 29, Male
1951. Schedl, *Tijdschr. Ent.*, **93** : 42.
1959. Nunberg, *Ent. Ber.*, **9** (3-4) : 423, pl. 19, Fig. 3-4.
1965. Schedl, *Ark. Zool.*, **18** (2) 3 : 24.

**2. *Xylosandrus difficilis* (Eggers)**

1961. Browne, *Malay. Forest Rec.*, no. 22, pp. 165-166.
1963. Browne, *Ent. Ber.*, **23** : 55.
1979. Schedl, *Nat. Mus. Wien. Entomologie*, **3** (2) : 80.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 794.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 837-838.

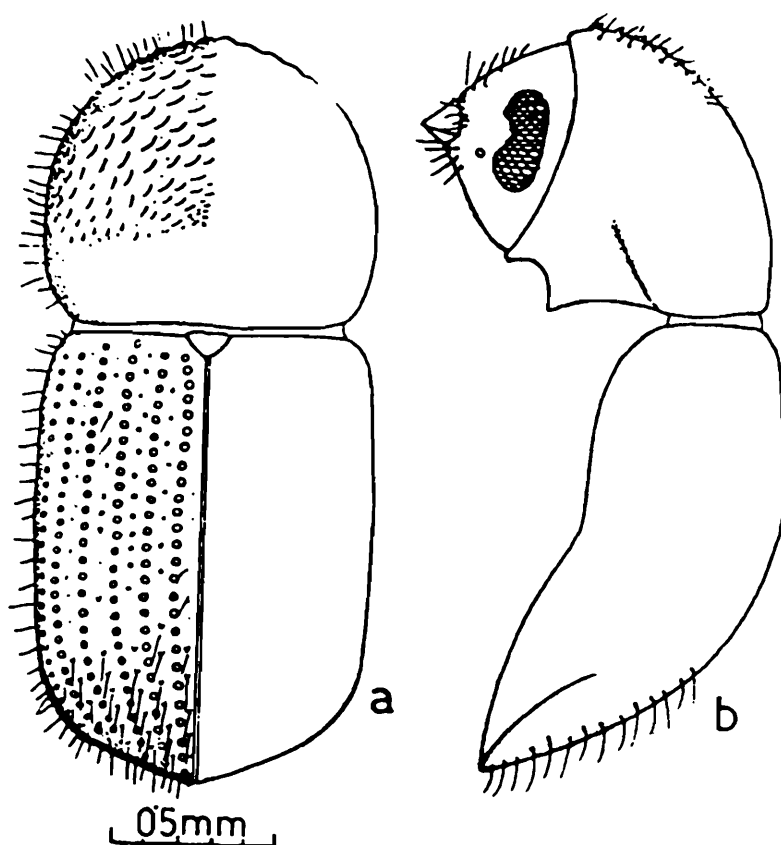
*Description : Female* : Body short and stout; head, pronotum and elytra reddish brown to blackish brown. Body length 2.10-2.25 mm, 2.1-2.2 times as long as wide.

Frons plano-convex, with either weakly or fairly developed median line; surface reticulate with sparse shallow punctures and long erect hairs. Eyes elongately oval and less than half of its width emarginate. Antennal scape short and stout; funicle with 3 segments; club obliquely truncate on anterior face, basal corneous portion with recurved apical costae margin forming a complete ring; truncated face with recurved suture; posterior face devoid of any suture.

Pronotum 1.1 times as wide as long; basal margin substraight; lateral sides feebly outcurved and converging anteriorly; anterior margin broadly rounded accommodating 7-9 fairly distinct asperities; summit indistinct; anterior half with closely set transverse asperities, those on anteriorly rather pointed and upwardly directed, and arranged somewhat in concentric rows, gradually becoming smaller posteriorly; posterior half shiny with punctures and inconspicuous hairs, except on postero-median portion.

Scutellum subtriangular and comparatively large.

Elytra nearly 1.5 times as long as pronotum and 1.3 times as long as its width; basal margin substraight; lateral sides subparallel upto basal three fourths, thence converging posteriorly with broadly rounded apex; discal striae marked by shallow sparse punctures, devoid of any microhair; interstriae flat, shiny much wider than



**Fig. 80 :** *Xylosandrus difficilis* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

striae, with uniseriate minute punctures and sparse erect hairs. Declivity commencing behind the middle, face steep and convex; postero-lateral margins distinctly carinate and confluent with interstria 7; striae 1, 2 and 3 outcurved at the level of anterior portion of posterior half of declivity, marked by distinct close punctures; interstriae with uniseriate sparse granules and long erect hairs. Procoxae widely separated from each other. Protibiae with 5 and both meso- and meta-tibiae with 10 teeth.

*Male* : Male not available for study.

*Distribution* : INDIA : Assam : Lakhimpur Upper Dihing Reserve. West Bengal : Darjiling Dist. : Lopchu, Rangirum, Senchal Range and Tista Valley. ELSEWHERE : Indonesia (Borneo, Celebes, Java and Sumatra), Malaysia and extends across the pacific as far as Fiji.

*Hosts* : *Aphanamixis polystachya*, *Beilschmiedia sikkimensis*, *Gmelina arborea*, *Juglans regia* and *Litsaea elongata*.

*Remarks* : *Xylosandrus difficilis*, a closely allied species to *X. mesuae*, infests predominantly the stout twigs, poles and branches of smaller diameters. The species is never considered an economically important one, since the damage caused to the wood is generally superficial in nature. The colour varying from reddish brown to complete black is a common feature of the species.

88. *Xylosandrus discolor* (Blandford)  
(Fig. 81)

1. *Xyleborus discolor* Blandford

1898. Blandford, *Trans. ent. Soc. Lond.*, p. 429, *Holotype* : Female in B. M. Nat. Hist., London.  
*Type-locality* : Sri Lanka.
1939. Eggers, *Arb. morph. taxon. Ent.*, 6 : 119, male (as *Xyleborus posticestriatus*).

2. *Xylosandrus discolor* (Blandford)

1961. Browne, *Malay. Forest Rec.*, no. 22, pp. 169.
1963. Browne, *Ent. Ber.*, 23 : 55.
1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper No. 86* : 148-151, fig. 42, a and b.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 794.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 836-838.

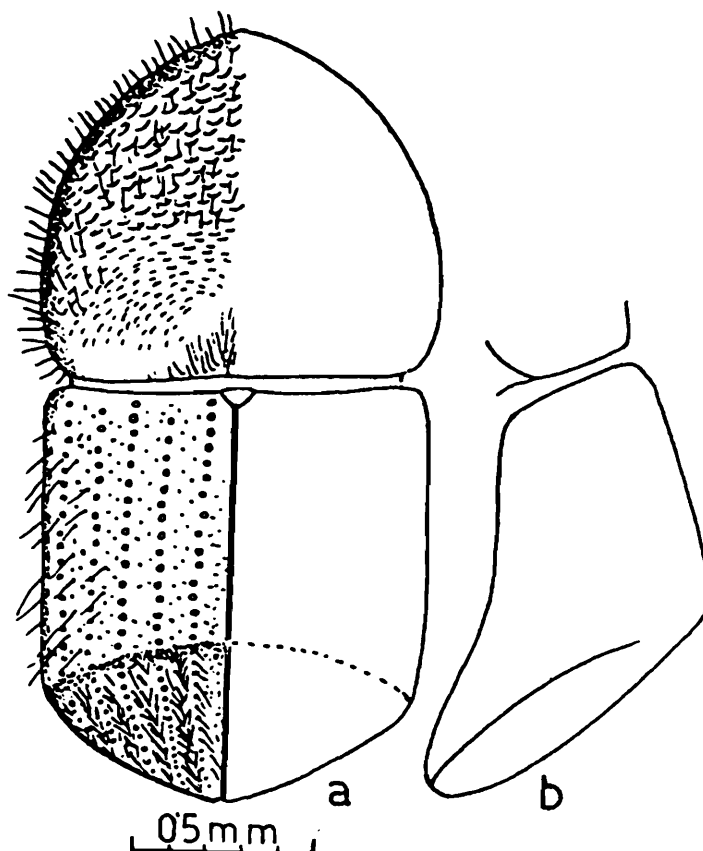
*Description : Female* : Body short and stout; head and pronotum pale brown, elytra blackish brown; antennae and legs pale brown. Body length 1.90-2.00 mm, twice as long as wide.

