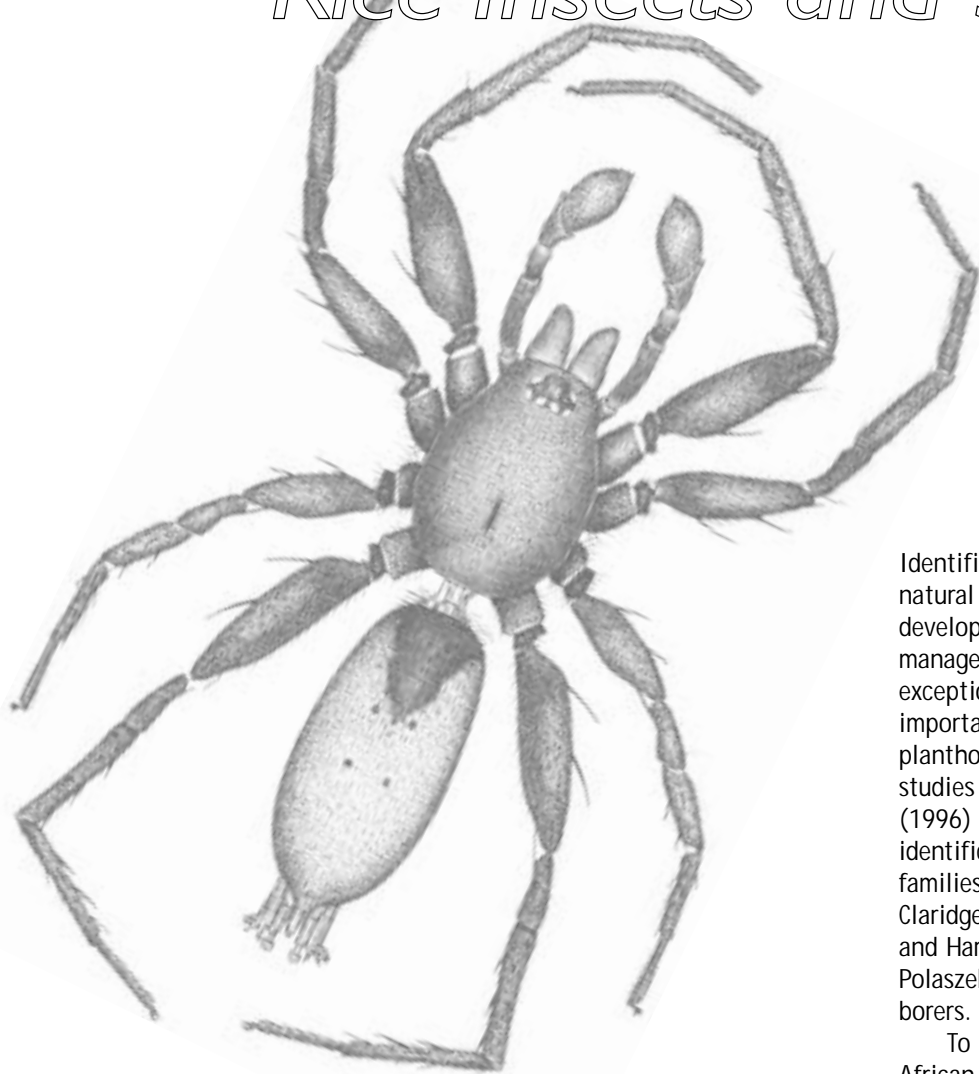


# **An Illustrated Key**

## **to the Identification of Selected West African *Rice Insects and Spiders***



Identification of rice insect pests and their associated natural enemies is often a limiting factor in the development of a comprehensive insect pest management strategy in West Africa. Notable exceptions, however, are three groups of economically important rice pests—stem borers, leafhoppers and planthoppers, and gall midges for which full taxonomic studies are available to date. Meijerman and Ulenberg (1996) made an excellent contribution to the identification of African stem borer larvae from the families Pyralidae and Noctuidae, while Wilson and Claridge (1991) dealt on leafhoppers and planthoppers, and Harris and Gagne (1982) studied gall midges. Polaszek (1992) treated the parasitoids of cereal stem borers.

To assist the national research systems of 17 West African countries that are collaborating with WARDA to identify specimens in their own collections, we have developed an illustrated key for parataxonomists (high school or college graduates without formal training in entomology and taxonomy). This key provides illustrations for 275 species of insects (Section II) and 69 species of spiders (Section III), which are associated with the rice agroecosystems. Although we tried to be comprehensive, the lack of good specimens, especially for the flies, thrips, chalcidoids, scellionids, and spiders, on which to base the illustrations has limited our coverage of the wide diversity of insects and spiders that abound in the rice agroecosystems. This illustrated key was based solely on a general

collection brought to IRRI by Dr. E.A. Heinrichs and Mr. Traore Abdoul Kassoum Aboubakar in 1994 and 1995, respectively. Many common and dominant species of insect pests and beneficial species not represented in the general collection were not included. Nevertheless, we still hope the key will be useful in identifying and understanding the components of the arthropod community in West Africa's rice agroecosystems.

## Section I: Orders based on adults

1	Body with 3 pairs of legs, 3 body segments (head, thorax , and abdomen) and 2 pairs of wings [Insects] .....	2
1'	Body with 4 pairs of legs, 2 body segments (cephalothorax and petiolate abdomen) and wingless [Spiders] .....	<b>Araneae</b>
2	Wings, body, and legs covered with scales .....	<b>Lepidoptera</b>
2'	Wings, body and legs without scales .....	3
3	Fore wings and hind wings subsequently elongated, membranous and multiveined, each wing with a node and a pterostigma; eyes large, occupying most of the transverse head; antennae small and bristle-like .....	<b>Odonata</b>
3'	Fore wings and hind wings without nodes and pterostigma; eyes and antennae not as above .....	4
4	Cerci present .....	5
4'	Cerci absent .....	7
5	Cerci forcep-like, unsegmented and sclerotized, dorsoventrally flattened insects with telescopic and mobile abdomen .....	<b>Dermaptera</b>
5'	Cerci not forcep-like, segmented and not sclerotized; not dorsoventrally flattened insects; abdomen not telescopic .....	6
6	Front legs normal; hind legs saltatorial with enlarged femora; tarsi 3–4 segmented .....	<b>Orthoptera</b>
6'	Front legs raptorial; hind legs normal, slender and adapted for walking; tarsi 5-segmented .....	<b>Mantodea</b>
7	Fore wings reduced to knob-like structures; flabellate antennae 4–7 segmented .....	<b>Strepsiptera</b>
7'	Fore wings not knob-like; antennae not flabellate .....	8
8	Hind wings reduced to knob-like structures (halteres); one pair of membranous fore wings present .....	<b>Diptera</b>
8'	Hind wings not knob-like .....	9
9	Fore wings modified into hardened and rigid elytra covering the membranous hind wings; antennae 11-segmented or less .....	<b>Coleoptera</b>
9'	Fore wings not forming a rigid elytra; antennal segments variable .....	10

- 10 Mouthparts piercing-sucking type forming a segmented beak; wings without hamuli; fore wings either membranous or thickened and leathery with membranous apical portion ..... **Hemiptera**
- 10' Mouthparts mandibulate; wings with hamuli and reduced venation ..... **Hymenoptera**

## Section II: Insects

### Order Lepidoptera

*Skipper butterflies, noctuid and pyralid moths*

- 1 Antennae widely separated at base, flagellum thickens distally forming a club and hooked tips; ocelli absent; haustellum naked; maxillary palpi absent; retinaculum and frenulum absent; fore wings each with 10 transparent or white spots, none in hind wings (**Fig. 83**); medium-sized butterflies with dull brown body and wings; larvae defoliators [Family **Hesperiidae**] ..... *Parnara* sp.
- 1' Antennae near each other basally, distal end not clubbed and hooked at tips; ocelli maybe present or absent; haustellum very reduced, well developed or scaly; maxillary palpi 1–4 segmented; retinaculum and frenulum present; forewings pattern variable; larvae stem borers and defoliators ..... 2
- 2(1') Heavy-bodied pink stem borer moths with a thick tuft of hairs on thoracic dorsum (**Figs. 84, 85**); narrowed fore wings yellowish red with slight dusky suffusion, fringe ochreous white and pale infuscate medially and distally, postmedial mark brownish gray; hind wings broadened, vein M1 rudimentary; proboscis strong, maxillary palpi 1-segmented; labial palps not strongly porrect; tibiae II and III spineless; larvae stem borers (note: wing markings easily lost in old specimens) [Family **Noctuidae**] ..... *Sesamia calamistis* Hampson
- 2' Moderately small, delicate and slender-built moths without thick hair tuft in thorax; fore wings elongate to subtriangular, markings variable; hind wings usually broad; proboscis very reduced to scaly, maxillary palpi 4-segmented; labial palps strongly porrect, beak-like; tibiae II and III usually with spines; larvae stem borers and defoliators [Family **Pyralidae**] ..... 3
- 3(2') White moths with or without brown spots on both wings ..... 4
- 3' Yellowish brown or straw-colored moths ..... 5
- 4(3) Wings immaculate to bright white with light yellowish brown and dark brown spots and tuft weakly developed; all legs dull white; commonly known as rice caseworm ..... *Nymphula depunctalis* (Guenée) [**Fig. 86**]
- 4' Both wings immaculate white except light gray costal area ventrally; anal hair tuft thick and shiny yellowish white; all legs yellowish white; white stem borer ..... *Scirpophaga* sp. [**Fig. 87**]
- 5(3') Fore wings with a dark brown to reddish brown longitudinal band parallel to the costal margin; tornus rounded upwards; fore- and hind wings without vein M3, median nervure with only three veins; whitish hind wings with metallic luster and long fringed hairs; proboscis poorly developed; rice stem borer ..... *Maliarpha separatella* Ragonot [**Fig. 88**]

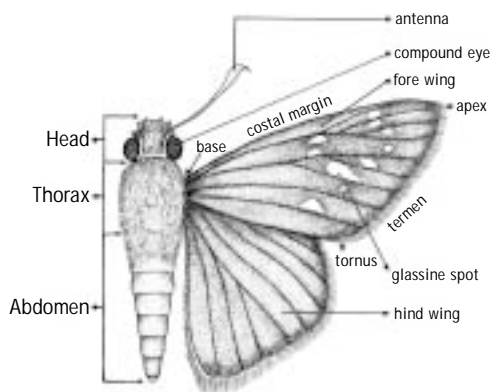
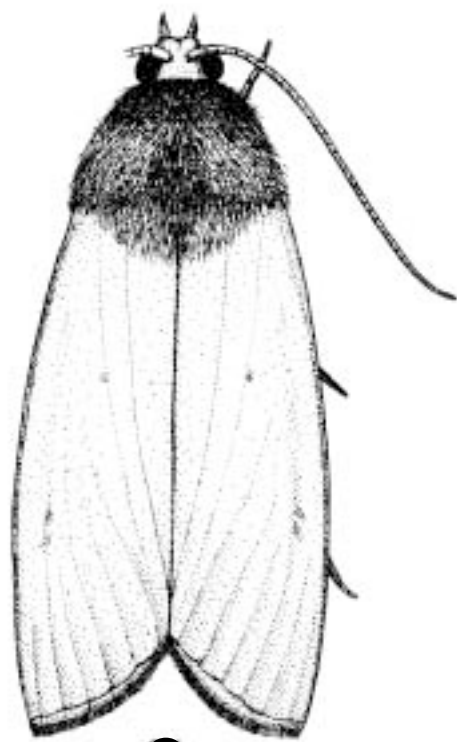


Fig. 83. *Parnara* sp., dorsal view (2.6X).



Fig. 86. *Nymphula depunctalis* (Guenée), dorsal view (8.5X).



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Figs. 84–85. *Sesamia calamistis* Hampson, dorsal (84; 7.7X), and lateral views of head and thorax (85; 11X).

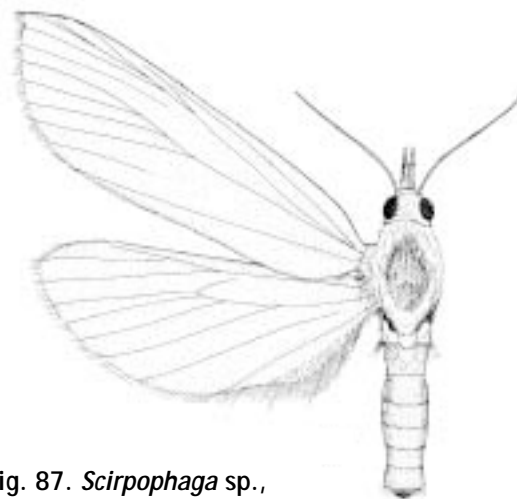


Fig. 87. *Scirpophaga* sp., dorsal view (5.33X).



Fig. 88. *Maliarpha separatella* Ragonot, dorsal view (5.1X).

- 5' Fore wings with different color and markings ..... 6
- 6(5') Fore wings and hind wings brownish yellow becoming darker towards the apical margins; fore wings with two short subbasal bands not reaching the costal margin, a short and two complete medians and two subterminal dark brown narrow bands; hind wings with three bands only; larva folds leaves, rice leaf folder ..... *Marasmia trapezalis* (Guenée) [Fig. 89]
- 6' Ochreous yellow moths without transverse bands; larva bores rice stems producing deadhearts and whiteheads on the plant ..... 7
- 7(6') Face conical with a distinct point; labial palps 3–3.5 times as long as diameter of eye; fore wings yellow brown with a dull brown spot and dusted with fuscous scales; subterminal line light brown; vein M1 of hind wings arises from Rs before the angle of cell; harpe with a strong median tooth in the costal margin and juxta bell-shaped with two basal notches in the male genitalia ..... *Chilo partellus* (Swinhoe) [Figs. 90, 91]
- 7' Face rounded without a corneous point ..... 8
- 8(7') Fore wings ochreous yellow, length 10–14 mm and wing span 20–24 mm; ocelli small yet distinct; vein R1 of front wings runs together with Sc; subterminal line indistinct in both sexes; hind wings dull ochreous yellow; aedeagus without ventral arm; juxta without tooth; harpe tapers apically ..... *Chilo zacconius* Bleszynski [Fig. 92]
- 8' Fore wings orange yellow to dirty yellow, length 8–13 mm, and wing span 16–26 mm; ocelli well developed; vein R1 of front wings free; subterminal line distinct in male, reduced in female; hind wings grayish cream to silky white with luster; aedeagus curved basally with a short ventral arm; arms of juxta bear a subapical tooth; harpe widely blunt apically ..... *Chilo diffusilineus* (J. de Joannis) [Figs. 93, 94]

## Order Diptera

### *African rice gall midge and stalk-eyed flies*

- 1 Eyes not on a stalk; fore wings with very few longitudinal veins reaching wing margin; costa running around wing margin with reduced venation, longitudinal vein Rs unbranched, discal cell absent; antennae more than 10 segments with bead-like joints; maxillary palpi 3-segmented; anterior margins of abdominal tergites VII and VIII with narrow irregular pigmented bands; hypoproct slightly notched in apical end; gonostyle slightly tapered in apical one-third [Family **Cecidomyiidae**] ..... *Orseolia oryzivora* Harris & Gagne [Figs. 95–97]
- 1' Eyes on a stalk, widely separated from each other [Family **Diopsidae**] ..... 2
- 2(1') Apex of fore wings uniformly transparent without any spot; scutellum and spines brownish yellow; wing span 14–15 mm ..... *Diopsis longicornis* Macquart [Fig. 98]
- 2' Apex of fore wings with a large black spot; scutellum blackish brown and scutellar spines brown except black apical one-half; wing span 8–12 mm ..... *Diopsis apicalis* Dalman [Fig. 99]

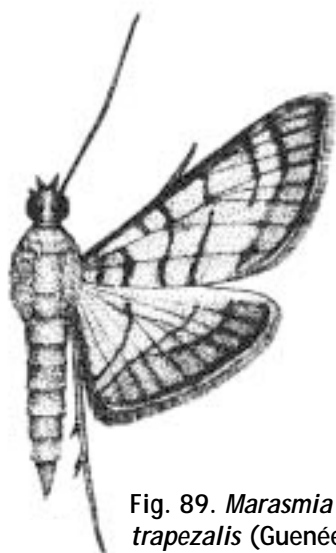


Fig. 89. *Marasmia trapezalis* (Guenée), dorsal view (5.83X).

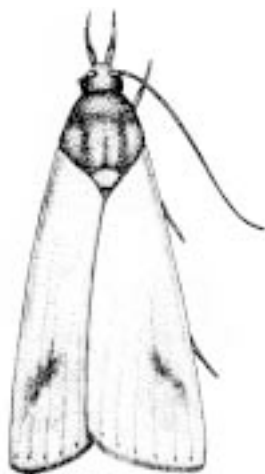
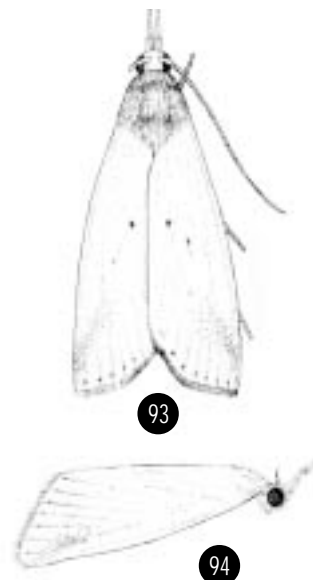


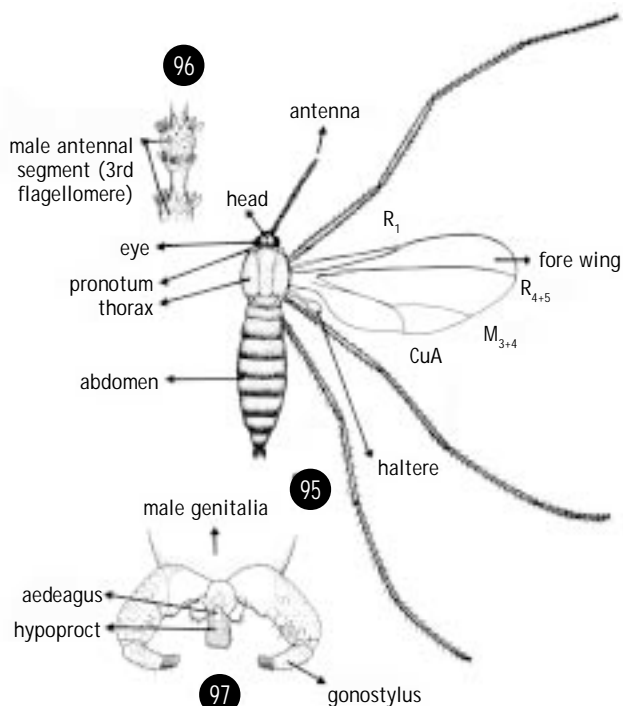
Fig. 92. *Chilo zacconius* Bleszynski, dorsal view (3.6X).



Figs. 93–94. *Chilo diffusilineus* (J. de Joannis), dorsal (93; 5.25X), and lateral (94; 4.53X) views.



Figs. 90–91. *Chilo partellus* (Swinhoe), dorsal view at rest position (90; 5.82X) and right wings spread (91; 3.22X).



Figs. 95–97. *Orseolia oryzivora* Harris and Gagne, dorsal view of adult (95; 7X), male antennal segment (96; 6.6X), and male genitalia (97; 35X).

## Order Odonata

### *Dragon- and damselflies*

- 1 Wings held horizontally at rest, unstalked basally; hind wings widened towards base, more triangular than fore wings; both pairs of wings yellow with longitudinal black bands not reaching distal ends, lower ends of bands indented medially; discoidal cell triangular; antenodal cross veins (Ax) more than two; thickened antenodal cross vein absent; eye without lateral projection; terminal abdominal segment with one pair of upper and a single lower appendages above anus; small libellulids with a wing span of 40–45 mm; dragonflies [Family **Libellulidae**] ..... *Palpopleura* sp. [Fig. 100]
- 1' Wings held closed or half open at rest, stalked basally; fore- and hind wings equally long, similar in shape without longitudinal black bands; discoidal cell with unequal sides; only 2 antenodal cross veins present; terminal abdominal segment with two pairs of appendages above anus ..... 2
- 2(1') Wings divergent above body when at rest; long pterostigma elongate brown to rectangular, 2 or more cells long; postnodal cross veins about 11; third radius (R3) arises from R2 below third postnodal cross vein (Px3); intermediate radial veins 3 and 4 closer to arculus than nodus; upper terminal abdominal appendages forcep-like; spread-winged damselflies [Family **Lestidae**] ..... *Lestes* sp. [Fig. 101]
- 2' Wings held closed together above body at rest; pterostigma short, rhomboidal, approximately one cell long; postnodal cross veins 10 or less; R3 arises from R2 below middle of postnodal cross vein Px4 and Px5; intermediate radial veins 3 and 4 closer to nodus than arculus; upper terminal abdominal appendages not forcep-like; narrow-winged damselflies [Family **Coenagrionidae**] ..... 3
- 3(2') Arculus located at a point nearly midway between the first antenodal (Ax1) and nodus; vein M2 arises below postnodal cross vein 3 (Px3); Fore wings with 7 postnodal nodes each; pterostigma obliquely rectangular in both wings; posterior lobe of prothorax without a pair of porrect spines; 8th abdominal sternite without median spine in female; labrum broadly rounded; anteclypeus convex medially ..... *Agriocnemis* sp. [Figs. 102–104]
- 3' Arculus only slightly nearer to the level of first antenodal (Ax1); vein M2 arises approximately below postnodal cross vein 7 (Px7); Fore wing with 14 postnodal nodes each; pterostigma narrowly subquadrate; similar in size and shape in both wings; female prothorax with a pair of small porrect spines in the posterodorsal lobe; labrum strongly convex; anteclypeus straight ..... *Pseudagrion* sp. [Figs. 105–107]

## Order Dermaptera

### *Earwigs*

- 1 Antennae with 16 segments; head, thorax, and abdomen black; pronotum wider behind than in front, slightly indented at lateral midhalf; forceps close basally, short and stout, apically curved overlapping each other and inner sides with little serrations; terminal abdominal segment not serrated posteriorly [Family **Labiduridae**] ..... *Euborellia annulipes* (Lucas) [Fig. 108]
- 1' Antennae with about 22 segments; thorax and abdomen yellow and brown; pronotum and elytra yellow with parallel sides and a pair of dark brown longitudinal bands; forceps long and slender, widely separated basally, inner half with a small tooth; terminal abdominal segment with about 4 teeth posteriorly [Family **Labiduridae**] ..... *Labidura riparia* Pallas [Fig. 109]



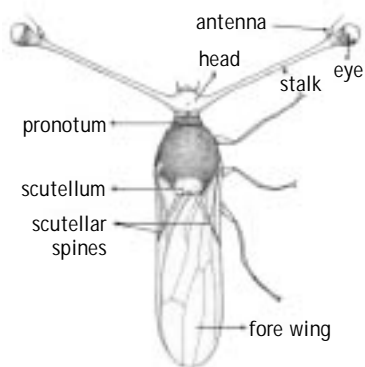


Fig. 98. *Diopsis longicornis* Macquart, dorsal view (5.83X).

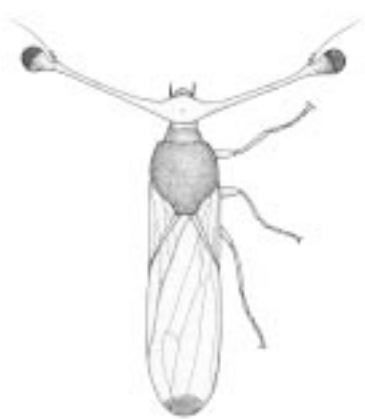


Fig. 99. *Diopsis apicalis* Dalman, dorsal view (6.7X).

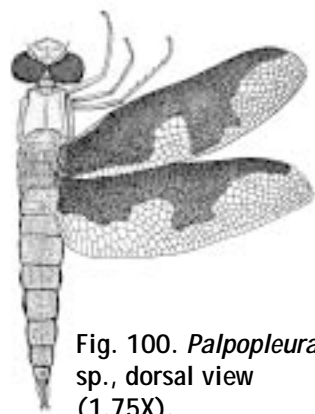


Fig. 100. *Palpopleura* sp., dorsal view (1.75X).

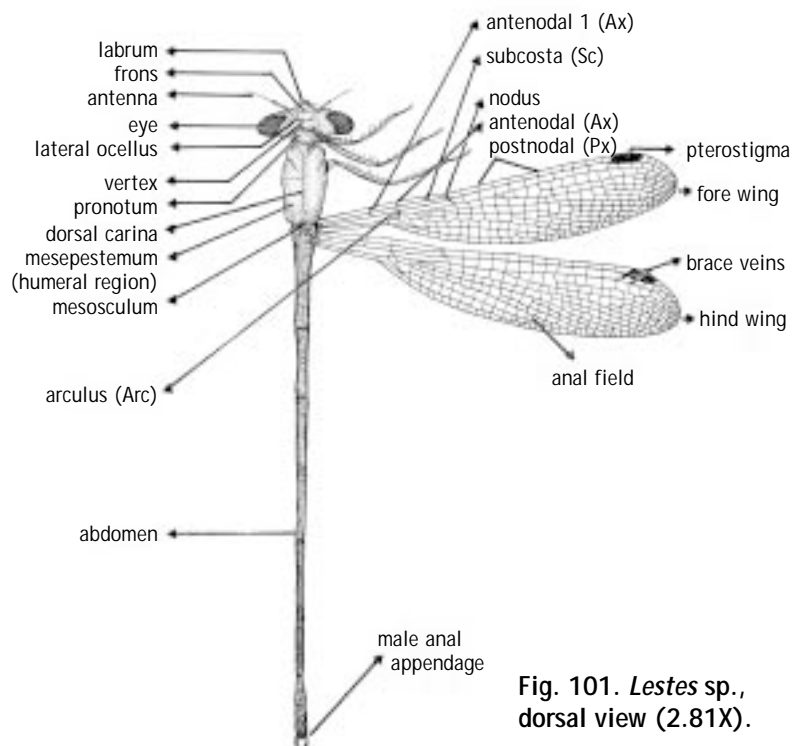
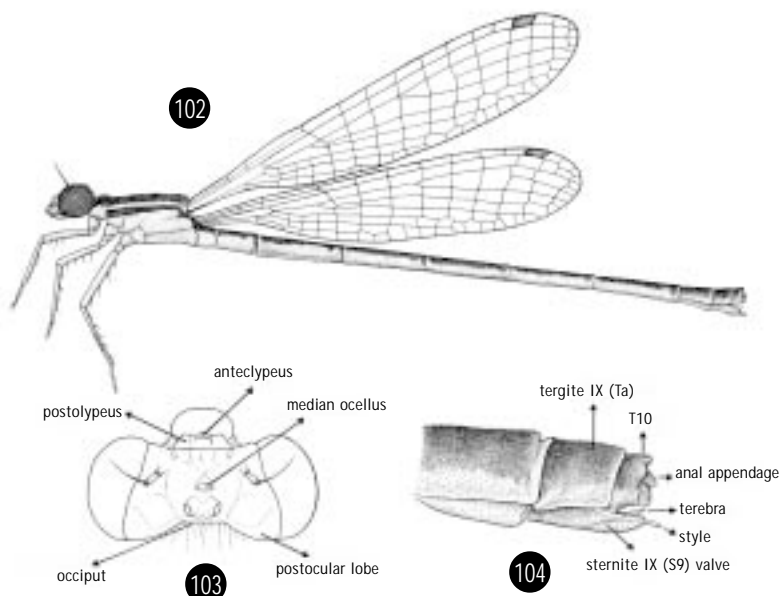
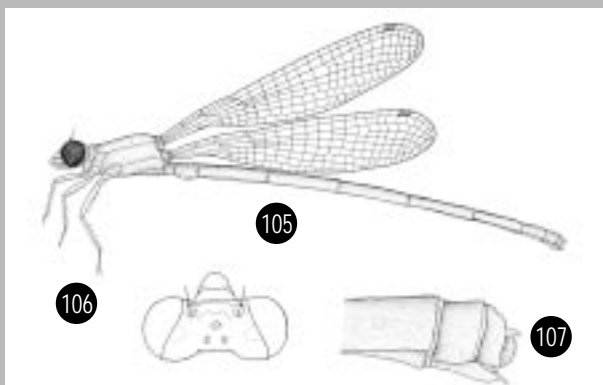


Fig. 101. *Lestes* sp., dorsal view (2.81X).



Figs. 102–104. *Agriocnemis* sp., lateral view (102; 4.9X), dorsal view of head (103; 14X), and lateral view of abdominal tip (104; 12X).





Figs. 105–107. *Pseudagrion* sp., lateral view (105; 2X), dorsal view of head (106; 4.5X), and lateral view of abdominal tip (107; 5.78X).

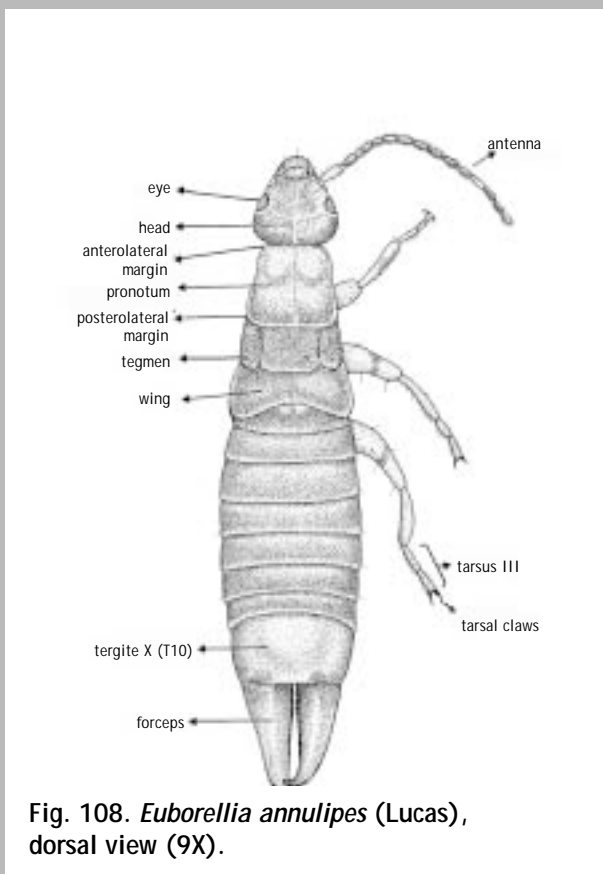


Fig. 108. *Euborellia annulipes* (Lucas), dorsal view (9X).

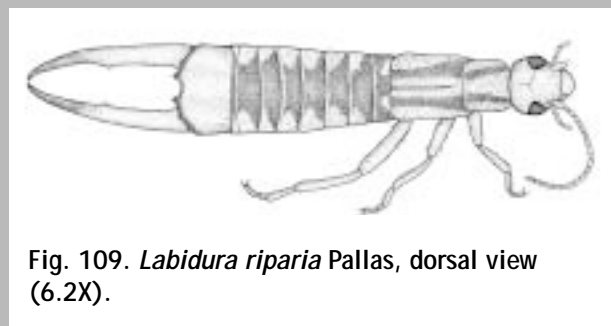


Fig. 109. *Labidura riparia* Pallas, dorsal view (6.2X).

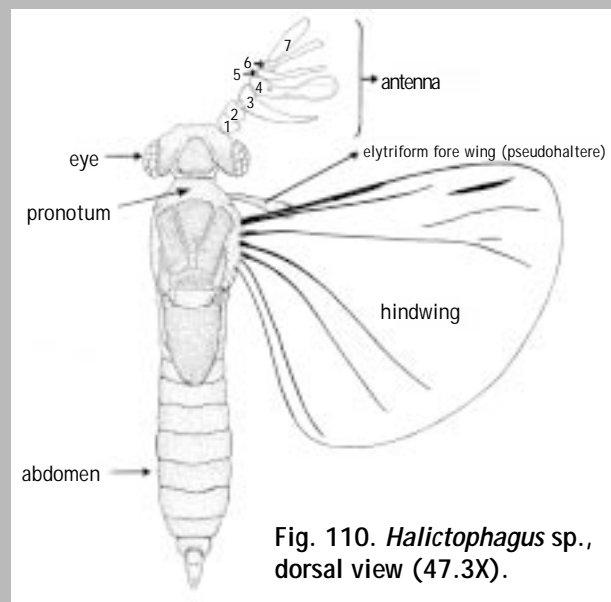


Fig. 110. *Halictophagus* sp., dorsal view (47.3X).

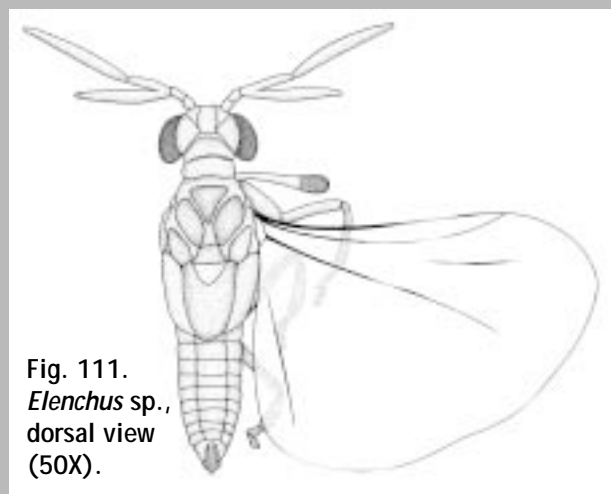


Fig. 111. *Elenchus* sp., dorsal view (50X).

## Order Strepsiptera

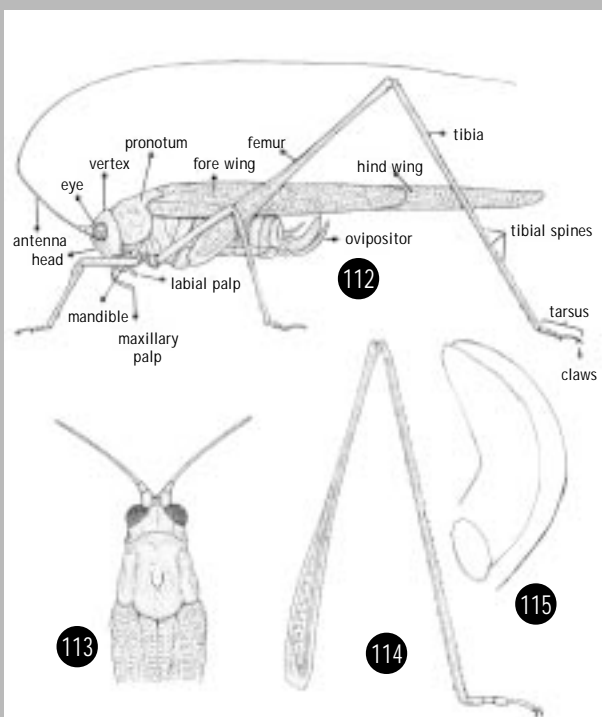
*Twisted-winged flies*

- 1 Tarsi 3-segmented; antennae 7-segmented with segments III–VI flabellate and segment IV robust; veins MA2, CuA1, and CuA2 very prominent; parasitic on leafhoppers [Family **Halictophagidae**] ..... *Halictophagus* sp. [Fig. 110]
- 1' Tarsi 2-segmented; antennae 4-segmented with flabellate 3<sup>rd</sup>; veins MA2 and CuA1 absent, only CuA2 present in the bottom half of the hind wing; parasitic on planthoppers [Family **Elenchidae**] ..... *Elenchus* sp. [Fig. 111]

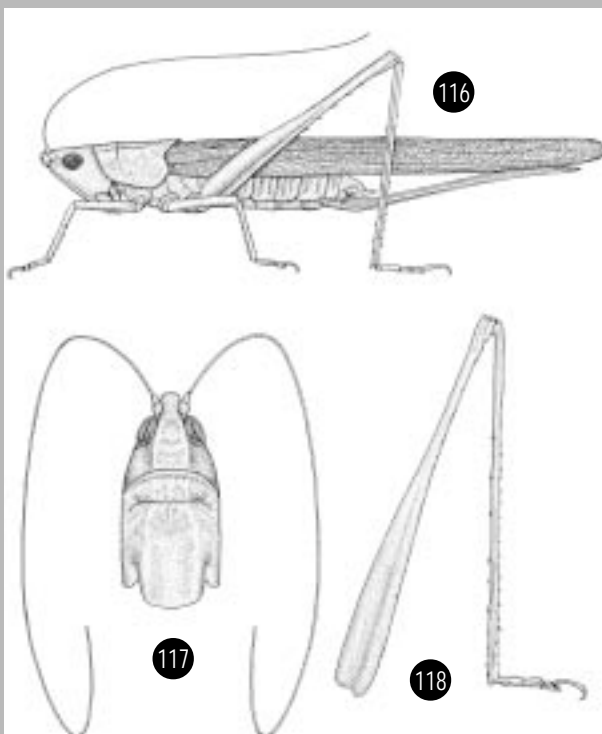
## Order Orthoptera

*Grasshoppers, locusts, and crickets*

- 1 Antenna very long, more than 30 segments, extended well beyond tip of abdomen; tarsus 3-4 segmented; foreleg fossorial or for walking ..... 2
- 1' Antenna short, less than 30 segments, never reaches tip of abdomen; tarsi 3-segmented or tarsi I and II 2-segmented and tarsus III 3-segmented ..... 8
- 2(1) Tarsus 4-segmented; Fore wing tough and leathery; venter of tibiae I and II without articulated spines [Family **Tettigoniidae**] ..... 3
- 2' Tarsus 3-segmented ..... 6
- 3(2) Anterior of head without a protruding process extended to at least two-thirds of scape; fore wing green, not reaching the hind knee, one-third shorter than hind wing; Fore wing length/hind femur length ratio less than 1.1; lateral pronotal lobe as long as deep; femur III without ventral spines; tibia III with 41 external dorsal spines; female ovipositor broad and upwardly curved, serrated dorsally except basal one-third; body length 25 mm ..... *Phaneroptera nana sparsa* Stål [Figs. 112–115]
- 3' Anterior tip of head snout-like; Fore wings extended beyond the hind knee; tibia III and femur III with ventral spines ..... 4
- 4(3') Snout-like process on tip of head blunt, as long as wide and extending beyond scape; eyes ovoid as seen dorsally; pronotum flat dorsally behind the transverse groove in the anterior one-third; posterior margin strongly concave, lateral side of pronotum much longer than deep and rounded along ventral margin; fore wings as long as hind wings; femur III as long as ovipositor; tibia III with at least 21 dorsal and 10 ventral external spines; body length 42 mm ..... *Ruspolia differens* Audinet-Serville [Figs. 116–118]
- 4' Snout-like process constricted at midhalf and knob-like at tip ..... 5
- 5(4') Dorsum of head and pronotum with a reddish-brown longitudinal band, broad posteriorly and narrows anteriorly; snout-like process moderately constricted at midhalf; basal segments of antenna with reddish brown mottles; Fore wings brownish basally; femur and tibia with reddish brown dots; body length 21 mm ..... *Conocephalus maculatus* Le Guillou [Fig. 119]
- 5' Dorsum of head and pronotum green (yellow brown in alcohol-preserved specimens) without a reddish longitudinal band; snout-like process distinctly constricted at midhalf; basal antennal segments without reddish brown mottles; fore wing uniformly green; femur and tibia uniformly yellowish brown; body length 27 mm ..... *Conocephalus conocephalus* Linnaeus [Figs. 120–122]



Figs. 112–115. *Phaneroptera nana sparsa* Stal, lateral view of adult (112; 2.1X), dorsal view of head and pronotum (113; 4.2X), lateral view of leg III (114; 2.58X), and cercus (115; 10X).