Frons plano-convex with a feeble median line; surface reticulate with a few shallow punctures towards vertex and a few fine carinulae converging towards epistomal margin; vestiture of erect hairs. Eyes elongately oval, with broadly rounded emargination reaching to almost half of its width. Antennal scape short and stout; funicle with 5 segments; club obliquely truncate, on anterior face; basal corneous portion with recurved costate apical margin forming a complete ring; truncate face with two recurved sutures; posterior face devoid of any suture.

Pronotum subglobose; 1.1 times as wide as long, both basal and lateral margins outcurved, anterior margin distinctly rounded and armed with 7-8 adpeast asperities; summit indistinct, dorsum uniformly convex; entire surface with closely set small but distinct asperities in concentric rows, gradually becoming granulate posteriorly and with small erect hairs throughout; postero-median portion with a dense patch of pubescence.

Scutellum smooth, shiny and tongue-shaped.

Elytra almost as long as pronotum and its own width; basal margin substraight; lateral sides subparallel upto basal fifth, whence strongly converging posteriorly and terminating into an angular apex; discal striae feebly impressed, marked by small shallow linear punctures, each with a microhair; interstriae much wider than striae, with irregular shallow small punctures and sparse hairs. Declivital face abrupt, steep and convex, and declivital margin on upper half somewhat rounded and lower half carinate; striae 1, 2 and 3 complete, 4 and 5 forming loop, all the striae marked by single row of closely set granules and microhairs replacing punctures; interstitial



**Fig. 81 :** *Xylosandrus discolor* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, elytra in lateral view.

punctures also obsolete, but with irregular comparatively small granules and a single row of erect small hairs along with microhairs on entire surface. Procoxae moderately separated from each other, protibiae with 4 and both meso- and meta-tibiae with 8 teeth.

*Male* : Male not available for study.

*Distribution* : INDIA : *Andaman Island* : North Andaman; *Assam* : Halflong Dist., Halflong; *Karnataka* : Bangalore; *Meghalaya* : Shillong; *Sikkim* : Rongpo; *Tamil Nadu* : Nilgiri (Hillgrove, 1330 m); *Uttar Pradesh* : Dehra Dun; *West Bengal* : Darjiling Dist., Tista and Samsingh. ELSEWHERE : Myanmar, Indonesia (Java), Malaysia, Sri Lanka, Sumba Island and Taiwan.

*Hosts* : *Albizzia moluccana*, *Cassia multijuga*, *Cedrela toona*, *Ficus glomarata*, *Grevillea robusta*, *Juglans regia*, *Lonicera caprifolium*, *Michilus odoratissima*, *Mallotus philippinensis*, *Mangifera indica*, *Mesua ferrea*, *Pongamia glabra*, *Swietenia mahagonia*, *Tephrosia caudata*, *Terminalia myriocarpa* and *T. procera*.

*Remarks* : The species, *Xylosandrus discolor* has the unique character in possessing declivital striae marked by uniseriate close granules replacing punctures like those of *Xylosandrus beelsoni* Saha, Maiti and Chakraborty and *X. crassiusculus* (Motschulsky). This is a fairly common shoot- and twig-borer of many a green plants

in India, Sri Lanka, Myanmar, Malaysia and Indonesia. The biological features, such as developmental period, emargence of adults, gallery pattern, nest, brood size, etc. have been studied by different authors in different countries, namely, Beeson (1930 and 1941) in India, Browne (1961) in Malaya, Kalshoven (1958 and 1959) in Indonesia and Schedl (1959) in Sri Lanka.

**89. *Xylosandrus gravidus* (Blandford)**  
(Fig. 82)

**1. *Xyleborus gravidus* Blandford**

1898. Blandford, *Trans. ent. Soc. Lond.*, p. 429, *Holotype* : Female in B. M. Nat. Hist., London.  
*Type-locality* : Chittagong hill tracts, Bangladesh.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 105.
1914. Stebbing, *India Forest Insects (Coleopt.)*, 586 p., Bangladesh.
1975. Beaver and Browne, *Oriental Ins.*, **9** (3) : 298
1977. Kumar and Chandra, *Oriental Ins.*, **11** (1) : 34, pl. 4.
1986. Saha and Maiti, *Rec. zool. Surv. India*, **81** (3 &4) : 6.

**2. *Xylosandrus gravidus* (Blandford)**

1992. Saha, Maiti and Chakraborti, *Rec. zool. Surv. India*, **91** (1) : 19-21. Fig. 5, a-c.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 796.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 838, 860, Fig. 20, a-c.

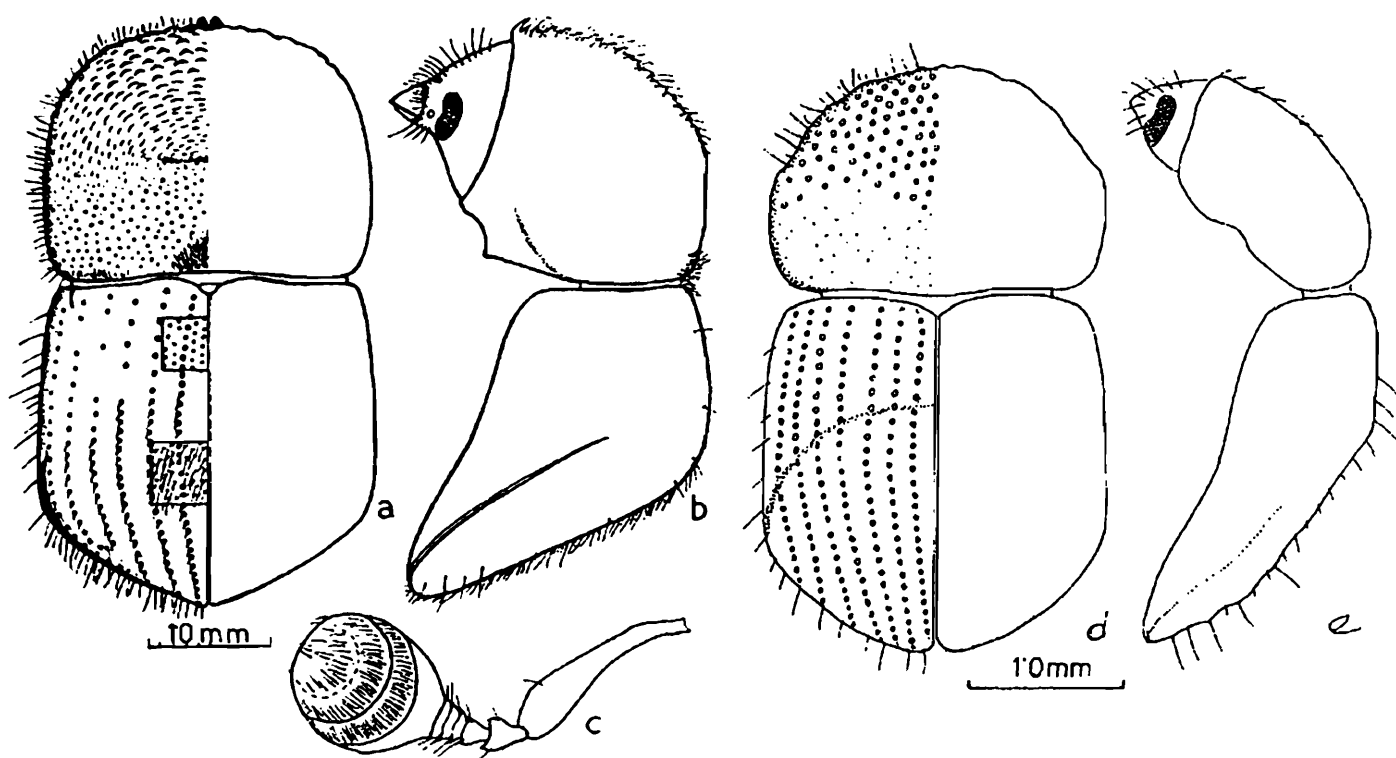
*Description* : *Female* : Body short and stout; head, posterior half of pronotum, antennae and legs yellowish brown; anterior slop of pronotum and elytra deep reddish brown and sometimes entire body reddish brown in colour. Body length 4.80 mm, 1.7 times as long as wide.