Figs. 116–118. *Ruspolia differens* Audinet-Serville, lateral view of adult (116; 1.63X), dorsal view of head and pronotum (117; 6.5X), and lateral view of leg III (118; 2.3X).

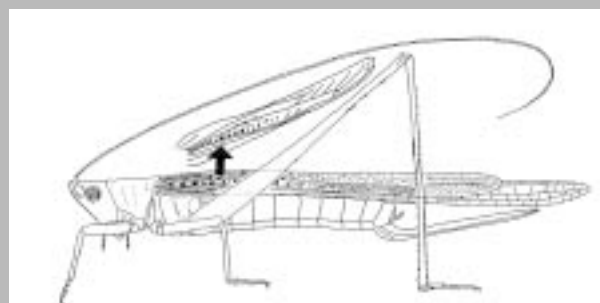
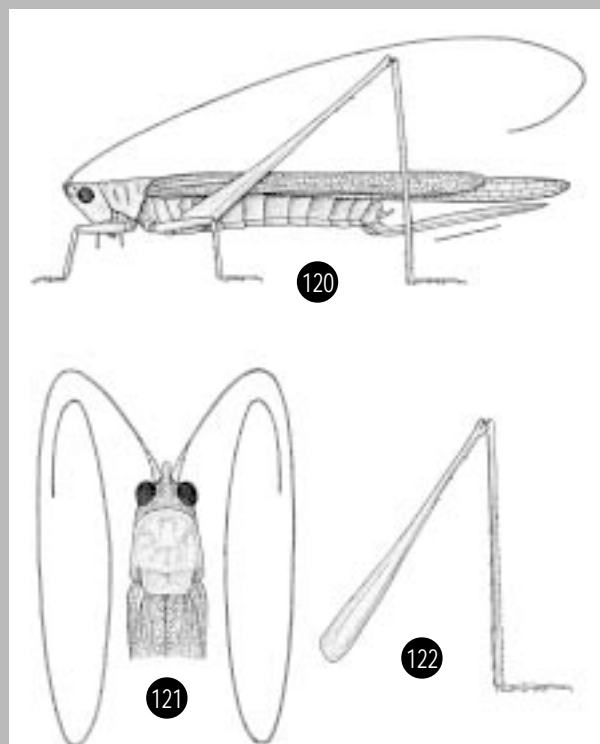
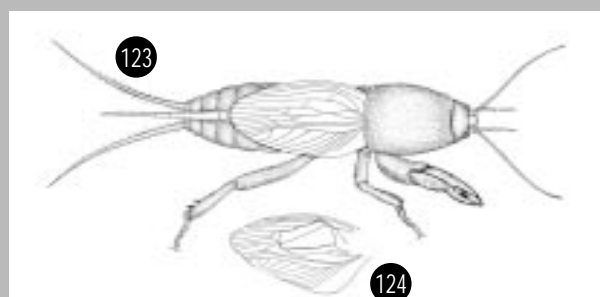


Fig. 119. *Conocephalus maculatus* (Le Guillou), lateral view (2.9X).



Figs. 120–122. *Conocephalus conocephalus* Linnaeus, lateral view of adult (120; 2.33X), dorsal view of head and pronotum (121; 6X), and lateral view of leg III (122; 2.7X).



Figs. 123–124. *Gryllotalpa africana* Palisot de Beauvois, dorsal view (123; 2.35X) and male fore wing (124; 2.4X).

6(2')	Foreleg modified for digging (fossorial type); femur and tibia of leg I flat; femur I with a basal spur; fore tibia with 4 large teeth; tarsus I with 2 fan-like teeth; veins R1 and Rs distally separated; harpe of male fore wing almost rectangular; genitalia very large, ventral processes long; generally pale brown; body length 28.4 mm [Family <b>Gryllotalpidae</b> ] ..... ..... <i>Gryllotalpa africana</i> Palisot de Beauvois [Figs. 123, 124]	
6'	Foreleg normal, adapted for walking .....	7
7(6')	Small black cricket, 4.5–7.0 mm long; head somewhat triangular from vertex to anterior tip, without a transverse ridge connecting eyes anteriorly, subquadrate plate between antennal base; pronotum as long as wide, lateral margin straight; antenna yellow except black scape and pedicel; fore wing longer than hind wing with a pointed apicoinner tip, veins mostly longitudinal and parallel to each other; cercus yellow with long hairs and clubbed setae in inner basal one-third; leg black with an apicoventral spine in tibia I; ovipositor very short .....	<i>Metioche</i> sp. [Fig. 125]
7'	Slender brownish yellow to dark brown cricket, 18 mm long; head somewhat transverse with three broad longitudinal bands, a transverse ridge connects two eyes anteriorly; vertex subquadrate, blunt anteriorly and as low as mid-eye level; pronotum with a broad dark brown median longitudinal band extended to fore wing faded brown; propleuron with a thin pale brown longitudinal band extended to temple, lower margin broader in anterior one-half; antenna pale yellow brown with dark brown venter of scape and pedicel; Fore wing much shorter than the hind wing, squarish cells brownish, apical margin rounded; cercus yellow and hairy; leg yellowish with 10–11 external and 12 internal long dorsal spines in tibia III .....	<i>Euscyrtus bivittatus</i> (Guerin-Meneville) [Figs. 126–128]
8(1')	All tarsi 3-segmented .....	9
8'	Tarsi I and II 2-segmented, tarsus III 3-segmented .....	19
9(8)	Fastigium of vertex lacks a midlongitudinal sulcus anteriorly [Family <b>Acrididae</b> ] .....	10
9'	Fastigium of vertex with a mediolongitudinal sulcus extended posteriorly for a short distance from its anterior extremity [Family <b>Pyrgomorphidae</b> ] .....	16
10(9)	Dense stridulatory veinlets in radial area of tegmen parallel and regular; fastigium of vertex wider than long, shallow cavity in front of a bow-shaped transverse furrow, apex moderately rounded to angular; antenna with 27–28 segments; pronotum with three transverse furrows dorsally, anterior not extended to the laterals unlike 2nd and 3rd furrows; posterior one-third of propleuron densely punctated similar to meso- and metapleuron; prosternal process conical; tegmina and wings extended beyond abdominal tip; femur III moderately robust with 12–13 laterally concave or widely V-shaped striae present ; upper external femoral lobe black extended to base of yellow lower lobe of knee; tibia III with 10 spines each in inner and outer rows; cerci downcurved at tip laterally and incurved dorsally; body length 27 mm .....	<i>Hieroglyphus africanus</i> Uvarov [Figs. 129, 130]
10'	Elytron without stridulatory veins from the radial area .....	11
11(10')	Prosternal process absent .....	12

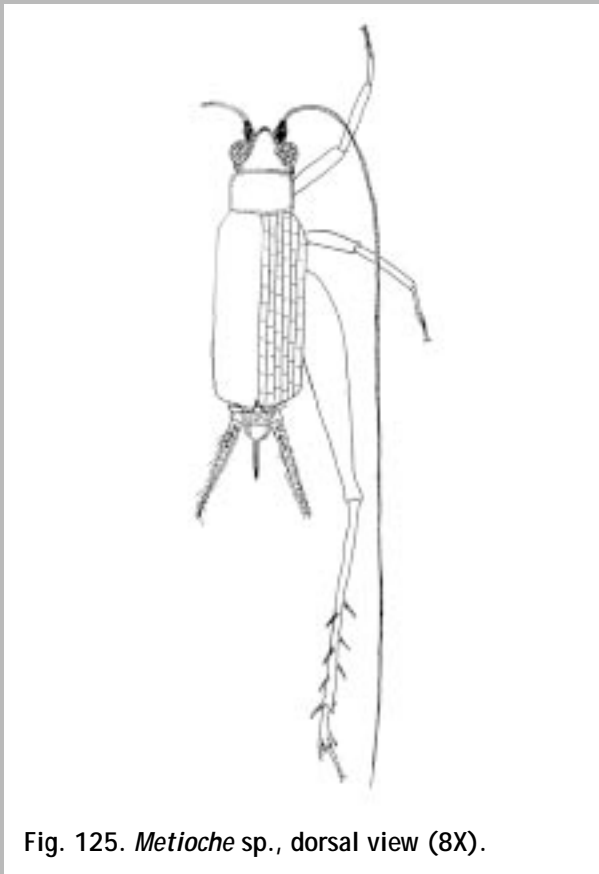


Fig. 125. *Metioche* sp., dorsal view (8X).

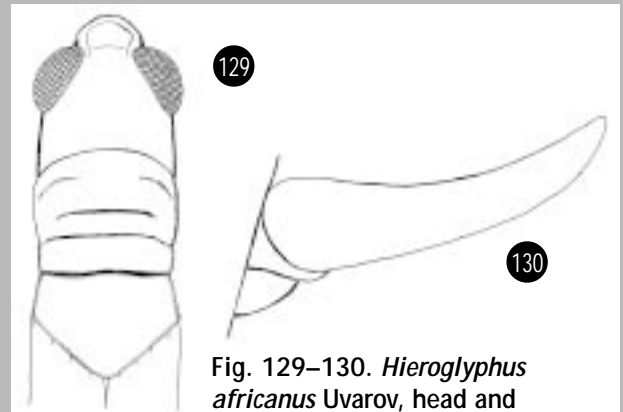


Fig. 129–130. *Hieroglyphus africanus* Uvarov, head and pronotum (129; 4.9X) and cercus (130; 17.3X).

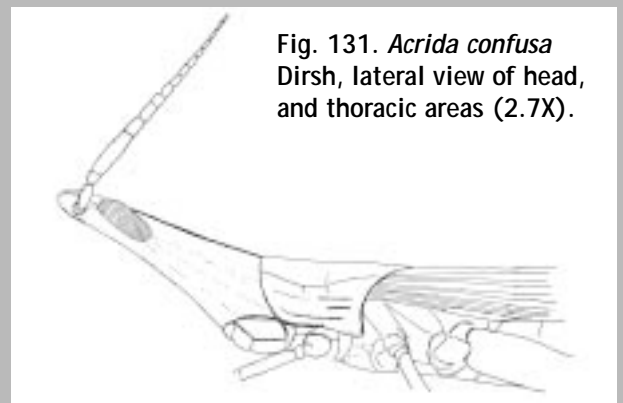
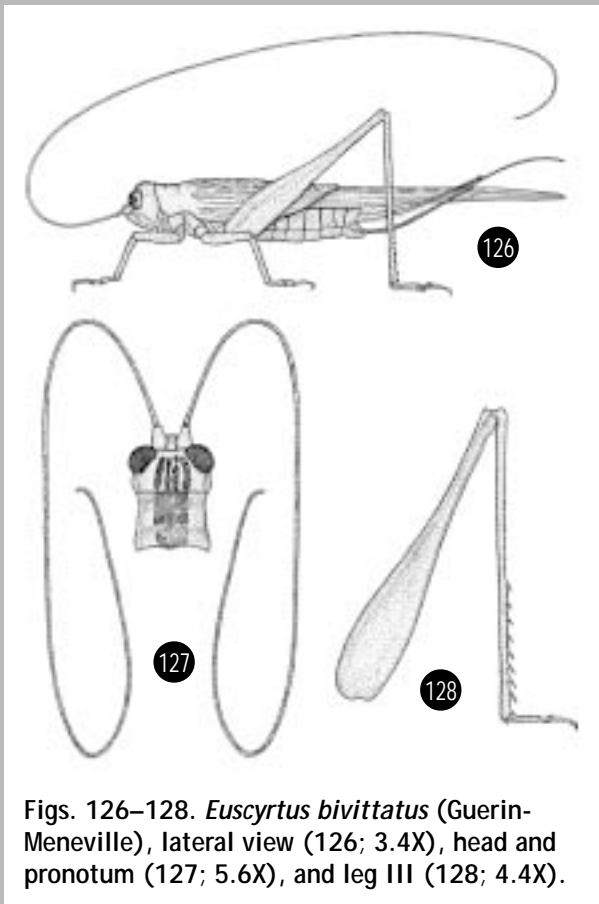


Fig. 131. *Acrida confusa* Dirsh, lateral view of head, and thoracic areas (2.7X).



Figs. 126–128. *Euscyrtus bivittatus* (Guerin-Meneville), lateral view (126; 3.4X), head and pronotum (127; 5.6X), and leg III (128; 4.4X).

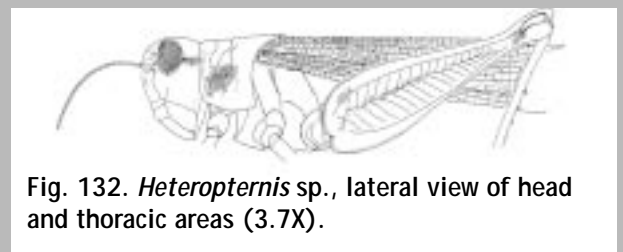
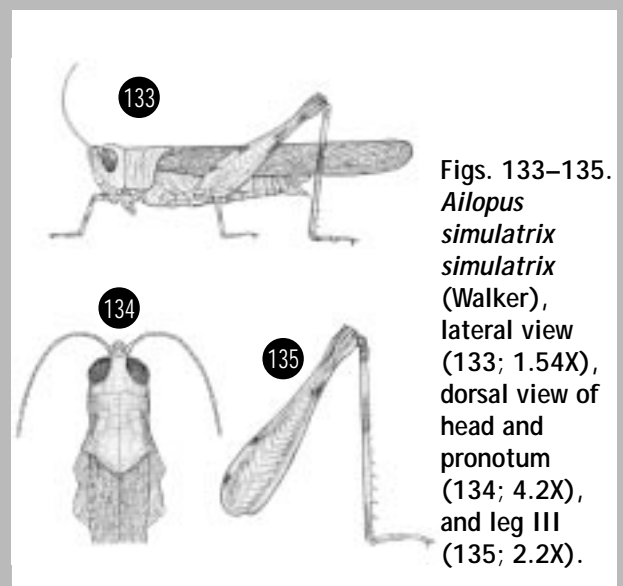
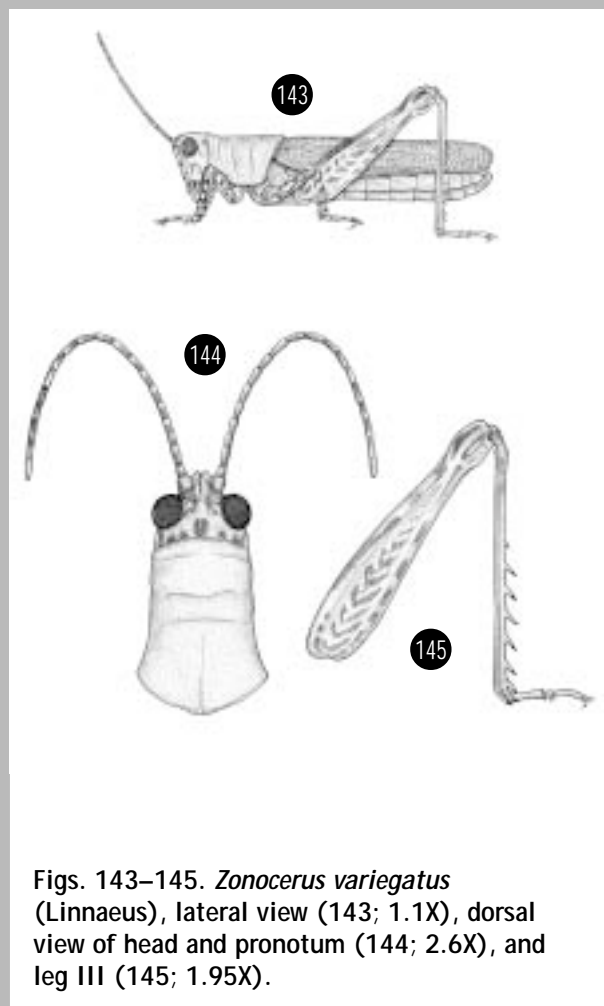
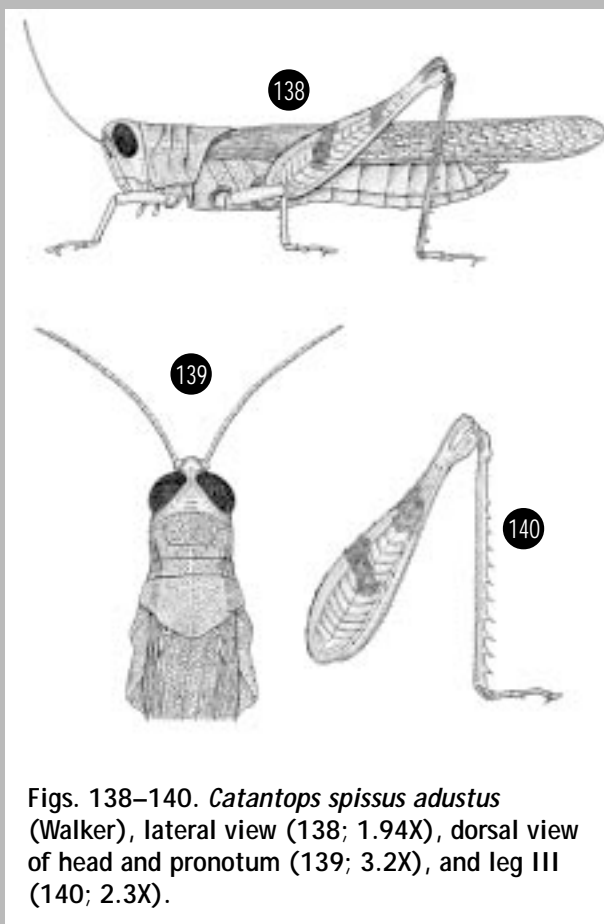
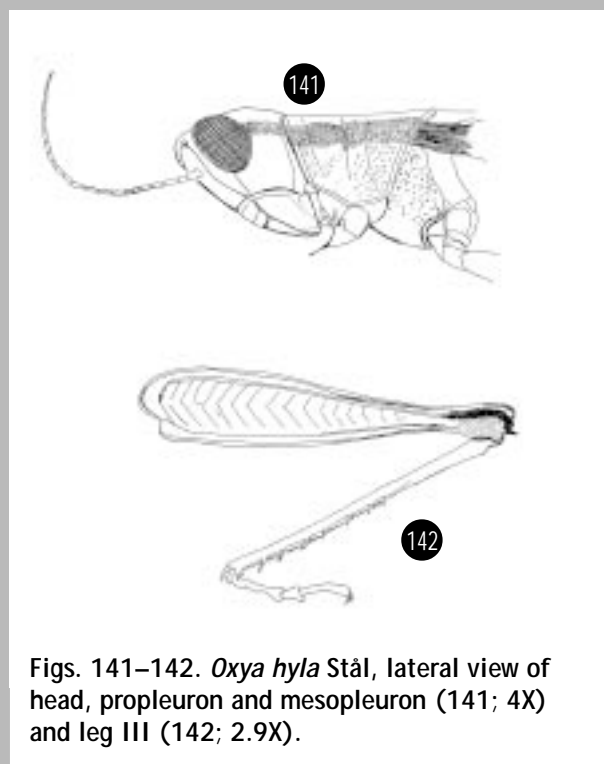
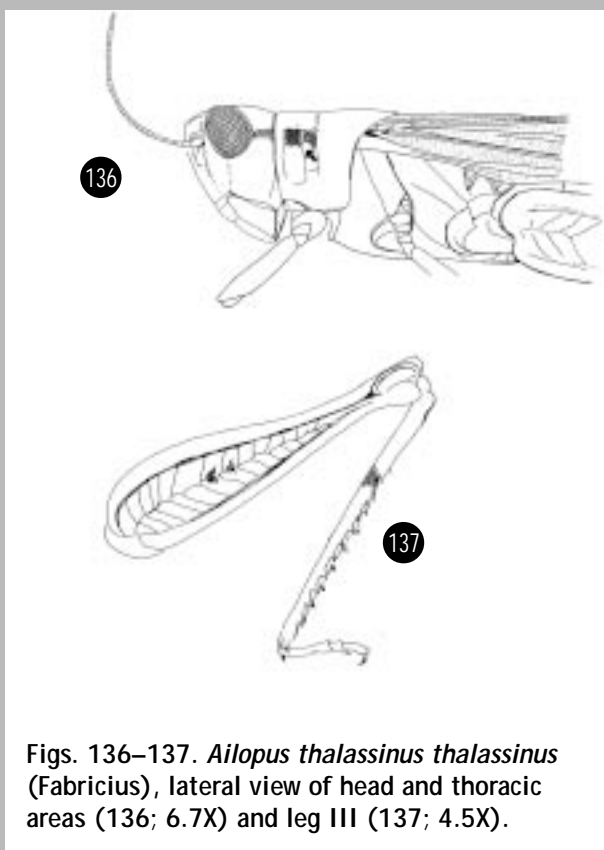


Fig. 132. *Heteropternis* sp., lateral view of head and thoracic areas (3.7X).



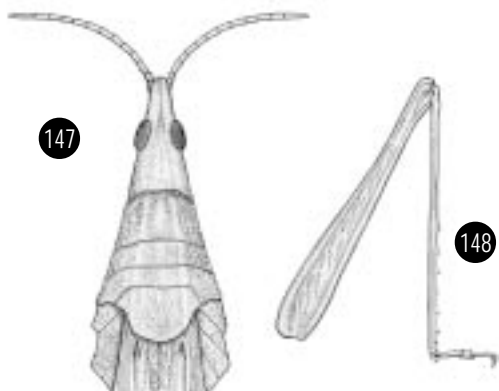
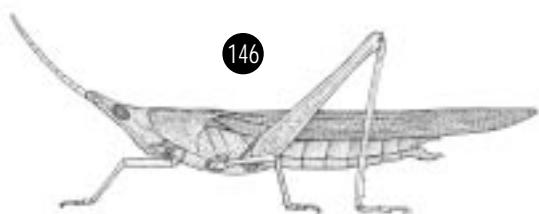
Figs. 133–135. *Ailopus simulatrix simulatrix* (Walker), lateral view (133; 1.54X), dorsal view of head and pronotum (134; 4.2X), and leg III (135; 2.2X).

- 11' Prosternal process present ..... 15
- 12(11) Head oblique in front viewed laterally; fastigium concave medially, slightly longer than eye length; antenna with at least 16 segments, flat in segments III–VIII, segment III longest; transverse furrow of pronotum situated a little to the rear of midlength; tibia III with 35 spines in the outer row; body length 74 mm ..... *Acrida confusa* Dirsh [Fig. 131]
- 12' Head not oblique viewed laterally; antenna without flattened segments; tibia III with less than 35 spines ..... 13
- 13(12') Midtegmen with a dense row of parallel thickened veinlets; anterior of transverse pronotal furrow with 3 slightly oblique grooves not reaching mid-longitudinal carina; femur III with black and brown spots; tibia III with 10 spines in the outer row; body length 23 mm ..... *Heteropternis* sp. [Fig. 132]
- 13' Midtegmen without dense row of thickened parallel veinlets ..... 14
- 14(13') Hind femur distinctly broad with an anterior and posterior black band in the swollen area; tibia III with 10 inner spines, black basally with submedian and apical brown bands; apical tarsal segment yellow except brown both ends; transverse furrow of brown pronotum located anterior of midlength, elevated medially with two slightly concave frontal furrows interrupted before the median carina; fore wing extended beyond the knee by one-fourth femoral length; body length 26 mm ..... *Aiolopus simulatrix simulatrix* (Walker) [Figs. 133–135]
- 14' Hind femur slightly broad with light brown dorsal band (sometimes reduced to 4 dorsal bands including apex); tibia III light brown to grayish brown with subbasal whitish yellow band, inner row with 11 spines; apical tarsal segment brown with yellow mottles; transverse pronotal furrow almost at midlength, convex medially with two transverse furrows in front extended to the black laterals; fore wing at rest brown dorsally and black laterally, extended beyond the knee by one-sixth femoral length; body length 18 mm ..... *Aiolopus thalassinus thalassinus* (Fabricius) [Figs. 136, 137]
- 15(11') Prosternal process smoothly rounded and shiny apically, penis-like; base of fastigium with an inverted V-furrow in the converging point of eyes; lower external lobe of femur III apically rounded, without spine; tibia III with 10 spines each in the outer and inner rows; fore wing brown with blackish to dark brown mottles, extended beyond the knee by about one-third femoral length; body length 32 mm ..... *Catantops spissus adustus* (Walker) [Fig. 138–140]
- 15' Prosternal process pointed apically; base of fastigium with a distinct groove, femur III yellowish brown with black knee and a spine in the lower external lobe; tibia III with 8 spines in the outer row and 9 in the inner row; fore wing greenish but reddish in basal half, extending slightly beyond the knee; body length 21 mm ..... *Oxya hyla* Stål [Figs. 141, 142]
- 16(9') Head vertical, numerous black patches present dorsally, frontally and laterally; front and cheek each with a pair of square-like black bands containing a circular median yellow spot; clypeus black in dorsal half with six yellow spots and yellow ventral half; labrum with a w-black band and 2 yellow spots in the middle; antenna 20-segmented, black except yellow segments XII and XVI, and yellowish brown apical two segments; pronotum yellowish green, anteriorly expanded collar-like partially covering back of head; fore wing yellowish green with black base, rounded apex as long as tip of abdomen and knee of femur





- III; broad median, narrow basal and apical black bands in femur III; tibia III with 6 outer and 8 inner row spines excluding those at apex; body length 35 mm ..... *Zonocerus variegatus* (Linnaeus) [Figs. 143–145]
- 16' Head oblique ..... 17
- 17(16') Eyes elongate; sides of head and lower lateral side of pronotum lined with wart-like tubercles, serrated-like; antennae arise in front of ocelli; Fore wing greenish, pointed at apex and extending beyond the tip of abdomen and knee; body length 34 mm ..... *Atractomorpha acutipennis gerstaeckeri* I. Bolivar [Figs. 146–148]
- 17' Eyes spherical and bulging; head and pronotum rough; tibia III with 8 spines in the outer row ..... 18
- 18(17') Fore wing red, not reaching abdominal tip or knee of femur III; pronotum and head reddish lined with numerous warts; posterior pronotum behind second transverse furrow heavily punctated; legs reddish except yellow apices of tibia I, basal tarsal segments of legs I and II; body length 20.5 mm ..... *Pyrgomorpha vignaudii* Guérin-Meneville [Fig. 149]
- 18' Fore wing extending well beyond tip of abdomen in the female, but up to knee only in the male; pronotum and head yellowish brown with less but larger warts; posterior pronotum behind second transverse furrow deeply and heavily punctated almost similar to wing base; legs uniformly yellowish brown except blackish venter of tibia III; body length 21 mm ..... *Pyrgomorpha cognata* Krauss [Figs. 150–152]
- 19(8') Head and pronotum finely punctated, smooth and shiny, strongly convex and subcylindrical viewed dorsally; pronotum covers the thorax only, posterior margin prominently concave; femur III flat and broad; tibia III with thin leaf-like 'spines' in anterior one-third [Family **Tridactylidae**] ..... 20
- 19' Pronotum extended posteriorly covering abdomen [Family **Tetrigidae**] ..... 21
- 20(19) Prominently black except whitish yellow eye margins, yellow brown leg I, blackish brown leg II, black femur III and whitish yellow tibia III; leg III with 5 long leaf-like outer and 4 inner spines in tibia; body length 5 mm ..... *Tridactylus* sp. A [Fig. 153]
- 20' Dark brown with whitish yellow or white areas in the body, wings and legs; head with a diamond-like dark brown band in ocellar region, vertex with 7–8 short dark brown bands; pronotum anteriorly and posterolaterally yellow; femur I pale whitish brown, II whitish with dark brown bands dorsally, III dark brown with a submedian and a subanterior transverse white bands; tibia with 4 pairs of short leaf-like spines; body length 8 mm ..... *Tridactylus* sp. B [Fig. 154]
- 21(19') Entire body coarsely covered with serrated outgrowths; pronotum expanded laterally with serrated edges; femora I–III leaf-like with dorsal, lateral and ventral outgrowths; tibia with 6 spines in the outer row and 5 in the inner row, serrations in between spines; antenna 15-segmented; body length 10 mm ..... *Hancockia* sp. [Figs. 155–157]
- 21' Entire body without serrated outgrowths; body length 10 mm or more ..... 22



Figs. 146–148. *Atractomorpha acutipennis gerstaeckeri* I. Bolivar, lateral view (146; 1.6X), dorsal view of head and pronotum (147; 3.2X), and leg III (148; 2.8X).

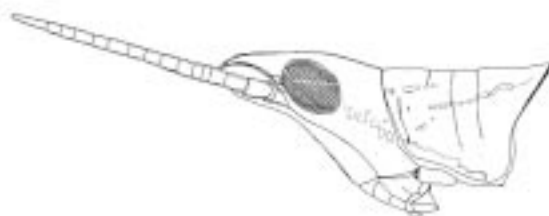
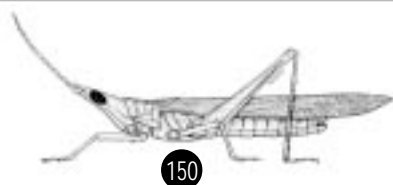


Fig. 149. *Pyrgomorpha vignaudii* Guerin-Meneville, lateral view of head and pronotum (5.5X).



Figs. 150–152. *Pyrgomorpha cognata* Krauss, lateral view (150; 2X), dorsal view of head and pronotum (151; 2.75X), leg III (152; 2.4X).

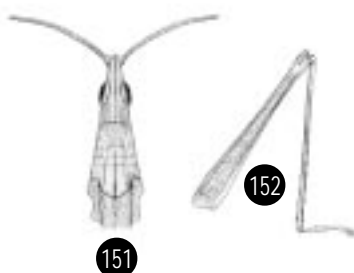
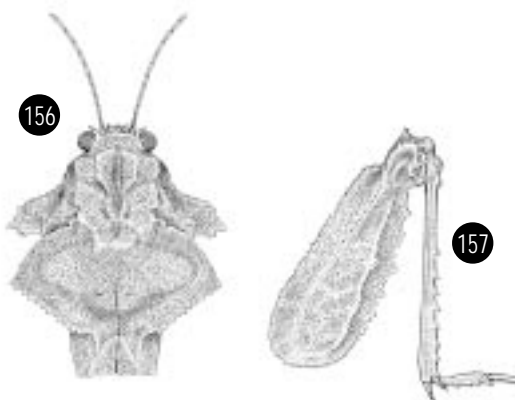
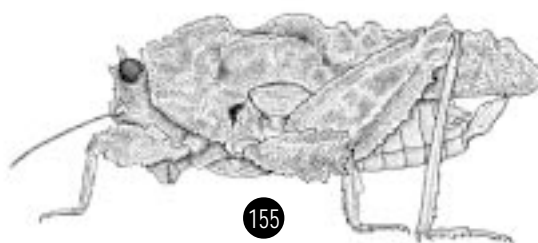


Fig. 153. *Tridactylus* sp. A, lateral view of tibia III (18X).



Fig. 154. *Tridactylus* sp. B, lateral view of tibia III (18X).



Figs. 155–157. *Hancockia* sp., lateral view (155; 5.3X), dorsal view of head and pronotum (156; 6X), and leg III (157; 6.6X).

- 22(21') Pronotum brown dorsally and black laterally, not surpassing the tip of cerci and the knee, transverse groove not distinct, lateral side (pleuron) roughened by short and rounded pebble-like warts and bears three transverse furrows, posterolateral angle moderately rounded; paired ocelli relatively larger; antenna 16-segmented, scape and pedicel with small grayish brown warts similar to those in frontal ridge and femora; femur III with 10 spines in the outer row; body length 10 mm ..... *Coptotettix* sp. [Figs. 158–160]
- 22' Pronotum not as above; antennal segments less than 16 segments; body length more than 13 mm ..... 23
- 23(22') Dull light brown with a black tinge between the shoulder; median pronotal ridge elevated on a small hump along the transverse furrow; propleuron with pale gray brown shades below the transverse furrows; posterolateral lobe long, rounded at apex, prominently projected to coxa II; mesopleuron and metapleuron black to gray similar to femora I and II; femur III with 5 oblique ridges; knee reaches tip of abdomen; tibia III with 7 spines in the outer row; body length 13 mm ..... *Paratettix scaber* (Thunberg) [Figs. 161–163]
- 23' Black species with a broad transverse white band between the shoulder; median pronotal ridge elevated on a large hump along the transverse furrow; propleuron black with white small tubercles, mottles and spots as in the head, thorax, legs and posterior segments of abdomen; posterolateral lobe short and slightly projected to coxa II; femur III with 5–7 oblique rows of ridges with peg-like spines; knee prominently beyond tip of abdomen; tibia III with 8 spines in outer row; body length 14.5 mm ..... *Paratettix dorsifer* (Walker) [Figs. 164–166]

## Order Mantodea

[Family Hymenopodidae] (*represented by a single genus*)

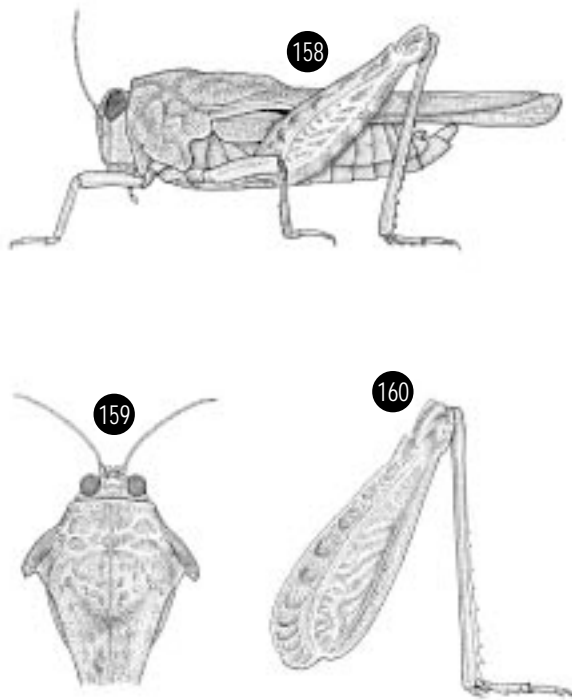
### *Pseudocreobotra* sp. [Fig. 167]

Foreleg raptorial with very large movable coxa, femur and tibia spinous; apices of femora II and III enlarged; tarsus 5-segmented; head with a process on vertex; pronotum laterally expanded; Fore wing green with a large circular or eye-ring pattern; abdomen laterally exposed, uncovered by wings at rest.