Frons feebly convex, medially slightly elevated with indistinct or obsolete median line, surface shiny with irregular punctures and long erect hairs. Eyes elongately oval and feebly emarginate. Antennal scape long and slender; funicle with 5 segments; club obliquely truncate; on anterior face, basal corneous portion reduced with recurved apical margin forming a complete ring being subapical on posterior face indicating a suture; truncated face with two more recurved sutures; posterior face devoid of any suture.

Pronotum 1.1-1.2 times as wide as long; basal margin substraight with median broad emargination; lateral sides feebly outcurved, anterior margin produced to accommodate at least 6 pointed asperities, middle two very distinct; transverse asperities gradually reducing in size and becoming closer posteriorly; posterior half shining with distinct sparse minute punctures; vestiture of long hairs only on anteriorly and laterally, postero-median portion with a dense patch of recumbent hairs.

Scutellum small, distinctly broader than long.

Elytra 1.3 times as long as pronotum and nearly as long as its width; basal margin feebly outcurved at the level of interstriae 2 and 3; lateral sides subparallel whence strongly converging posteriorly and terminating into an angular apex; discal striae marked by sparse shallow and small punctures, devoid of any distinct microhair; interstriae much wider than striae, surface flat and shiny with irregular row of minute punctures and a few sparse small hairs. Declivital face steep and flatly convex with oblique surface, declivital margins on upper half rounded and strongly carinate on lower half; striae marked by comparatively small punctures, each puncture with a microhair; all interstriae much wider with 5-6 irregular rows of granules; surface with vestiture of short recumbent hairs. Procoxae subcontiguous; protibiae with 6 and both meso- and meta-tibiae with 11 teeth.



**Fig. 82** : *Xylosandrus gravidus* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view; c, antenna. Male : d, pronotum and elytra in dorsal view; e, head, pronotum and elytra in lateral view.

**Male** : Males are more or less similar to females, but reduced and deformed. Head not concealed by pronotum with plano-convex frons and eyes very feebly emarginate. Body length.

Pronotum globose, margins weakly outcurved; in profile, uniformly convex from base to apex; surface somewhat smooth with fine punctures throughout, more prominent on anterior portion; anterior margin with a few minute asperities. Elytral declivity commencing at anterior one-third whence gradually sloping towards the

apex with plano-concave surface; posterior two-thirds with distinct lateral margins, more prominently so near the tapering apex; discal striae well marked by punctures, interstriae with sparse hairs, more prominent towards apex.

*Distribution* : INDIA : Assam : Cachar : Halflong; Sibsagar, Central Range, Nambor Reserve; Lakhimpur, Upper Dihing Reserve. Sikkim : Mantham. West Bengal : Darjiling Dist. : Pashok and Samsingh. ELSEWHERE : Bangladesh, Laos, Malaysia, North Vietnam, Thailand, Sri Lanka, Myanmar and Xizang (Tibet) in China.

*Hosts* : *Cinnamomum cecicodaphne*, *Mesua ferrea*, *Swietenia mahagoni* and *Vatica lanceafolia*.

*Remarks* : The species is a fairly widely distributed one in the South-east Asia. It varies widely in colour pattern, some beetles are deep brown throughout; in others, head, posterior half of the pronotum, antennae and legs are yellowish brown in colour. The subcontiguous procoxae keep the species separate from all others of the genus measuring less than 4.00 mm.

90. *Xylosandrus jaintianus* (Schedl)  
(Fig. 83)

1. *Xyleborus jaintianus* Schedl

1967. Schedl, *Ent. Tidskr.*, **88** : 161, *Holotype* : Female in Nat. Hist. Mus. Wien. *Type-locality* : Shillong, Meghalaya, India.

2. *Xylosandrus jaintianus* (Schedl)

1980. Schedl, *Nat. Mus. Wien Entomologie*, **3** (2) : 129.

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 796.

3. *Apoxyleborus jaintianus* (Schedl)

2000. Saha and Maiti, *State Fauna Series 4 : Fauna of Meghalaya*, Part 5 : 641, 644.

*Description* : *Female* : Body short and stout; head and pronotum yellowish brown and elytra reddish brown; elytral apex vertically truncated posteriorly like that of *A. mancus*. Body length 3.00 mm, nearly twice as long as wide.

Frons convex with a distinct median line; surface finely reticulate with distinct aciculation converging towards epistomal margin and with fine sparse punctures and hairs. Eyes and antennae very similar in all the species of the genus known from India.

Pronotum slightly wider than long; anterior margin with 7-8 asperities; summit less pronounced, rather weakly marked and placed nearly at posterior one-third; anterior area above the summit with small adpeast asperities; posterior area with fine granules; entire surface with small bent hairs and a tuft of comparatively long hairs on postero-median portion occupying more transverse space.

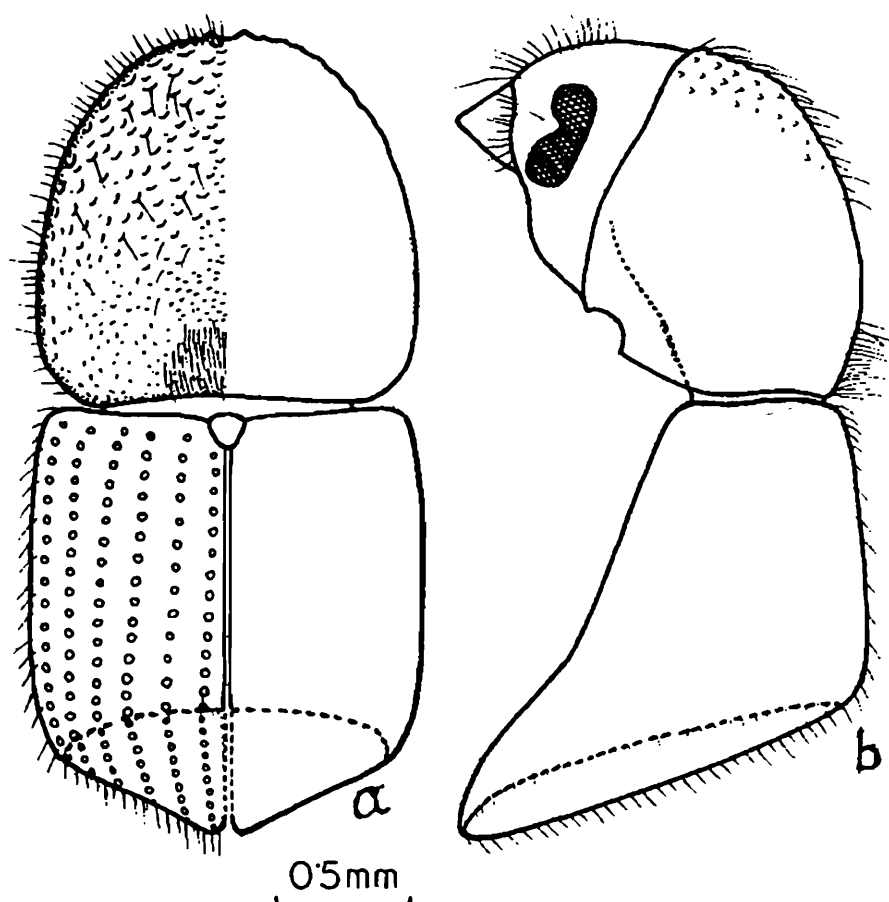
Scutellum large and tongue-shaped.