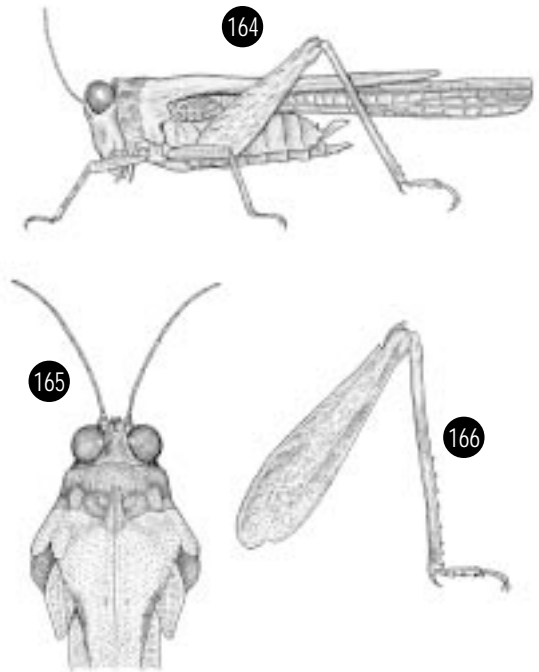
## Order Coleoptera

*Beetles*

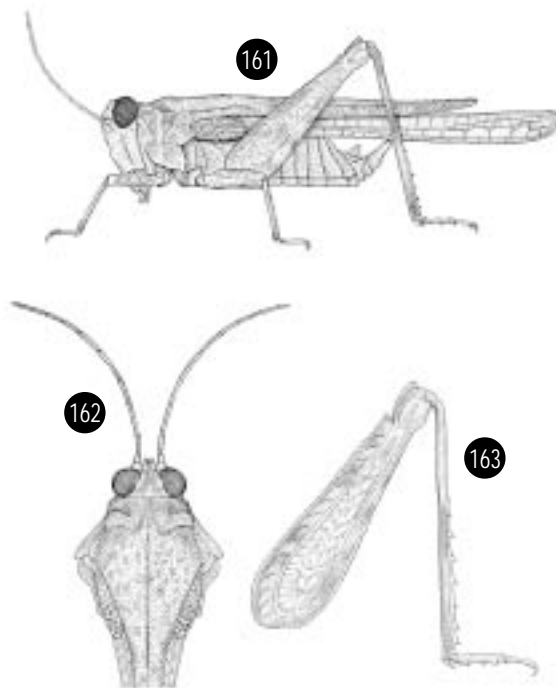
- 1 Coxa III fused to the metasternum dividing the basal visible abdominal sternite into two lateral portions; hypomeron narrow, notopleural sutures and lateral margins of prothorax present; metasternum with a transverse suture anterior of coxa III; antenna 11-segmented, filiform and inserted between the eyes and mandible; fore tibia with a tibial comb or cleaning organ [Family Carabidae] ..... 2
- 1' Coxa III movable, separated from metasternum and not dividing the basal visible abdominal sternite into 2 lateral portions; notopleural suture absent; hypomeron broad; antenna dorsal, not inserted between the eyes and mandibles ..... 20
- 2(1) Elytra black except yellow margins, truncate anteriorly with at least 8 longitudinal ridges and a yellow median zigzag transverse spot; two abdominal segments exposed posteriorly; pronotum brown, as long as wide with a long bristle on each midlateral side; head brown except silvery white eyes, smooth similar to pronotum; labrum more or less truncate with 6 hairs arranged in a



Figs. 158–160. *Coptotettix* sp., lateral view (158; 5.6X), dorsal view of head and pronotum (159; 9X), and leg III (160; 6.9X).



Figs. 164–166. *Paratettix dorsifer* (Walker), lateral view (164; 4.3X), dorsal view of head and pronotum (165; 6X), and leg III (166; 5.7X).



Figs. 161–163. *Paratettix scaber* (Thunberg), lateral view (161; 4X), dorsal view of head and pronotum (162; 7X), and leg III (163; 7X).

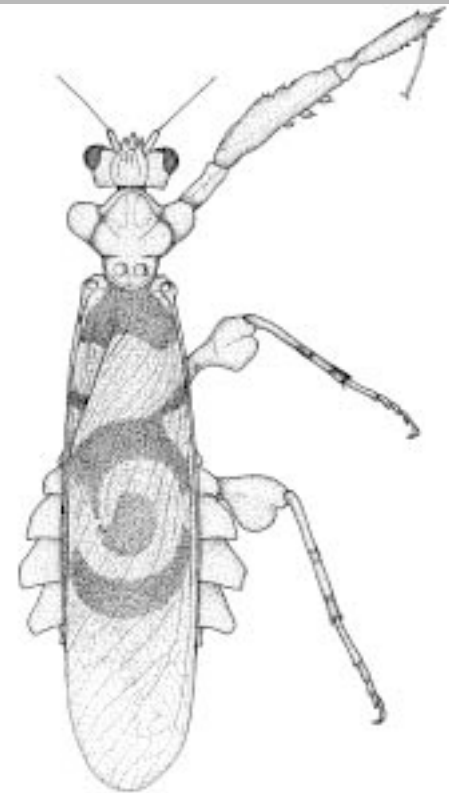


Fig. 167. *Pseudocreobotra* sp., dorsal view (2.3X).

- transverse row; antenna brown similar to the legs, posteroventral tip of femora I–III with a black spot; body length 20 mm ..... *Pheropsophus cincticollis* Ferte-Senectere [Fig. 168]
- 2' Elytral coloration and pattern variable ..... 3
- 3(2') Labrum toothed or anteriorly serrate; mandible covered by labrum or exposed, usually with two long inner teeth; legs, abdominal venter, propleuron and lateral margins of pronotum with white hairs ..... 4
- 3' Labrum often truncate, not serrated anteriorly; mandibles without long inner teeth; body without white hairs ..... 9
- 4(3) Labrum with 7 teeth and 4 long setae arranged in a transverse line, yellow along median; head and prothorax metallic blue and shiny; elytra coarsely punctured, dull bluish black; body length 12 mm ..... *Prothyma* cf. *versicolor* Dejean [Fig. 169]
- 4' Labrum with 1–5 teeth and 4–10 long setae; elytra with yellow markings .... 5
- 5(4') Labrum with 5 teeth and 5–6 setae ..... 6
- 5' Labrum with 1–3 teeth and 4–10 long setae ..... 7
- 6(5) Labrum sharply pointed midanteriorly with 6 setae almost covering entire mandibles; antennal segments I–IV not metallic; elytra bluish green with two black spots in the middle and in the posterior one-third, margins covered by a distinctly broad yellow longitudinal band with 3 inner branches resembling the letter E; body length 12.5 mm ..... *Cicindela* (*Lophyra*) *luxeri* Dejean [Figs. 170, 171]
- 6' Labrum convex and serrated anteriorly with 5 setae; dull black with metallic blue luster in the antennal segments I–IV, beneath the eye and lateral margins of elytra; black elytra with a distinctly long yellow marginal band not reaching apical spines, two small yellow spots present in the midbasal one-fifth and at midlength; body length 18–20 mm ..... *Cicindela* sp. [Figs. 172, 173]
- 7(5') Labrum with 5–7 setae and 3 teeth; mandibles yellow except blackish brown teeth; elytra dull black with brownish yellow tinge, margins yellow forming loops outside and inside of the humeral area, inside loop inverted J-like, succeeding marginal yellow band form two oblique letter Es on top of each other, suture with a lanceolate yellow band ..... *Cicindela* (*Lophyra*) nr. *catena* Fabricius [Fig. 174]
- 7' Labrum with 4 or 10 long setae and 1–3 teeth along anterior margin ..... 8
- 8(7') Labrum with 4 setae and 3 teeth along anterior margins; mandibles black exposing 2 long inner teeth; elytra black with fine and even punctures, each elytron bears 2 yellow spots above and below midlength, margins yellow with 5 inward branches, second and fourth the longest reaching midelytron; body length 9–10 mm ..... *Cicindela* (*Lophyra*) sp. [Figs. 175, 176]
- 8' Labrum with 10 white long setae and an anterior median tooth; elytra with 2 rounded yellow spots in anterior one-third and below midlength, lateral margins with a C-band along the shoulder, r-band in the middle and an r- or c-band towards tip; body length 8.5 mm ..... *Cicindela* (*Ifasina*) sp. [Fig. 177]

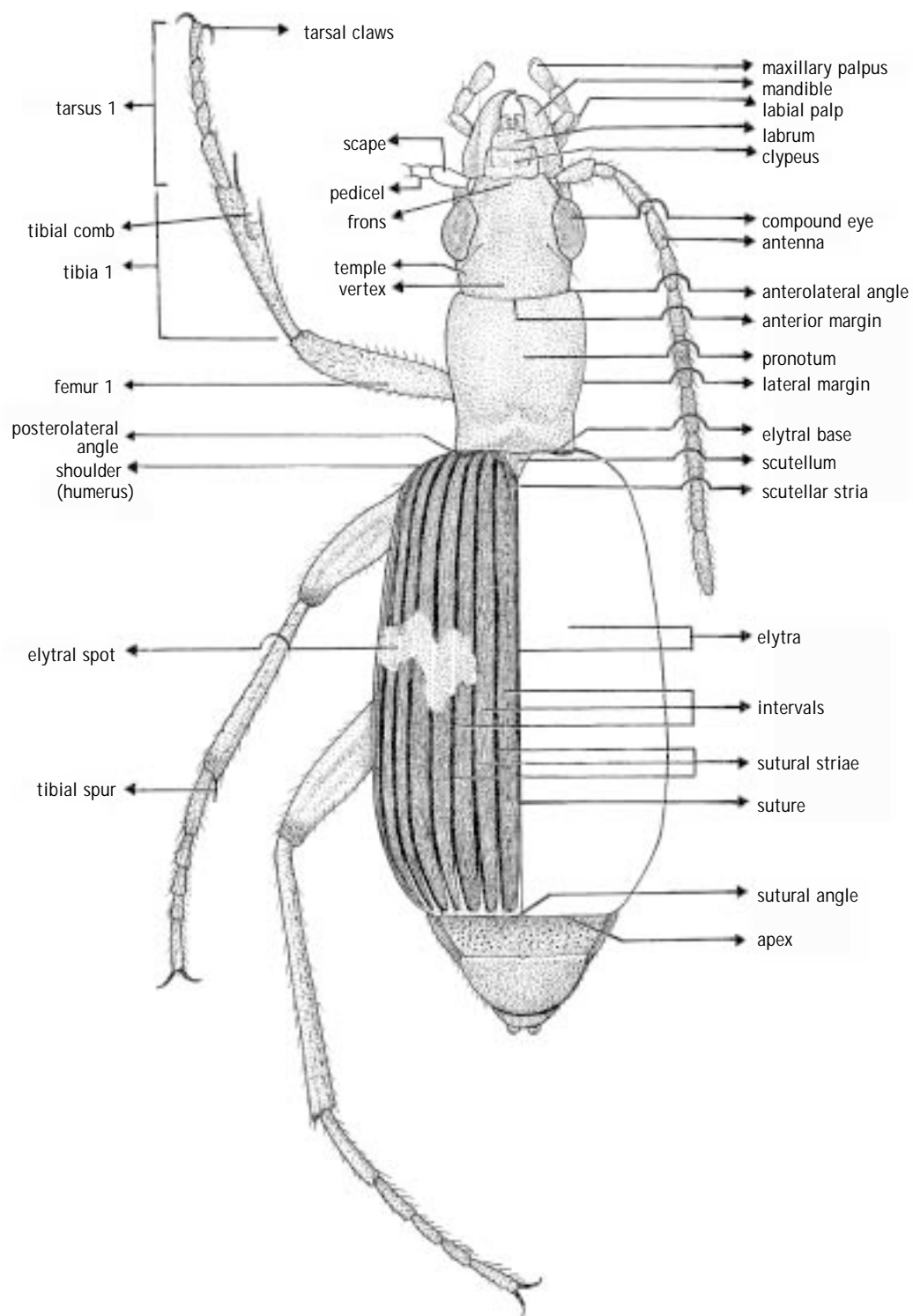


Fig. 168. *Pheropsophus cincticollis* Ferte-Senectere, dorsal view (7.1X).

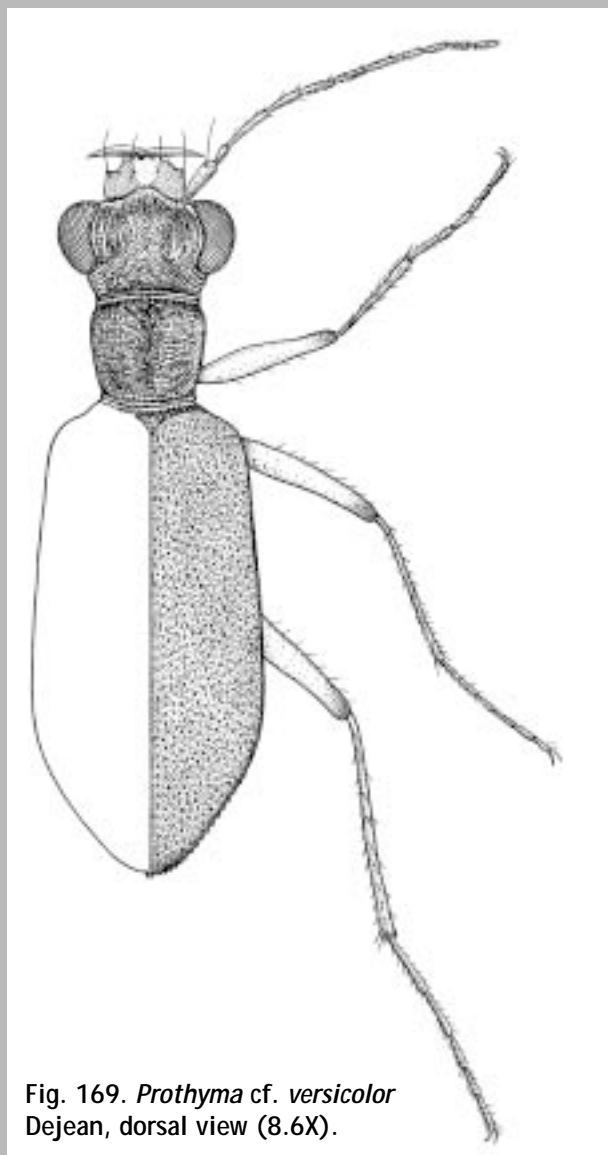


Fig. 169. *Prothyma* cf. *versicolor* Dejean, dorsal view (8.6X).

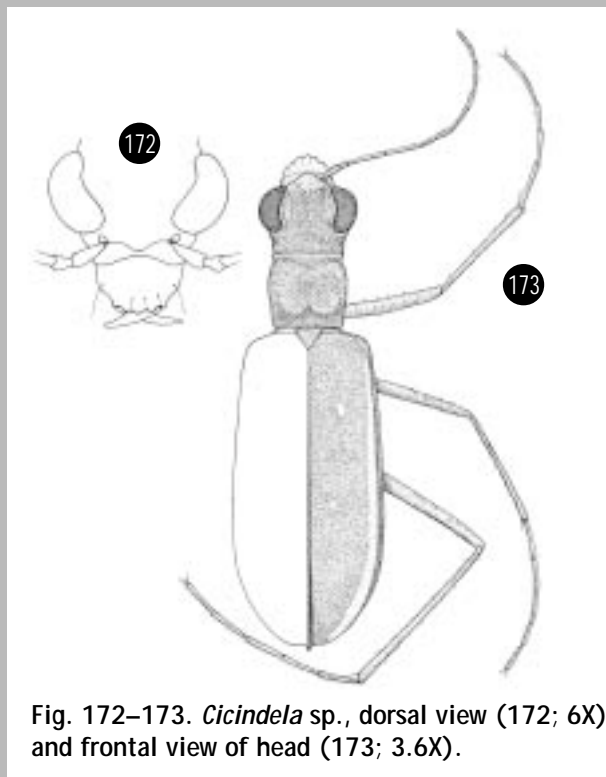
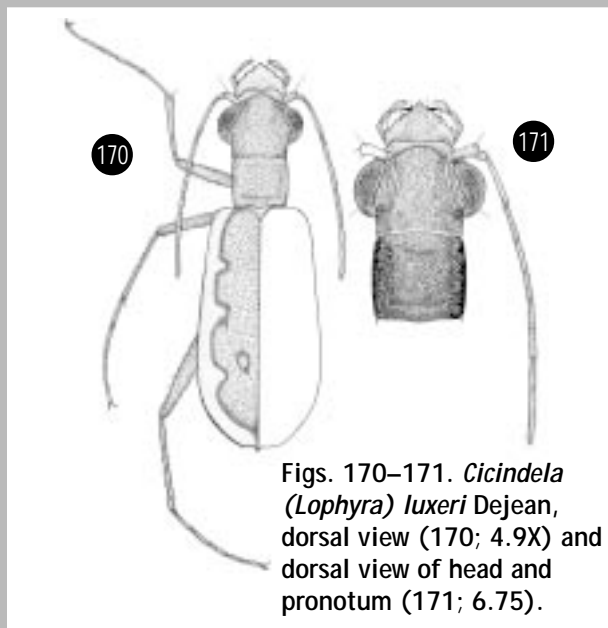


Fig. 172–173. *Cicindela* sp., dorsal view (172; 6X) and frontal view of head (173; 3.6X).



Figs. 170–171. *Cicindela* (*Lophyra*) *luxeri* Dejean, dorsal view (170; 4.9X) and dorsal view of head and pronotum (171; 6.75).