Elytra upto upper truncated margin smaller than pronotum as well as its own width; basal margin broadly concave; lateral sides subparallel upto declivital margin, then truncated behind; discal striae indistinctly marked by minute sparse punctures, devoid of any microhair; interstriae much wider than striae, somewhat smooth and shiny with irregular punctures, hairs inconspicuous except laterally. Declivity truncate with distinct circumdeclivital costa; declivital face flat but with elevated sutural interstria 1; each stria marked by a row of closely set large granules, replacing punctures; striae 1, 2 and 3 complete, forming a loop with apical end of stria 5; interstriae with comparatively fine granules and set with dense coat of long and bent hairs. Procoxae widely separated from each other than in *A. mancus*; protibiae with 4 and meso- and meta-tibiae with 8-9 teeth.

*Male* : Unknown.

*Distribution* : INDIA : *Meghalaya, Shillong.* ELSEWHERE : None.

*Remarks* : The species is so far known only from its type-locality.



**Fig. 83** : *Xylosandrus jaintianus* (Schedi), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

91. *Xylosandrus mancus* (Blandford)

(Fig. 84)

1. *Xyleborus mancus* Blandford

1898. Blandford, *Trans. ent. Soc. Lond.*, : 428-429, *Holotype* : Female in B. M. Nat. Hist. *Type-locality* : Sri Lanka.
1910. Hagedorn, *Coleopt. Cat.*, **26** (4) : 106.
1938. Browne, *Malay. Forest.*, **7** : 27.
1958. Schedl, *Tijdschr. Ent.*, **101** : 149, Male from Java.
1959. Kalshoven, *Tijdschr. Ent.*, **102** : 159.
1978. Beaver and Browne, *Oriental Ins.*, **12** (4) : 609.

2. *Apoxyborus mancus* (Blandford)

1980. Wood, *Gt. Basin Nat.*, **40** (1) : 90.
1988. Beaver, *J. Appl. Ent.*, **105** : 63.

3. *Xylosandrus mancus* (Blandford)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 796-797.

4. *Xyleborus abruptus* Sampson

1914. Sampson, *Trans. Linn. Soc. Zool. Lond.*, **16** : 388, Female, *Type-locality* : Seychelles, Male.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 59 (Synonymy).

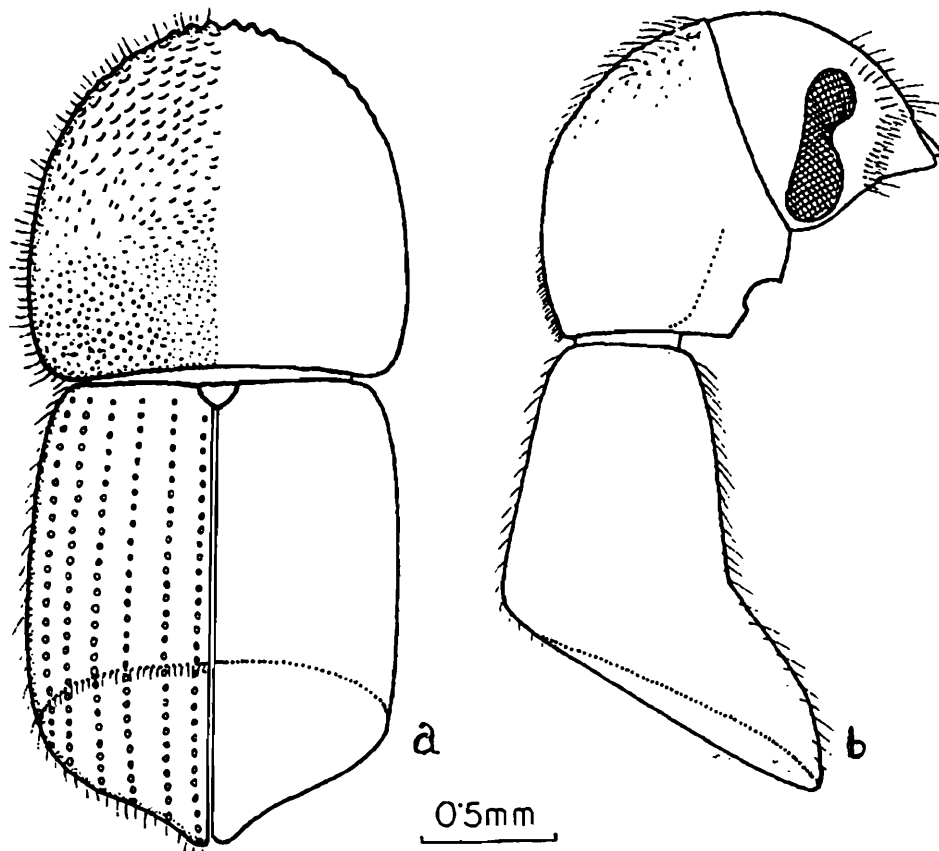
5. *Xyleborus mancus* var. *formosanus* Eggers

1930. Eggers, *Indian Forest Rec.*, **14** (9) : 10-11, Female, *Type-locality* : Formosa.
1966. Schedl, *Entom. Abh. Mus. Tierk. Dresden*, **35** : 59 (Synonymy).

*Description* : *Female* : Body comparatively large, stout and cylindrical; head, pronotum and elytra yellowish brown to reddish brown, gradually darker towards apex; elytral apex more or less vertically truncated. Body length 3.30-3.45 mm, 1.70 times as long as wide.

Frons convex, median line either indistinctly or somewhat distinctly marked, surface finely reticulate with indistinct aciculation and with fine sparse punctures and erect hairs.

Pronotum slightly wider than long; anterior margin with 7-8 distinct asperities, summit indistinctly marked almost at the middle; anterior half armed with distinct asperities and with longer hairs than other two species; posterior half shiny with close minute punctures, vestiture consisting of fine rather short and dense hairs with a tuft of hairs on postero-median portion occupying narrow space than the other two species, namely, *X. jaintianus* and *X. subsimilis*.



**Fig. 84** : *Xylosandrus mancus* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Elytra upto truncated margin 1.1 times as wide as long and 1.1 times as long as pronotum; disc shiny, interstriae 3-4 times wide than striae with confused indistinct punctures and with long erect hairs; declivital face somewhat flat but gradually elevated towards apex as in *X. jaintianus*; striae distinctly marked by large close shallow punctures more or less of its own width, striae 1, 2 and 3 complete and 4 incomplete, terminal and of stria 5 not visible (unlike other two species); interstriae with irregular punctures and with finely granules towards apex; declivity obliquely truncated, circumdeclivital margin fringed with hairs, face devoid of any distinct hairs. Procoxae less widely separated than the other two species, protibiae with 4-7 and mesotibiae with 10-12 socketed teeth.

*Male* (Schedl, 1958) : Body yellowish brown; 2.1 mm long, twice as long as broad.

Frons flatly convex, strongly shiny with moderately scattered punctures and sparse long hairs.

Pronotum trapezoid, broader than long (29 : 36), lateral margins strongly and anterior margin broadly rounded; dorsal surface weakly or moderately arched and shiny; distinctly punctate at the middle, anterior part slightly upturned; surface with erect minute hairs.

Scutellum moderately large, smooth and devoid of hairs.

Elytra slightly broader than long (32 : 29) and 1.46 times as long as pronotum; nearly basal two-fifths broader, antero-lateral angles subround, sides weakly narrowing posteriorly, hind margin broadly rounded. Declivity gradually slanting posteriorly right from the middle; disc moderately shiny, irregularly, indistinctly and granulately punctate in part; intestriae wide, partly shiny, stria 1 with fairly big punctures; declivital face flatly arched, stria punctures also distinct, entire disc towards basal portion of declivity slightly angularly truncated and elytra with dense coat of hairs, more thicker towards sutural line.

*Distribution* : INDIA : *Karnataka* : Kanara; *Kerala* : Nilambur. ELSEWHERE! Sri Lanka, Indonesia (Java), Malaysia, Philippines, Taiwan, Vietnam, East Africa, Madagascar, Mauritius and Seychelles.

*Hosts* : *Buchanania latifolia* and *Cordia myxa*.