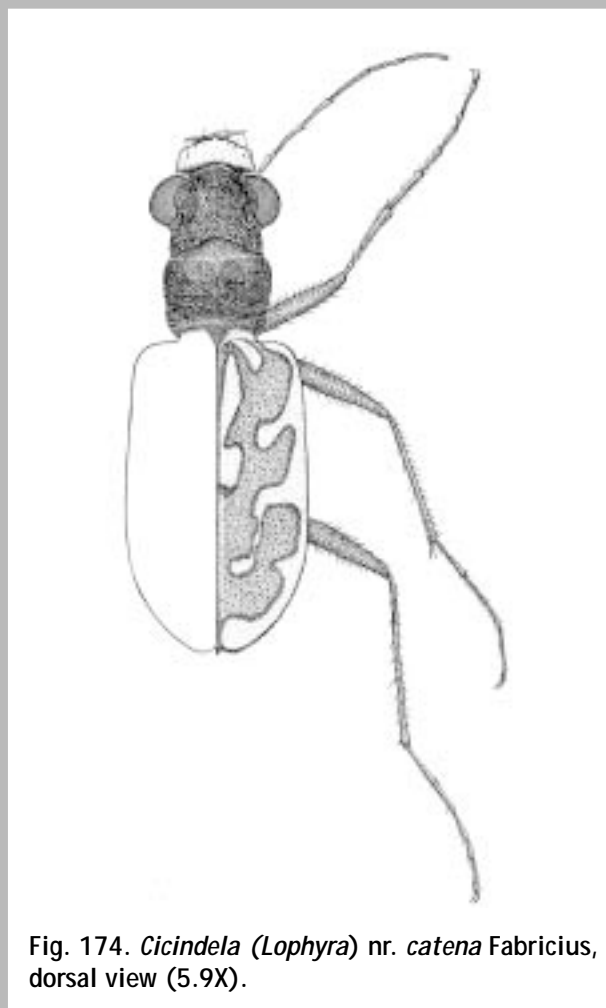
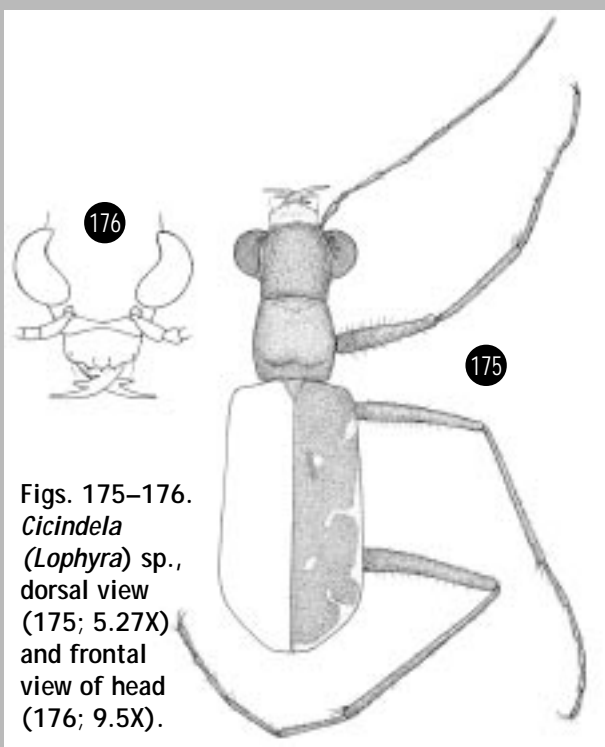


Fig. 174. *Cicindela* (*Lophyra*) nr. *catena* Fabricius, dorsal view (5.9X).





Figs. 175–176.  
*Cicindela*  
(*Lophyra*) sp.,  
dorsal view  
(175; 5.27X)  
and frontal  
view of head  
(176; 9.5X).

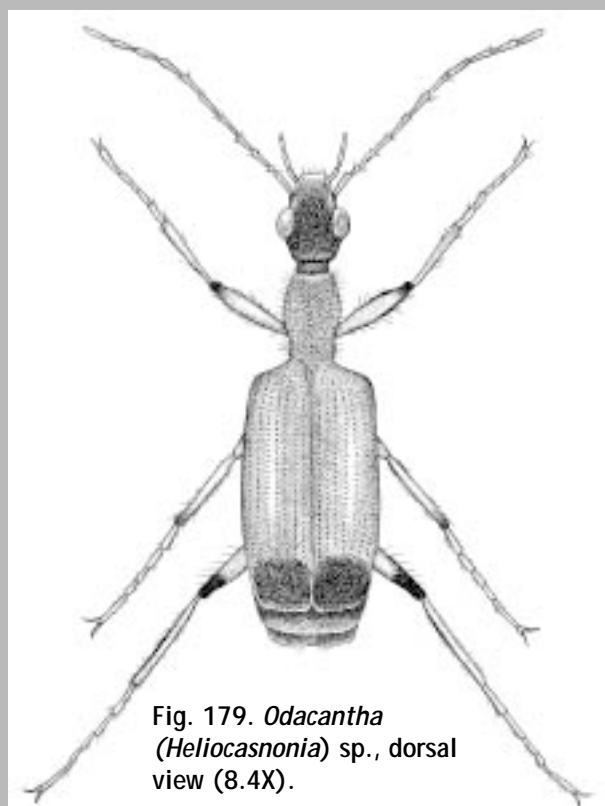


Fig. 179. *Odacantha*  
(*Heliocasnonia*) sp., dorsal  
view (8.4X).

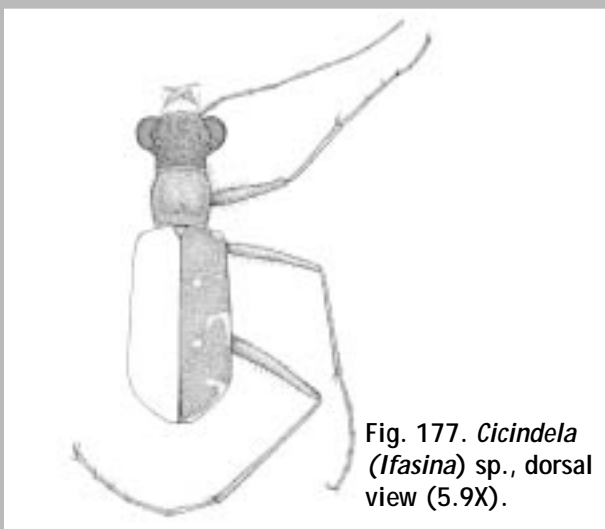


Fig. 177. *Cicindela*  
(*Ifasina*) sp., dorsal  
view (5.9X).

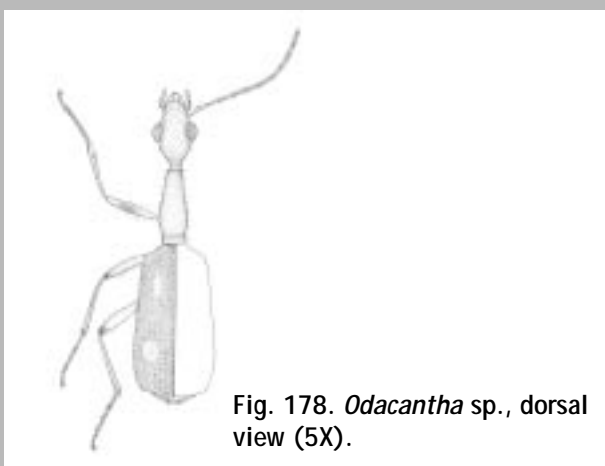
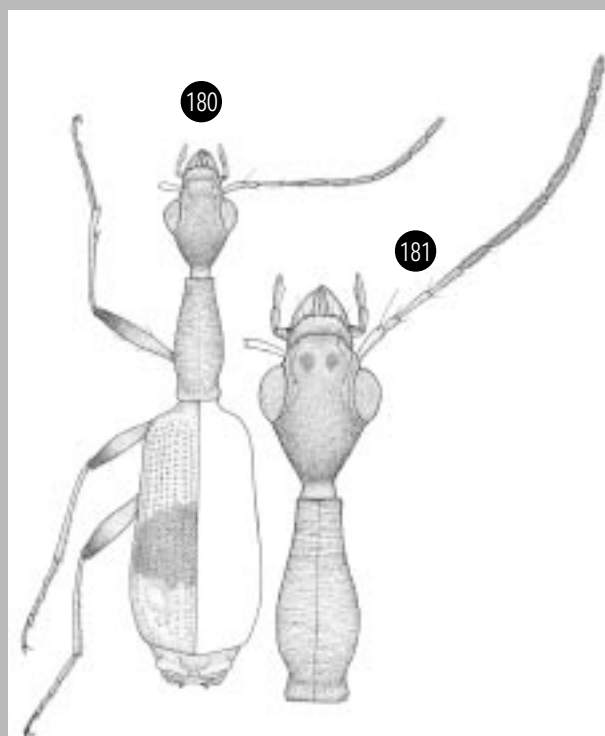


Fig. 178. *Odacantha* sp., dorsal  
view (5X).



Figs. 180–181. *Archicolliuris* cf. *dimidiata*  
Chaudoir, dorsal view (18; 8.8X) and dorsal view  
of head and pronotum (181; 17X).

9(3')	Pronotum prominently longer than wide, usually cylindrical .....	10
9'	Pronotum not cylindrical, often as wide as long to wider than long .....	15
10(9)	Pronotum with a lateral groove .....	11
10'	Pronotum without lateral groove .....	12
11(10)	Pronotum reddish brown, barrel-shaped with transverse striae, lateral groove with 10 setae each; head black with two pairs of supraorbital setae; labrum truncate; elytra black to reddish brown with erect hairs, a pair of brown spots anteriorly and a pair of white spots posteriorly; legs hairy particularly the femora; general coloration black; body length 7.2 mm .....	<i>Odacantha</i> sp. [Fig. 178]
11'	Pronotum black with dense fine punctations, widest at midlength, lateral grooves distinctly parallel to each other and lined with more than 10 setae in each row; black head with 7 supraorbital setae; labrum slightly emarginate; brown elytra with a posterior black spot each; legs brown with black apices of all femora; body length 7.4 mm .....	<i>Odacantha (Heliocasonia)</i> sp. [Fig. 179]
12(10')	Pronotum orange red with transverse striae dorsally and ventrally without hairs; head black smooth and shiny with 2 supraorbital setae; elytra orange red with a broad transverse black band almost at midhalf and a pair of white spots posterior of band; body length 8 mm .....	<i>Archicolliuris</i> cf. <i>dimidiata</i> Chaudoir [Figs. 180, 181]
12'	Pronotum orange, without transverse striae; elytra usually metallic to dull blue .....	13
13(12')	Antennal segment I very long, as long as head width across eyes; labrum trilobed with 6 setae; shiny blue head and orange pronotum coarsely punctated and moderately hairy; elytra blue without spots and hairy; body length 9 mm .....	<i>Drypta</i> sp. [Figs. 182, 183]
13'	Antennal segment I short, less than half of head width across eyes; labrum truncate with less than 6 setae; elytra not hairy .....	14
14(13')	Pronotum and head densely punctated; black head coarsely punctured dorsally, laterally and ventrally, posterior lateral margin behind the eye relatively straight and oblique; antennal segments dark brown except yellow brown scape; elytra slightly lustrous blue; apical one-half of femora dark brown; body length 7.3 mm .....	<i>Eucolliuris</i> sp. A [Figs. 184, 185]
14'	Pronotum and head sparsely punctured; shiny black head with fine punctations dorsally and ventrally, unpunctated laterally; lateral side of head behind the eyes smooth and rounded; antenna dark reddish brown with yellow segments I, II basal two-thirds of III and basal one-half of IV; elytra metallic lustrous blue; apices of femora black; body length 7.5 mm .....	<i>Eucolliuris</i> sp. B [Figs. 186, 187]
15(9')	Pronotum orange red with lateral constriction subposteriorly; head coarsely punctured and slightly flat; neck reddish brown .....	16
15'	Pronotum black to metallic blue .....	17

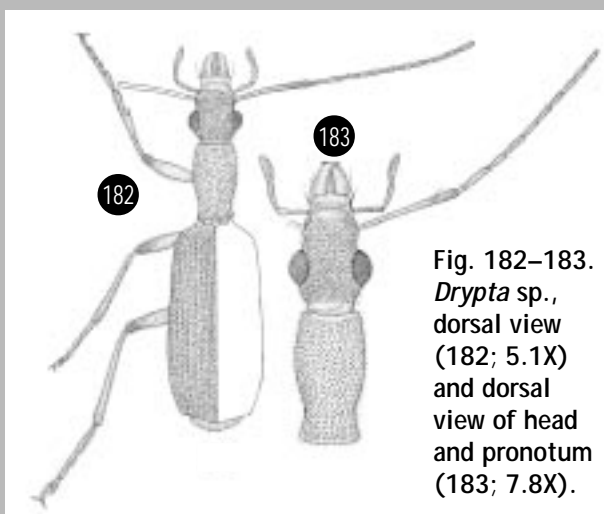
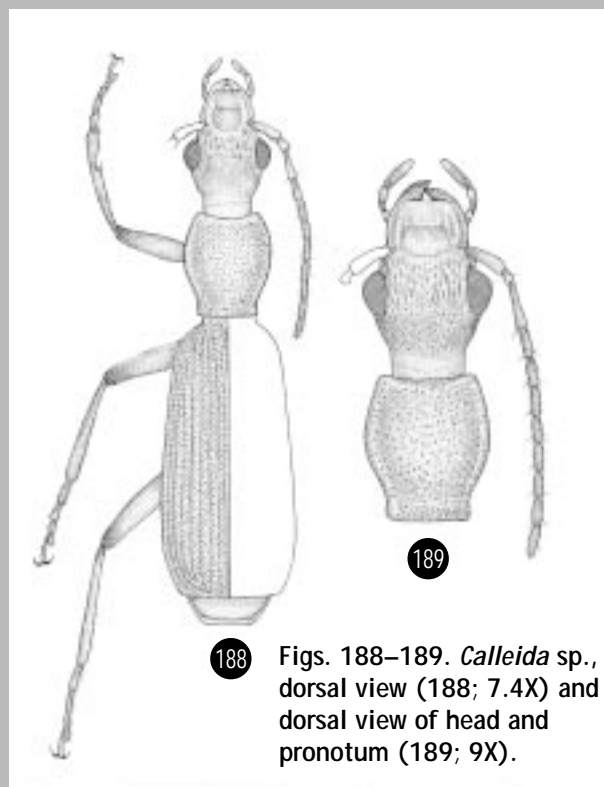
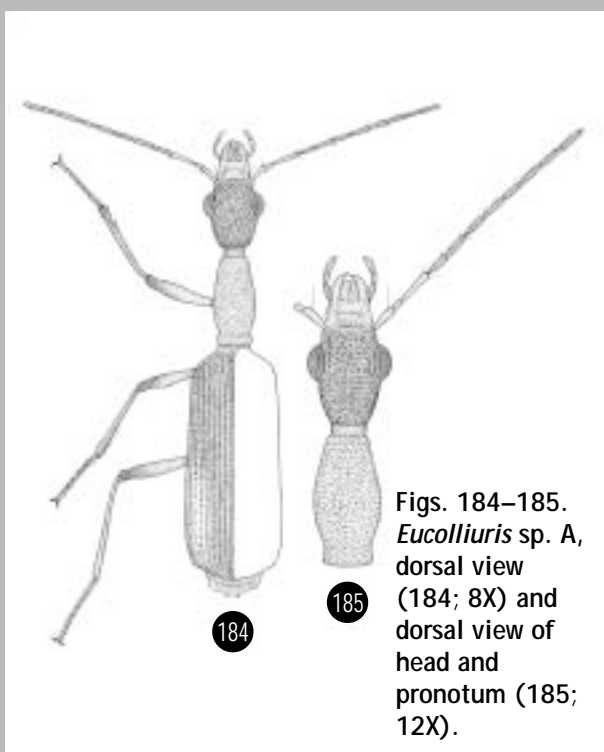


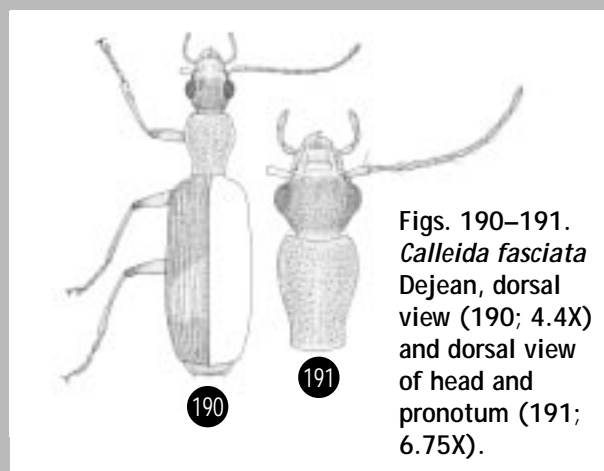
Fig. 182–183. *Drypta* sp., dorsal view (182; 5.1X) and dorsal view of head and pronotum (183; 7.8X).



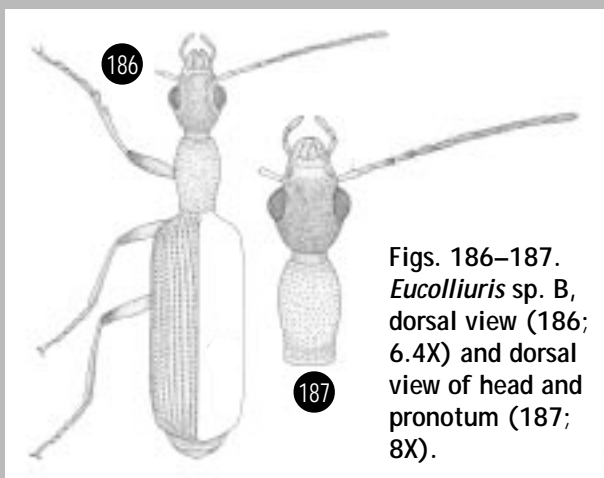
Figs. 188–189. *Calleida* sp., dorsal view (188; 7.4X) and dorsal view of head and pronotum (189; 9X).



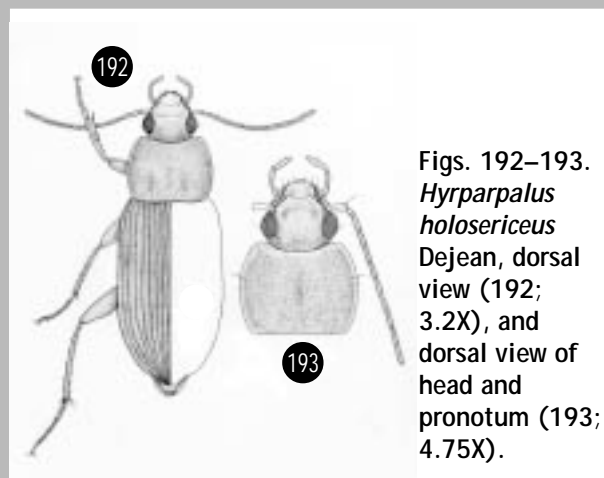
Figs. 184–185. *Eucolliuris* sp. A, dorsal view (184; 8X) and dorsal view of head and pronotum (185; 12X).



Figs. 190–191. *Calleida fasciata* Dejean, dorsal view (190; 4.4X) and dorsal view of head and pronotum (191; 6.75X).