*Remarks* : *Apoxyloborus mancus* was originally described from Sri Lanka and subsequently reported from the Philippines to East Africa including many intervening countries. About a dozen of host is known to be infested by the species in the Orient whereas only two hosts are from South India (Beeson, 1930 and 1941).

It is primarily a borer of poles and branches of trees. The nest contains a circular mother gallery from where short branches and large irregular chambers which may accommodate a brood of about 30. More detailed gallery pattern is also known (Browne, 1961).

## 92. *Xylosandrus mesuae* (Eggers) (Fig. 85)

### 1. *Xyleborus mesuae* Eggers

1930. Eggers, *Indian Forest Rec.*, 14 (9) : 6, *Holotype* : Female in F.R.I., Dehra Dun. *Type-locality* : Kalimpong, West Bengal, India.  
1966. Schedl, *Trans. Roy. ent. Soc. Lond.*, 111 : 495.

### 2. *Xylosandrus mesuae* (Eggers)

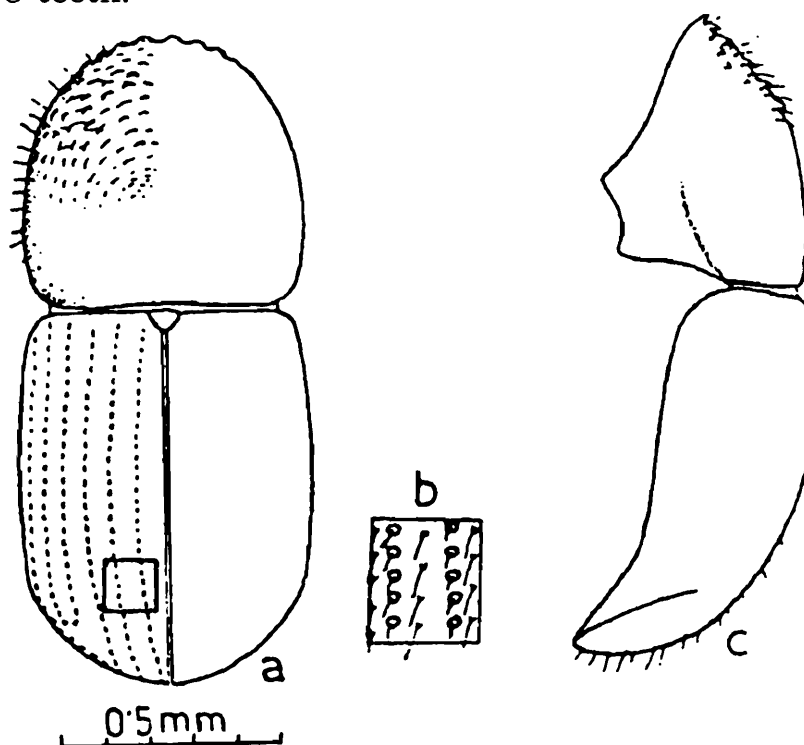
1963. Browne, *Ent. Ber.*, 23 : 55.  
1992. Saha, Maiti and Chakraborti, *Rec. zool. Surv. India*, 91 (1) : 21-23. Fig. 6, a-c.  
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 797.  
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 836, 838.

*Description* : *Female* : Body short and stout; colour yellowish brown, elytra comparatively darker. Body length 1.46 mm (original 1.1 mm), 2.3 times as long as wide.

Head largely concealed under pronotum; frons plano-convex with scattered punctures; epistomal margin with a very few short hairs. Eyes feebly emarginate. Antennal scape short, club obliquely truncate; on anterior face, basal corneous portion with recurved costate apical margin forming a complete ring; truncate face with two recurved sutures; posterior face devoid of any suture.

Pronotum just wider than long, basal margin substraight, lateral sides subparallel upto half, then converging anteriorly, anterior margin narrowly rounded and armed by 9-10 closely set asperities; summit indistinct; anterior half with fine transverse asperities and few recumbent hairs; posterior half shiny, and punctures and hairs indistinct.

Elytra 1.47 times as long as pronotum, 1.33 times as long as its width, basal margin substraight, lateral sides subparallel upto three-fourths, thence broadly rounded posteriorly; posterolateral margins forming distinct carinae, which extending upto interstria 7, discal striae marked by distinct punctures; interstriae flat shiny with a few widely placed indistinct punctures. Declivital face abruptly sloping, face flatly convex; striae distinctly impressed with close and large punctures, each with a microhair; interstriae feeble elevated with uniseriate row of fine granules and recumbent hairs. Procoxae well separated; protibiae with 5-6 and both meso- and meta-tibiae with 8 teeth.



**Fig. 85 :** *Xylosandrus mesuae* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral declivity; c, pronotum and elytra in lateral view.

*Male* : Unknown.

*Distribution* : INDIA : West Bengal : Darjiling Dist., Kalimpong. Uttar Pradesh : (? Siwalik). ELSEWHERE : Sri Lanka.

*Host* : *Mesua ferrea*.

*Remarks* : The species is so far known only from the hilly tract of Darjiling in India. According to Beeson (1930), its record from the Siwalik (Phandowala) in U.P., is probably as error. It is reported as a twig borer of a dying *Mesua ferrea* in associated with *Xyleborus mucronatulus* Eggers in Kalimpong (Beeson, 1930 and 1941).

93. *Xylosandrus morigerus* (Blandford)  
(Fig. 86)

1. *Xyleborus morigerus* Blandford

1894. Blandford, *Insect life*, 6 : 264-265, Female and Male Syntype : probably New Guinea; in B.M. Nat. Hist., London.
1930. Beeson, *Indian Forest Rec. (Ent.)*, 14 (10) : 73.
1959. Schedl, *Trans. Roy. ent. Soc. Lond.*, 111 : 495.
1960. Wood, *Insects of Micronesia*, 18 (1) : 51, 53 and 54.
1962. Schedl, *Rev. Ent. Moc.*, 5 (1) : 111-137.

2. *Xylosandrus morigerus* (Blandford)

1913. Reitter, *Wien. ent. Ztg.*, 32 (2) : 83.
1963. Browne, *Ent. Ber.*, 23 : 55.
1978. Beaver and Browne, *Oriental Ins.*, 12 (4) : 614.
1992. Saha, Maiti and Chakraborti, *Rec. zool. Surv. India*, 91 (1) : 23-24. Fig. 7, a-c.
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 797.
1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 836, 839.

3. *Xyleborus coffeae* Wurth

1908. Wurth, *Cultuurgides 10, Tweede Gedeelte*, p. 63-78, Female and Male, *Type-localities* : Java and Tonkin.

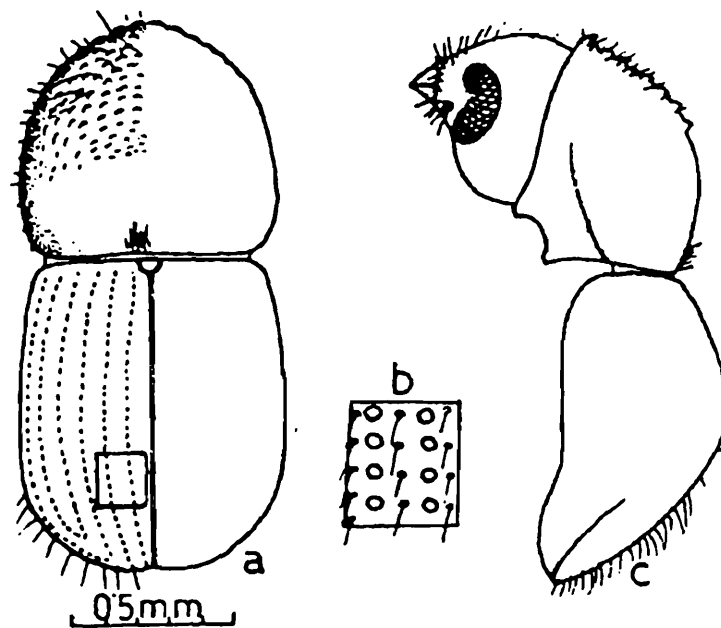
4. *Xyleborus luzonicus* Eggers

1923. Eggers, *Zool. Meded.*, 7 : 174, Female, *Type-locality* : Luzon, Philippine.
1974. Wood, *Gt. Basin Nat.*, 34 (94) : 287 (Synonymy).

*Description : Female* : Body short and stout, colour yellowish brown to complete black, antennae and legs rather paler. Body length 1.60-1.70 mm, nearly twice as long as wide.

Head globose, frons feebly convex with a distinct median line; surface finely reticulate with sparse fine granules and long erect hairs. Eyes elongately oval, broadly emarginate upto half of its width. Antennal scape short and stout, club obliquely truncate, on anterior face, basal corneous portion with recurved apical margin forming a complete ring, another recurved suture visible in some specimens, posterior face unmarked by any suture.

Pronotum 1.1 times as wide as long, basal margin substraight, lateral sides feebly outcurved with narrowly rounded anterior margin accommodating 5-6 transverse asperities; summit indistinct; anterior half with weak transverse asperities in concentric



**Fig. 86 :** *Xylosandrus morigerus* (Blandford), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytra declivity; c, head, pronotum and elytra in lateral view.

rows and bent hairs; posterior half without any punctures or granules; a few hairs lateral and at postero-median portion.

Scutellum comparatively large and tongue shaped.

Elytra 1.3 times as long as pronotum and 1.1 times as long as its width, slightly wider than pronotum; basal margin substraight; lateral sides subparallel upto four-fifths with broadly rounded apex; postero-lateral margin elevated forming distinct carinae, extending to interstria 7; in profile, disc strongly convex, arching from base; surface smooth and shiny with indistinct striae marked by minute punctures, devoid of any microhair; interstriae flat with inconspicuous punctures and hairs. Declivital face abrupt, steep and convex; strial punctures rather close and distinct than on disc; interstriae with uniseriate punctures and erect hairs, each puncture sometimes bearing minute granules. Procoxae widely separated, protibiae with 4 teeth and both meso- and meta-tibiae with 6 teeth.

*Male* : Male not available for study.

*Distribution* : INDIA : *West Bengal* : Darjiling Dist. : Tista Valley and Samsingh; Indomalayan Region, imported to East Africa, Polynesia, Europe and America.

*Hosts* : *Eugenia formosa* and some unknown wood (Saha and Maiti, 1996).

*Remarks* : The species is easily recognised by its smaller size measuring less than 2.00 mm and its sutural profile of elytra arching from base to apex. Prior to its first record in India occurring in the sub-Himalayan West Bengal by Saha *et. al.* (1992a), it was only known from the Oriental Islands as a borer of Tea, Coffee, etc. However, it is unknown from such economic plants in India. The development of brood takes exceptionally short period of more than a week in Sri Lanka (Beeson, 1930 and 1941).

94. *Xylosandrus mutilatus* (Blandford)1. *Xyleborus mutilatus* Blandford

1894. Blandford, *Trans. ent. Soc. Lond.*, 103 p., *Holotype* : Female in B. M. Nat. Hist., London.  
*Type-locality* : Japan.

2. *Xylosandrus mutilatus* (Blandford)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 799.

3. *Xyleborus sampsoni* (Eggers)

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 184, *Holotype* : Female in F.R.I., Dehra Dun.  
*Type-locality* : Halflong, Cachar, Assam, India.

1989. Wood, *Gt. Basin Nat.*, 49 : 177 (Synonymy).

4. *Xyleborus banjoewangi* Schedl

1939. Schedl, *Tijdschr. V. Ent.*, 82 : 41, *Type-locality* : Banjoewangi.

1979. Schedl, *Nat. Mus. Wien. Entomologie*, 3(2) : 33 (Synonymy)

5. *Xyleborus taitonus* (Eggers)

1939. Eggers,

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 799 (Synonymy).

*Description* : *Female* : Body very similar to *X. gravidus* (Blandford) except the following characters. Color completely black with brownish tinge. Body length, 4.80 mm. Frons convex with indistinct median line and with irregular punctures and long erect hairs. Pronotum 1.1 times as wide as long; posterior portion of pronotum with close distinct punctures; vestiture of short hairs on entire surface, postero-median portion with a dense transverse patch of recumbent hairs. Scutellum comparatively more shiny, nearly as long as broad.

*Male* : Unknown.

*Distribution* : INDIA : Assam : Halflong and Cachar; Andaman Islands.  
ELSEWHERE : China, Myanmar, Malaysia, Sri Lanka, Indonesia, Korea, Taiwan, Thailand and New Guinea.

*Remarks* : The species distributed widely in the Oriental region is sparsely found only in the eastern part of India.

95. *Xylosandrus subsimilis* (Eggers)

(Fig. 87)

1. *Xyleborus subsimilis* (Eggers)

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 186, *Holotype* : Female in F.R.I., Dehra Dun.  
*Type-locality* : Shillong, Meghalaya, India.

1977. Kumar and Chandra, *Oriental Ins.*, 11 (1) : 36, Male.

1980. Schedl, *Nat. Mus. Wien Entomologie*, 3 (2) : 244.

### 2. *Xylosandrus subsimilis* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 800-801.

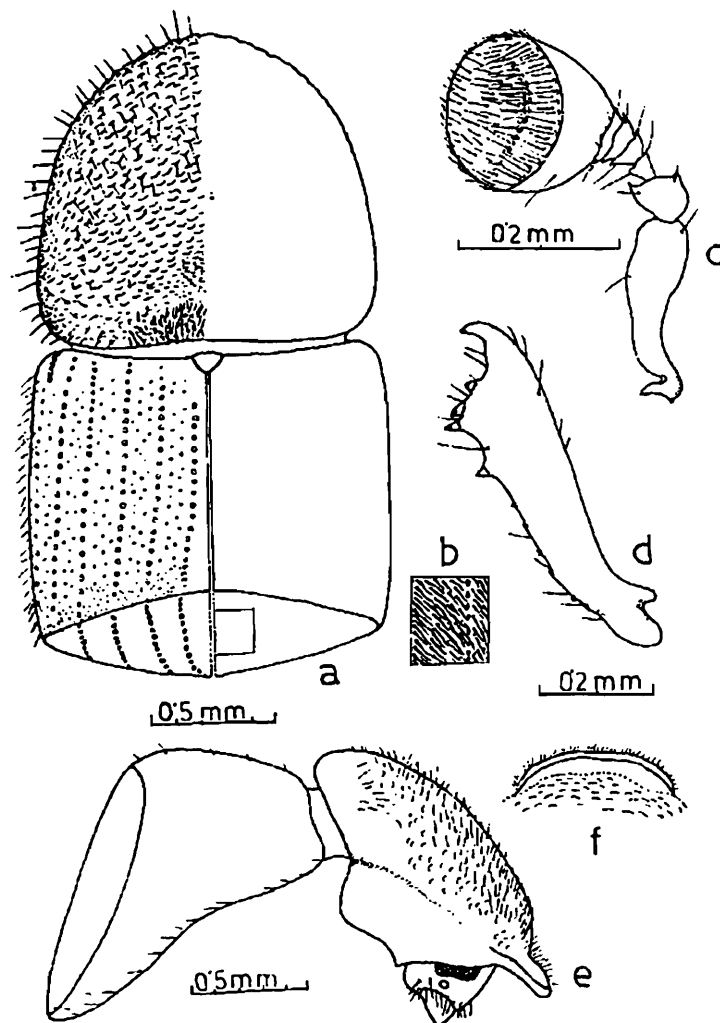
### 3. *Apoxyleborus subsimilis* (Eggers)

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal*, Part 6 (B) : 808-809.

2000. Saha and Maiti, *State Fauna Series 4 : Fauna of Meghalaya*, Part 5 : 641, 644.

**Description : Female :** Body short and stout; head, pronotum and elytra reddish brown; elytral apex darker; declivital face distinctly steep. Body length 2.60-2.70 mm, 1.8 times as long as wide.