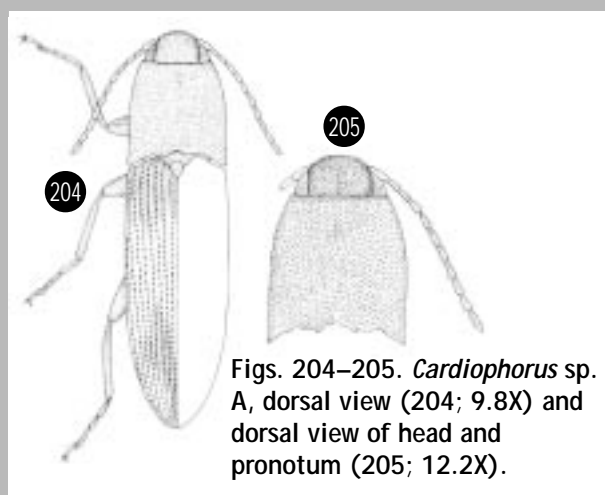
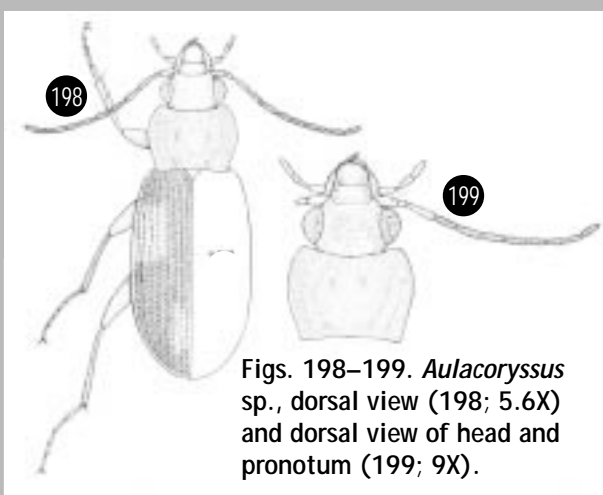
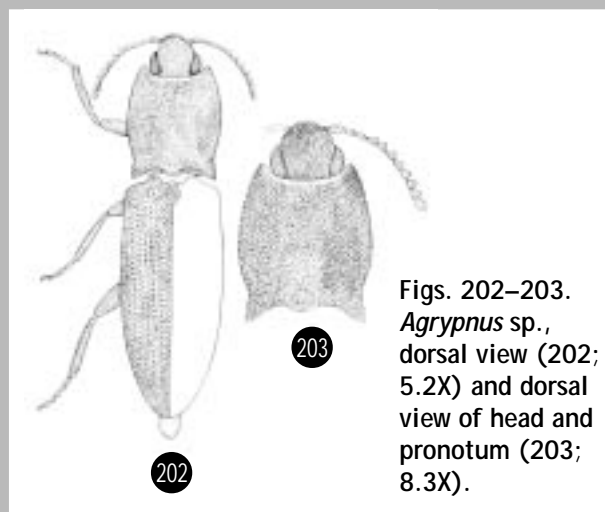
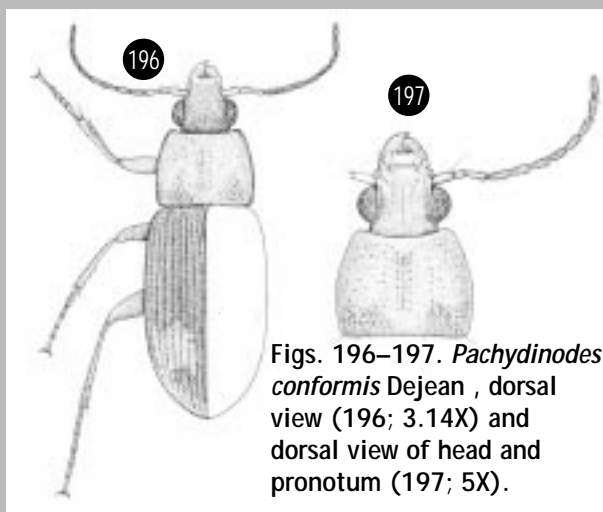
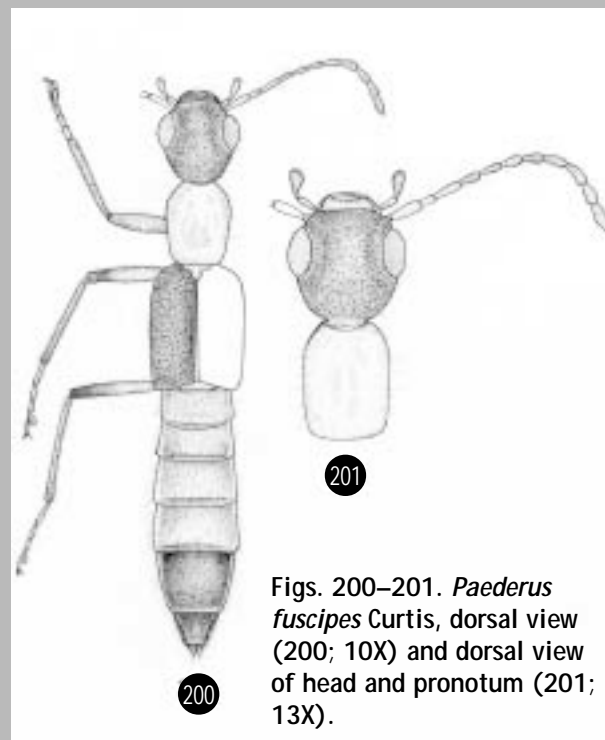
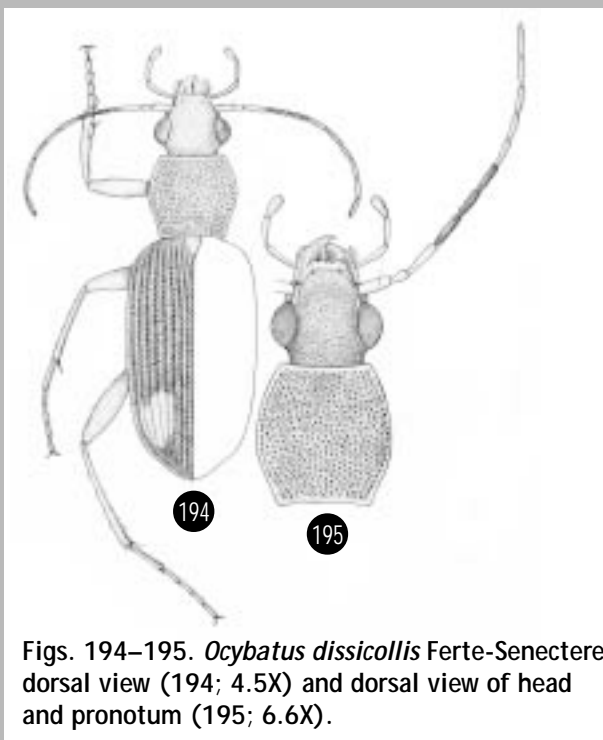


Figs. 186–187. *Eucolliuris* sp. B, dorsal view (186; 6.4X) and dorsal view of head and pronotum (187; 8X).

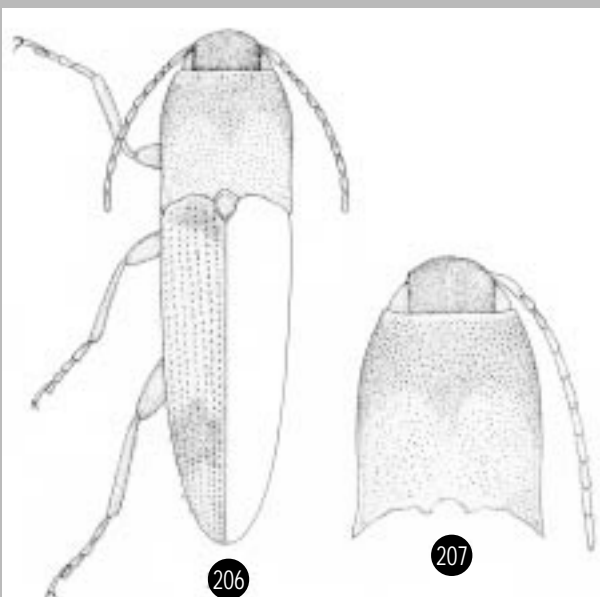


Figs. 192–193. *Hyrparpalus holosericeus* Dejean, dorsal view (192; 3.2X), and dorsal view of head and pronotum (193; 4.75X).

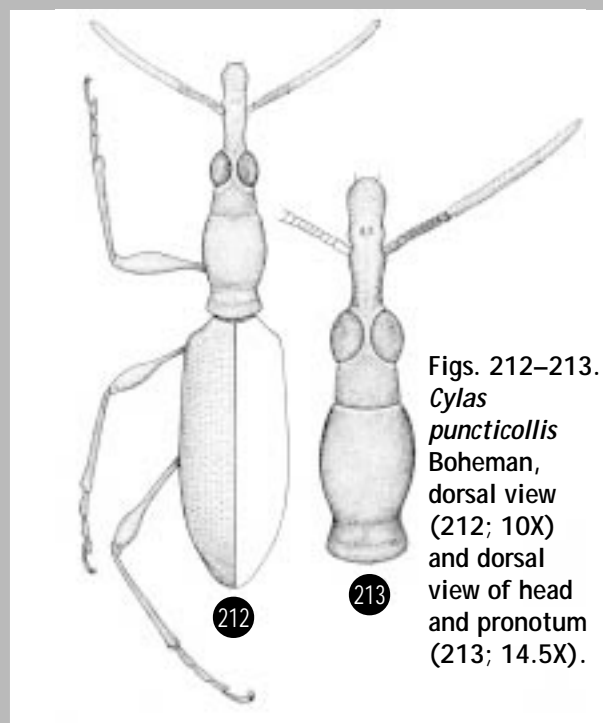
- 16(15) Elytra uniformly metallic blue green; antennae reddish brown except black tips and dark reddish brown segments III and IV; labrum notched midanteriorly ....  
..... *Calleida* sp. [Figs. 188, 189]
- 16' Elytra blue green with a broad transverse yellow brown band in the middle; antenna uniformly brown; labrum truncate anteriorly .....  
..... *Calleida fasciata* Dejean [Figs. 190, 191]
- 17(15') Elytra dull black without spots or marks, margins brown, posterior tip obliquely truncate exposing last abdominal segment; pronotum black with brown margins, anteriorly concave, posteriorly truncate and evenly convex laterally; labrum with 6 setae; body length 11.5 mm .....  
..... *Hyrparpalus holosericeus* Dejean [Figs. 192, 193]
- 17' Elytra with markings ..... 18
- 18(17') Elytra with a pair of subglobular yellow spots in posterior one-third; head and pronotum metallic blue; pronotum more densely punctated than head; antenna brown except black reddish brown segments IV–VI; margins of labrum with 6 setae; body length 11 mm .....  
..... *Ocybatus discicollis* Ferte-Senectere [Figs. 194, 195]
- 18' Elytra with different markings; pronotum smooth ..... 19
- 19(18') Both head and pronotum smooth and metallic blue; elytra black with fine white hairs and an inverted J- or C-shaped yellow band posteriorly; body length 13.5 mm ..... *Pachydinodes conformis* Dejean [Figs. 196, 197]
- 19' Head black except brown labrum, anterior clypeus and mandibles; pronotum brown marginally with black to dark brown areas medially; elytra yellow brown in outer one-half, dark brown in the other half towards the suture; body length 8 mm ..... *Aulacoryssus* sp. [Figs. 198, 199]
- 20(1') Abdomen with 6 or 7 visible sternites and 5 exposed tergites; labial palp 3-segmented; prothorax smooth, orange red with a longitudinal row of hairs on each side, shortly elongate and subcylindrical; head moderately flat and uniformly black except labrum yellow and antenna yellowish brown dorsally and ventrally with long brown hairs; short and bluish elytra punctated, covered with fine silvery hair; abdomen orange red similar to pronotum except black terminal segment; leg I yellow brown, II blackish brown except yellow basal three-fourths of femur and III almost black with basal half of femur yellow; tarsi with 2 equal claws [Family **Staphylinidae**] .....  
..... *Paederus fuscipes* Curtis [Figs. 200, 201]
- 20' Not as above ..... 21
- 21(20') Elongate bodied beetles with 'clicking' mechanism made by the long prosternal process and by an anteriorly open mesosternal cavity; posterolateral area of pronotum elongated, pointed and spine-like; antennae usually serrate; tarsi simple or bilobed segments 3 and 4 [Family **Elateridae**] ..... 22
- 21' Beetles without "clicking mechanism", long poststernal process absent ..... 24
- 22(21) Entire body including scape, femur and tibia uniformly covered by clubbed setae; head with a laterally expanded frons partly covering the eyes; pronotum strongly convex along anterior three-fourths and flat posteriorly; dark brown to grayish brown; body 9 mm long ..... *Agrypnus* sp. [Figs. 202, 203]



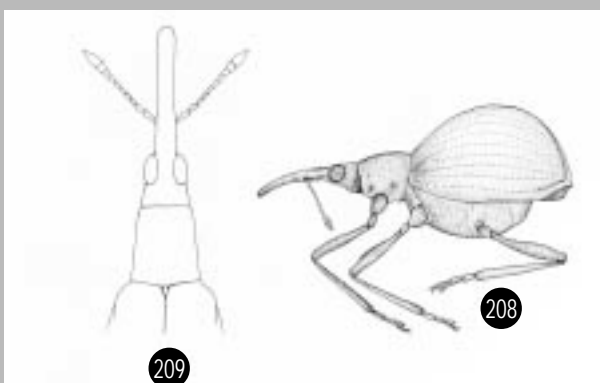
- 22' Body covered with fine white hairs; smaller species 3.8-5.0 mm long ..... 23
- 23(22') Head and pronotum brown except basal half of pronotum yellow; elytra as wide as pronotum anteriorly, narrows posteriorly, dull yellow with pale brown anterior and a broad transverse black band below midlength; venter yellow except lateral edge of abdomen brown, legs yellow; body 3.8 mm long .....  
..... *Cardiophorus* sp. A [Figs. 204, 205]
- 23' Head black; pronotum brown with a small black longitudinal band anteriorly; elytra brownish yellow with an inverted w-black band anteriorly and a V-black band posteriorly; venter brown with black spots on the lateral edges of abdomen; body 5 mm long ..... *Cardiophorus* sp. B [Figs. 206, 207]
- 24(21') Head produced into a snout or rostrum; antenna elbowed with a short 1 or 3-segmented club and a long scape; prothorax without defined lateral margins; tarsi with 4th segment hidden in deeply bilobed 3rd segment ..... 25
- 24' Without the combination of above characters ..... 32
- 25(24) Pronotum narrower than the strongly dome-shaped elytra; long rostrum uniformly curved downwards; trochanter moderately elongated, if not, antennal club very long [Family **Apionidae**] ..... 26
- 25' Not as above ..... 29
- 26(25) Black snout beetle, body less than 5 mm long; pronotum with a ring-like constriction at anterior one-third; antennal club short, multisegmented; elytra strongly convex with prominent striae; trochanter moderately elongate; abdomen ovate or subglobular ..... 27
- 26' Black to dark brownish red, more than 6 mm long; club of antenna single, very long; pronotum constricted in posterior one-third; elytra mostly smooth without deep longitudinal striae; trochanter short and oblique ..... 28
- 27(26) Rostrum gently curved downwards with two shallow longitudinal grooves in front of eye and antenna arising behind midlength; head finely punctate with three low parallel ridges between eyes forming two shallow grooves; temple shallowly punctate; pronotum punctured similar to the head, nearly parallel-sided with two depressions laterally and anterolateral angle not bulged; metapleuron, abdominal venter and femora I–III all finely punctured; black, 2.6 mm long ..... *Apion* sp. [Figs. 208, 209]
- 27' Rostrum strongly curved downwards with two deep longitudinal punctated grooves in front of eyes; head coarsely punctured including temple and, ridges close to the eyes prominent with a deep groove in between; pronotum deeply punctured, widest posteriorly and constricted along anterior one-third, terminating at a deep lateral pit, anterolateral angle strongly rounded forming a conical anterior pronotal margin; metapleuron, abdominal venter, femora and tibiae coarsely punctured; uniformly black, 4.8 mm long .....  
..... *Canopion* sp. [Figs. 210, 211]
- 28(26') Vertex, temple and pronotum uniformly black and smooth; elytra, venter of metathorax and abdomen very finely punctured; legs black .....  
..... *Cylas puncticollis puncticollis* Boheman [Figs. 212, 213]
- 28' Vertex, temple and midpronotum dark reddish brown, slightly punctured; elytra, abdominal and metathoracic venter and lateral sides of pronotum coarsely punctured; legs reddish brown ..... *Cylas* sp. [Figs. 214, 215]



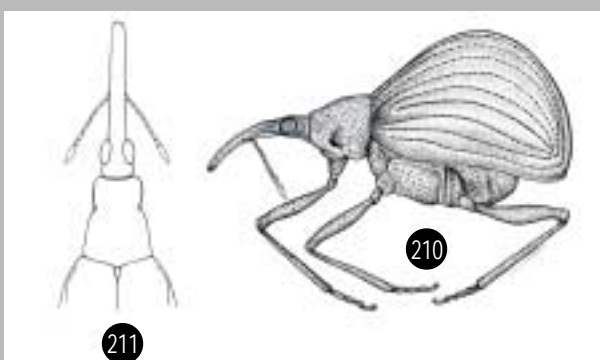
Figs. 206–207. *Cardiophorus* sp. B, dorsal view (206; 16.8X) and dorsal view of head and pronotum (207; 24.6X).



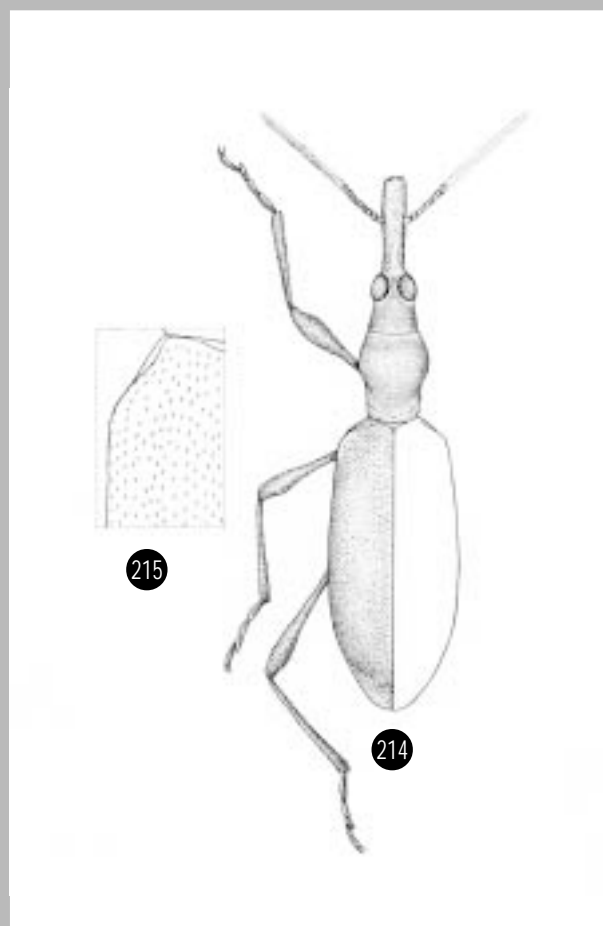
Figs. 212–213. *Cylas puncticollis* Boheman, dorsal view (212; 10X) and dorsal view of head and pronotum (213; 14.5X).



Figs. 208–209. *Apion* sp., lateral view (208; 9.5X) and dorsal view of head, pronotum and part of elytra (209; 14.8X).



Figs. 210–211. *Canopion* sp., lateral view (210; 20.5X) and dorsal view of head, prothorax, and part of elytra (211; 27X).