Frons convex with an indistinct median line; surface finely reticulate with distinct aciculation converging towards epistomal margin and with fine sparse punctures and hairs.



**Fig. 87 :** *Xylosandrus subsimilis* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, enlarged portion of elytral declivity; c, antenna; d, protibia. Male : e, head, pronotum and elytra in lateral view; f, anterior margin of pronotum in dorsal view.

Pronotum as in *A. jaintianus*.

Scutellum large and tongue-shaped.

Elytra as in *A. jaintianus* except the declivital face completely flat, devoid of elevation on interstria 1 as in *A. jaintianus* and other interstitial surface with dense coat of bifurcate fine hairs. Protibiae with 4 and meso- and meta-tibiae with 9-10 teeth each.

*Male* : Body reduced and somewhat deformed. Head fairly, pronotum and elytral disc densely pubescent. Body length 2.20 mm, 1.80 times as long as wide.

Head concealed under the projected portion of the pronotum; frons plano-convex, shining, feebly wrinkled with minute scattered punctures and hairs; a weak small elevation at the middle of frons slightly above the epistomal margin. Antennae more or less as in female.

Pronotum elongately oval, slightly longer than broad; lateral margins strongly outcurved particularly on basal third, thence converging anteriorly; anterior part fairly projected anteriorly and margin subcircular with a elevated margin forming carina-like process; basal one-third of dorsum strongly convex, thence gradually sloping anteriorly; anterior slope with a small and feebly convex area indicating the impression of head below with defused asperities and becoming gradually granulate posteriorly; posterior third granulately punctate; entire surface with small hairs.

Elytra smooth and shiny, slightly longer than pronotum and obliquely truncate behind; basal margin weakly concave; lateral sides subparallel; postero-lateral margins converging posteriorly, terminating into a narrow sutural angle in each elytron; discal striae fairly prominent marked by small and shallow punctures; interstriae smooth with irregular scattered punctures. Circumdeclivital costa weakly developed on anterior half and strongly developed on posterior half, declivital face broadly concave, but weakly convex on median portion of lower half along the suture; striae 1, 2 and 3 distinct and slightly outcurved below the middle and marked by granules; striae 4 and 5 incomplete and joining the 3rd; all the interstriae with irregular granules and dense coat of minute hairs.

*Distribution* : INDIA : Assam : Cachar, Halflong; Meghalaya : Shillong; West Bengal : Darjiling Dist., Samsingh; Jalpaiguri Dist., Gazalduba. ELSEWHERE.

*Hosts* : *Acrocarpus foxinifolius*, *Amoora wallichii*, *Aphanamixis polystachya*, *Cinnamomum obtusifolium* and *Tectona grandis*.

*Remarks* : *Xylosandrus subsimilis* is a rare species so far known from Assam and Meghalaya in the Eastern India and in Myanmar (Beeson, 1930 and 1941) and is reported here for the first time from the lower hilly tracts of north Bengal. Declivital interstriae with dense coat of bifurcated fine hairs and striae marked by minute granules serve as the distinctive features of the species. Discal striae of some specimens from Shillong are more distinct than those from Darjiling Himalaya.

96. *Xylosandrus terminatus* (Eggers)  
(Fig. 88)

1. *Xyleborus terminatus* (Eggers)

1930. Eggers, *Indian Forest Rec., (Ent.)*, 14 (9) : 183, *Holotype* : Female in F.R.Í., Dehra Dun.  
*Type-locality* : Coorg, Karnataka, India.

2. *Xylosandrus terminatus* (Eggers)

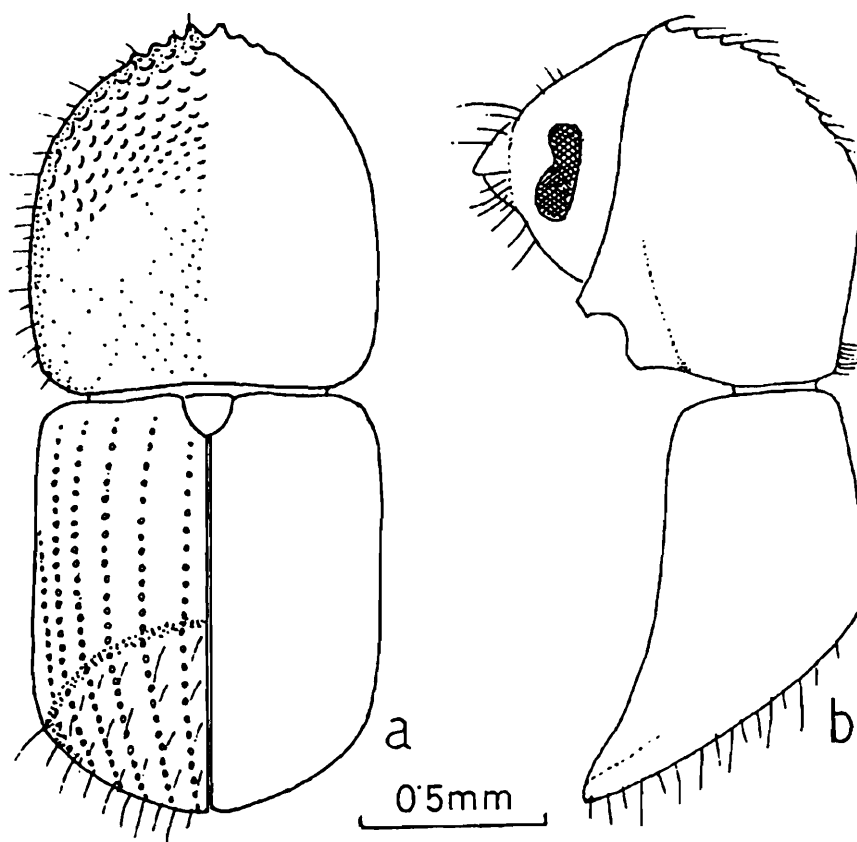
1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 801.

*Description : Female* : Body short and stout; body blackish brown with antennae and legs paler. Body length 1.96-2.00 mm, 2.2 times as long as wide.

Frons convex, surface reticulate with a few shallow punctures and each with a erect hair on either side of smooth median line.

Pronotum nearly as wide as long; lateral sides subparallel with broadly rounded anterior margin, accommodating 6-7 transverse asperities; summit indistinct; anterior half with weak transverse asperities and bent hairs; posterior half smooth and shiny with a few minute sparse punctures, vestiture inconspicuous.

Scutellum comparatively large and tongue-shaped.



**Fig. 88** : *Xylosandrus terminatus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view.

Elytra 1.1 times as long and as wide as pronotum, lateral sides subparallel upto basal fifth, whence strongly converging posteriorly and terminating into an angular apex or broadly rounded apex; disc smooth and shiny; discal striae very feebly marked with shallow sparse punctures; interstriae with minute granules; vestiture inconspicuous. Declivital face abrupt, steep and convex, and declivital margin on upper half somewhat rounded and lower half carinate; striae feebly impressed, 1, 2, 3 and 6 complete, 4 and 5 forming a loop, marked by large, close punctures, devoid of any microhair; interstriae with uniseriate sparse puncture, each with a long erect hair. Procoxae widely separated.

*Male* : Body more or less similar to female, except the following characters. Body reduced, length, 1.35 mm. Pronotum slightly broader than long with small asperities anteriorly, becoming granulate postero-laterally; postero-median portion with a few small sparse punctures. Elytra more or less as in female, but much reduced with somewhat confused striae and interstriae on the disc; striae punctures comparatively distinct on declivital face, but not in a regular row, rather irregularly placed gradually towards declivital apex; sutural line weakly raised; postero-lateral carinae much feeble than female.

*Distribution* : INDIA : *Karnataka* : Coorg. ELSEWHERE : None.

*Host* : *Lantana* sp.

*Remarks* : The species is so far known only from India, and seems very close to *X. morigerus*, a very widely distributed species in the circumtropics.

### 97. *Xylosandrus ursulus* (Eggers)

(Fig. 89)

#### 1. *Xyleborus ursulus* Eggers

1923. Eggers, *Zool. Meded.*, **7** : 173. Syntype : Female. Type-locality : Kintamani (Ost Bali, Sundainseln).

#### 2. *Xylosandrus ursulus* (Eggers)

1992. Wood and Bright, *Gt. Basin Nat. Mem.*, No. 13 (Vol.-A) : 801.

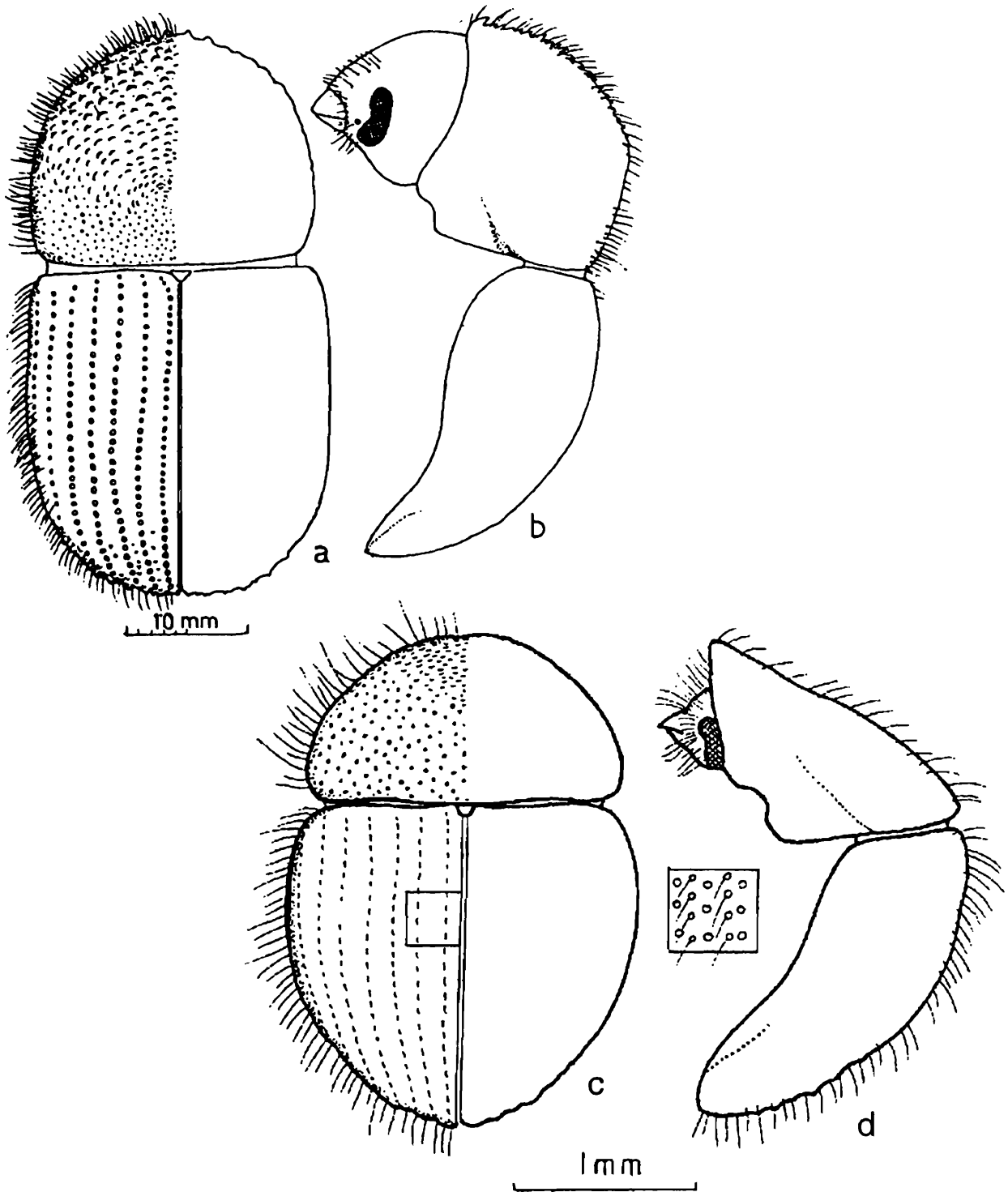
#### 3. *Xylosandrus ursinus* (Hagedorn), Wrong determinations :

1986. Maiti and Saha, *Rec. zool. Surv. India, Occ. Paper* No. 86 : 151-153, fig. 43, a-b.

1996. Saha and Maiti, *State Fauna Series 3 : Fauna of West Bengal, Part 6 (B)* : 836-839.

*Description* : *Female* : Body broad and stout; head blackish brown, pronotum and elytra pitchy black, antennae and legs light brown; body densely hairy. Body length 4.25-4.40 mm, 1.8 times as long as its width.

Frons plano-convex, surface finely reticulate with moderately close, deep scattered punctures and a few long hairs. Eyes comparatively smaller and moderately



**Fig. 89 :** *Xylosandrus ursulus* (Eggers), Female : a, Pronotum and elytra in dorsal view; b, head, pronotum and elytra in lateral view. Male : c, Pronotum and elytra in dorsal view; d, head, pronotum and elytra in lateral view.

emarginate. Antennal scape long and slender; club obliquely truncate, truncated margin very distinct; on anterior face, basal corneous portion reduced with substraight apical margin forming a complete ring being subapical on posterior face indicating a suture; truncated face with two sutures and posterior face unmarked by any suture.

Pronotum globose, 1.23-1.28 times as wide as long, basal margin substraight, with weak median broad emargination; lateral sides moderately outcurved with broadly rounded anterior margin, accommodating 5 median asperities, middle one largest; summit little behind the middle; distinct asperities on anterior declivous two-thirds, gradually larger anteriorly; posterior half with large, deep, close punctures; entire pronotum with dense long hairs.

Scutellum smooth, large and subrounded.

Elytra 1.4 times as long as and nearly as wide as pronotum and nearly as long as its width; basal margin substraight, lateral sides very weakly outcurved with broadly rounded apex, postero-lateral margins without any distinct carina rather with some close either small or large granules; striae with close small shallow punctures, each with a microhair; interstriae flat, much wider than striae with irregular setiferous punctures. Declivity commencing a little before the middle, face weakly convex and gradually sloping posteriorly; striae fairly impressed marked by shallow, comparatively large punctures, each with a microhair; interstriae flat with irregular punctures, sparse granules and long erect dense hair. Procoxae subcontiguous; protibiae with 6 and both meso- and meta-tibiae with 8-9 teeth.

*Male* : Body small and reduced; head, pronotum and elytra blackish brown; entire body moderately hairy. Head concealed under the projection of pronotum, frons convex with hairs; eyes feebly emarginate.

Pronotum projected anteriorly with a weak concavity; basal one-third convex, anterior two-thirds declivous and sloping anteriorly forming concavity before the anterior margin; anterior margin feebly emarginate at the middle; declivous portion with minute asperities, most prominent anteriorly. Elytra convex, basal half convex, anterior half gradually sloping with distinct striae; interstriae weakly convex, with prominent hairs; lateral margins weakly carinate and gradually narrowing posteriorly.

*Distribution* : INDIA : *Nicobar Islands* : Great Nicobar (Campbell Bay) and *West Bengal* : Darjiling Dist., Samsingh. ELSEWHERE : Indonesia, Philippines, Malaysia, Thailand and China.

*Hosts* : *Sterculia colorata*, *Casearia glomerata* and *Castanopsis* sp.

*Remarks* : The species is very stout and strong with profuse pilosity. Until its recent record from the mainland of India (Saha and Maiti, 1996 as *Xylosandrus ursinus*), it was known only from the insular areas of the Orient including Nicobar Island.

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## TAXONOMIC INDEX

The names of the higher taxa (in bold letters) including the genera are primarily arranged alphabetic order and then the species under each genera are arranged so. The names of the genera mentioned against the species name indicate its previous status. The names of the synonyms of genera and species are written in italics, while the valid ones are given in regular type.

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