Figs. 214–215. *Cylas* sp., dorsal view (214; 10.3X) and close-up of elytral punctures (215; 25X).



- 29(25') Antenna straight, scape short, club 3-segmented; eyes before or at midlength of head; rostrum apically expanded; vertex and temple smooth, well-rounded and extended behind the eyes; smooth pronotum narrowed anteriorly and broad posteriorly with a strongly concave midanterior margin and two transverse grooves anterior and posterior of the convex middorsum; elytra subrectangular with squarish punctures; uniformly brownish except dark brown antennae; body 6 mm long [Family **Attelabidae**] ..... *Parapoderus fuscicornis* Fabricius [Fig. 216]
- 29' Antennae elbowed, scape very long; club 1–3 segmented; eyes close to posterior portion of head; rostrum usually not expanded at apex; vertex and temple coarse or moderately smooth; pronotal shape variable; elytra without subrectangular punctures; color variable; body small to moderately large [Family **Curculionidae**] ..... 30
- 30(29') Antenna with very long scape, arises close to anterior head margin; head widest at eye area, midapical margin deeply notched, posterior end with 5–7 fine transverse ridges; pronotum and scape with club setae; distal half of femur enlarged; abdomen ovoid to subglobular; uniformly black; body length 6 mm ..... *Mitophorus acerbus* Faust [Figs. 217, 218]
- 30' Antenna with short scape, arises close to eyes or at midlength of head; abdomen usually elongate ..... 31
- 31(30') Pronotum as wide and almost as long as elytra with exposed abdominal tip, densely covered with rounded network of punctures; antenna 8-segmented with F1 shorter than F2 and F3 and short ovoid club smooth and 1-segmented; elytra coarsely punctured, intervals much narrower than striae punctures, often with 4 reddish spots; scutellar apex rounded; dark reddish brown; body less than 5 mm long ..... *Sitophilus zeamais* Motschulsky [Figs. 219, 220]
- 31' Pronotum narrow, about one-third length of elytra that covers entire abdomen, without rounded network of punctures; antennae 11-segmented, elongated F1 a little longer than combined length of F2 and F3, all funicular segments blackish red, wider than long except F1, club 3-segmented with a tapered tip; elytra deep evenly spaced punctures covered with short, white fine hairs, scutellar apex with or without a tubercle; uniformly black; body length 14 mm ..... *Gasteroclisus* spp. [Figs. 221–224]
- 32(24') Head large, abruptly narrowed posteriorly forming a narrow neck, eye oblique in side view; prominently indented opposite base of antenna; pronotum narrower than the head or elytra; elytra soft and entire; fore coxal cavities merged and open behind; coxae I and II elongate; tarsi 5-5-4 segmented; claws cleft or dentate; abdomen with 5 or 6 free sternites [Family **Meloidae**] ..... 33
- 32' Head usually small; elytra always hard ..... 39
- 33(32) Antennae long with slender segments, apical segments not club-like; body slender and elongate, grayish to black covered with very short and fine pubescence; ovoid eyes strongly oblique viewed laterally; head black; elytra without any spot and clothed with white short and fine hairs ..... 34
- 33' Antennae moderately short with segments about as long as wide ..... 37

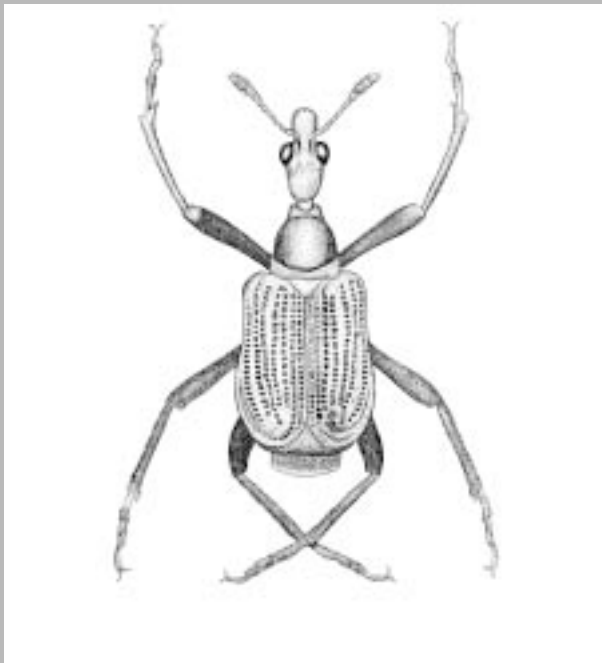
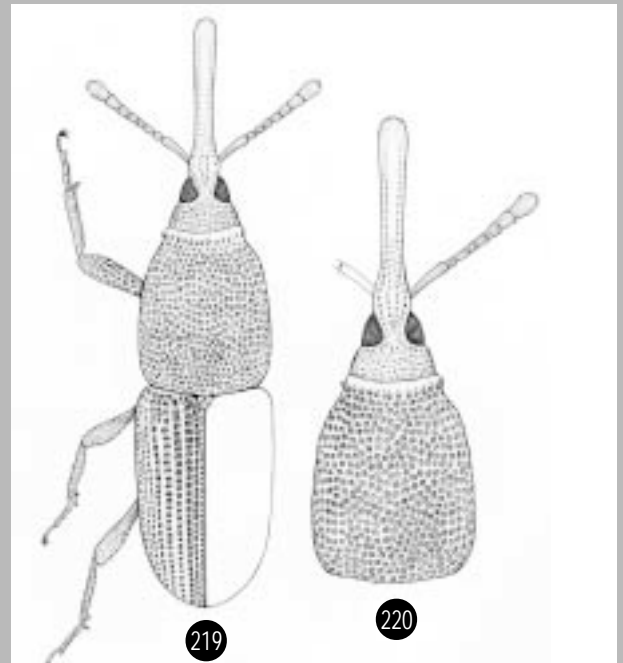
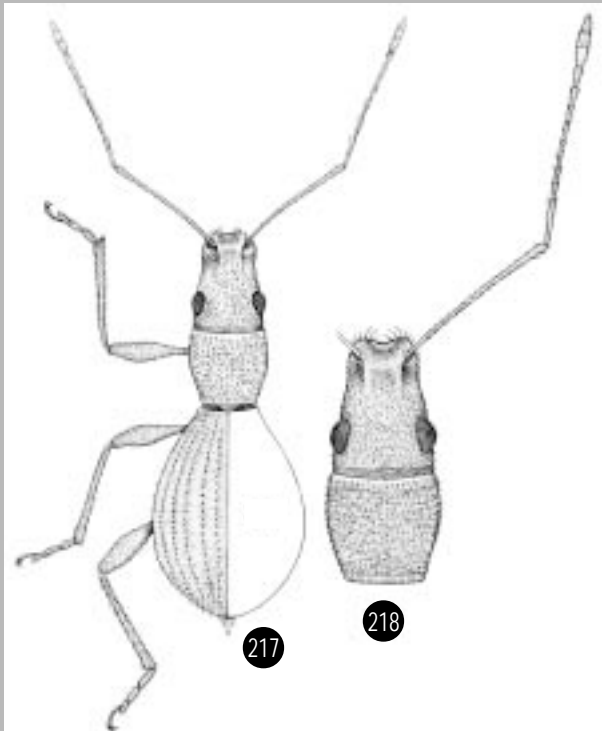


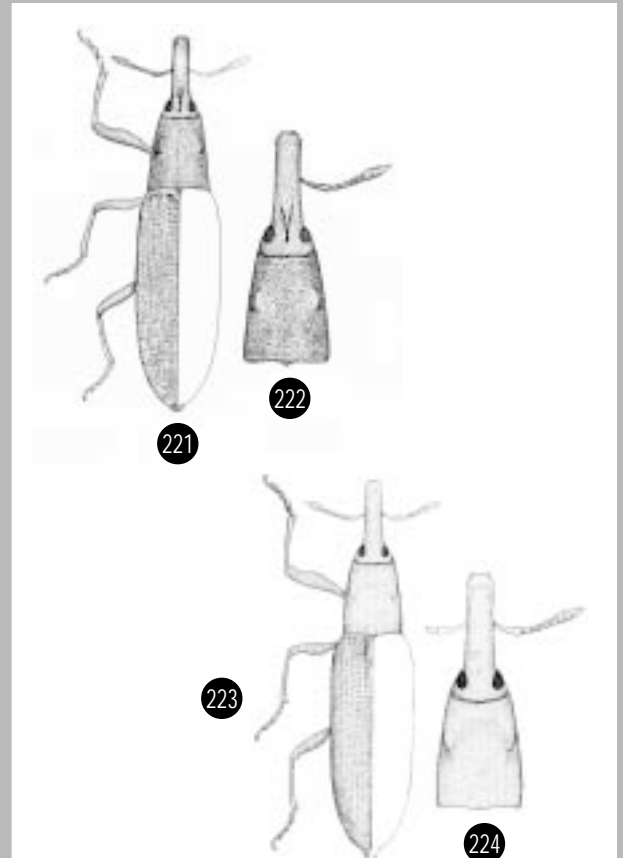
Fig. 216. *Parapoderus fuscicornis* Fabricius, dorsal view (7.2X).



Figs. 219–220. *Sitophilus zeamais* Motschulsky, dorsal view (219; 17.4X) and dorsal view of head and pronotum (220; 25X).



Figs. 217–218. *Mitophorus acerbus* Faust, dorsal view (217; 8.8X) and dorsal view of head and pronotum (218; 13X).



Figs. 221–224. *Gasteroclisus* spp., dorsal views (221, 5X; 223, 5X) and dorsal views of head and pronotum (222, 5.4X; 224, 5.4X).

- 34(33) Temple orange-yellow, lower portion with fine white hairs; head coarsely punctated; labrum with a yellow median notch; antennae black with reddish brown tinge, segment III (F1) as long as combined length of IV and V, V–XI flat and almost wider than long; entire body clothed with fine white hairs ..... *Epicauta* sp. [Fig. 225]
- 34' Not as above ..... 35
- 35(34') Uniformly black head, thorax and abdomen; legs black except reddish brown claws; tibia I–III with a pair of apicoventral spines; tip of the outer spine broad and somewhat hollow inside; antennae black except brownish yellow scape and pedicel, scape as long as or slightly shorter than the longest segment III; combined length of pedicel and funicular segment I as long as distance between eyes in frontal view; body length 18 mm ..... *Cylindrothorax* sp. [Fig. 226]
- 35' Not as above, prothorax usually orange red ..... 36
- 36(35') Body long and slender, approximately 20 mm long; clypeus and labrum not clearly differentiated into two rectangular plates separated by a deep transverse groove; femora I–III each with an outer longitudinal median groove; antennal segments long and slender, segment XI narrowed from midlength to tip producing a sharply pointed process; venter of thorax clothed with long white hairs; temple very high, its height more than one eye diameter viewed laterally ..... *Cylindrothorax melanocephala* Fabricius [Figs. 227, 228]
- 36' Smaller, 11–14 mm long; clypeus and labrum prominent, labrum distinctly and transversely rectangular producing a deep transverse groove in between; all femora without longitudinal median groove; antenna long and slender with segment XI uniformly slender; venter of thorax with short fine white hairs; temple narrow, shorter than eye diameter viewed laterally ..... *Cylindrothorax spurcaticollis* Fabricius [Figs. 229–231]
- 37(33') Elytra with an anterior pair of large ovoid orange yellow spots, almost converged basally and two broad orange yellow transverse bands in the median and below the median; laterally with a longitudinal orange yellow band below the shoulder; antennae orange-yellow except black scape and pedicel, funicular segments I, II, and III brownish yellow; head black, punctured and clothed with short hairs, vertex hairs projecting forward and frons hairs directed to each other; black, hairy and punctured pronotum with a subapical and posterior transverse groove and a median shallow pit; body length 18 mm ..... *Mylabris* cf. *amplectens* Gerstaecker [Figs. 232, 233]
- 37' Without the combination of the above characters ..... 38
- 38(37') Elytra with two transverse yellow zigzag bands posterior of the elongate yellow anterior band, laterally with an elongate yellow L-band below humeri connected to the base of the anterior band; elytron with moderately long whitish yellow and black erect hairs; head coarsely punctured, frons with long yellow hairs, clypeus and labrum with long yellow hairs and a few much longer black hairs along margins, vertex with more black hairs than yellow hairs; pronotum prominently punctured similar to head clothed with long yellow hairs, with a shallow posterior groove and gently sloped anterior one-half; antennae black except orange yellow segments VI–IX ..... *Mylabris* sp. A [Figs. 234, 235]

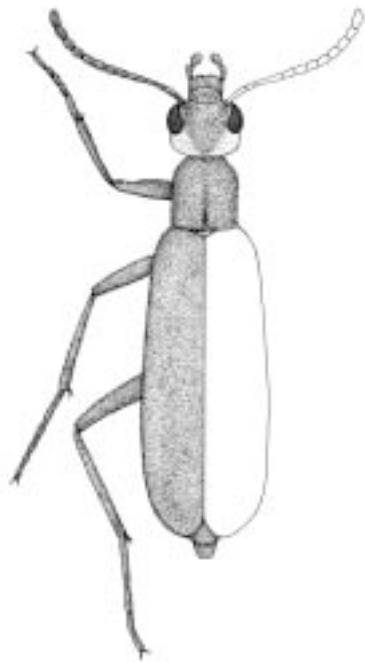
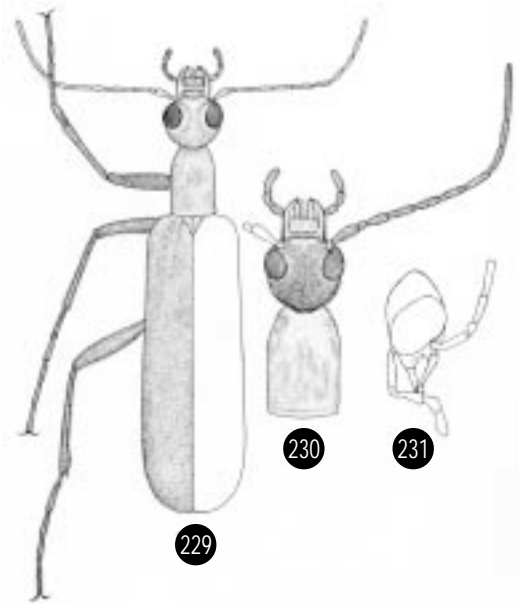


Fig. 225. *Epicauta* sp., dorsal view (7X).



Figs. 229–231. *Cyllindrothorax spurcaticollis* Fabricius, dorsal view (229; 4.2X), dorsal view of head and pronotum (230; 5.4X) and lateral view of head (231; 6X).

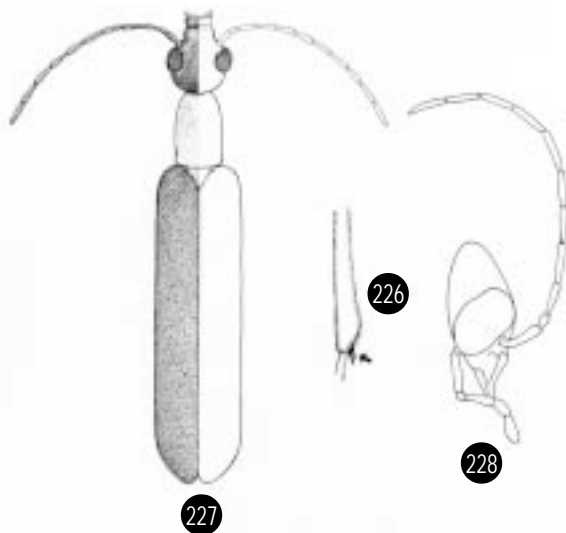
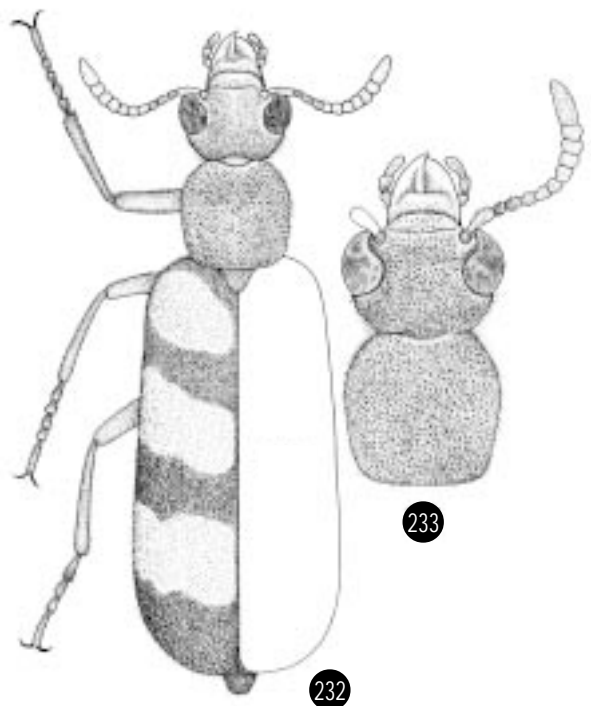


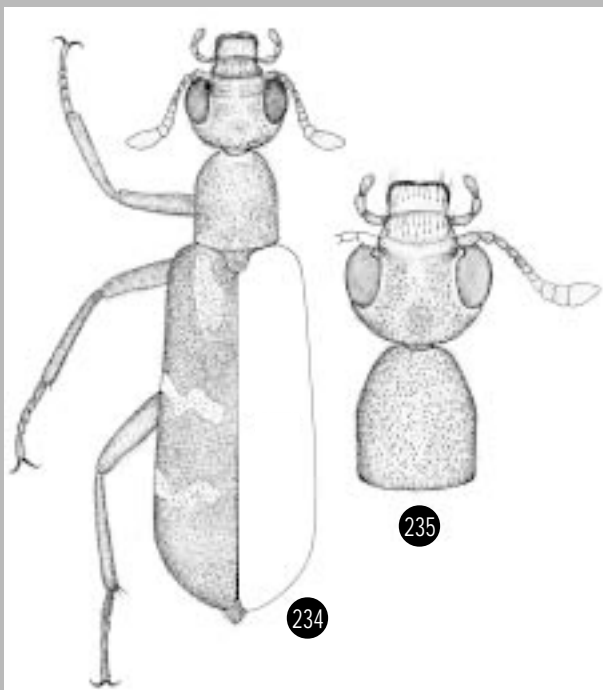
Fig. 226. *Cyllindrothorax* sp., lateral view of tibia III with a pair of apicoventral spines (8.5X).

Figs. 227–228. *Cyllindrothorax melanocephala* Fabricius, dorsal view (227; 7.3X) and lateral view of head (228; 7X).



Figs. 232–233. *Mylabris* cf. *amplectens* Gerstaecker, dorsal view (232; 4.3X) and dorsal view of head and pronotum (233; 5.3X).

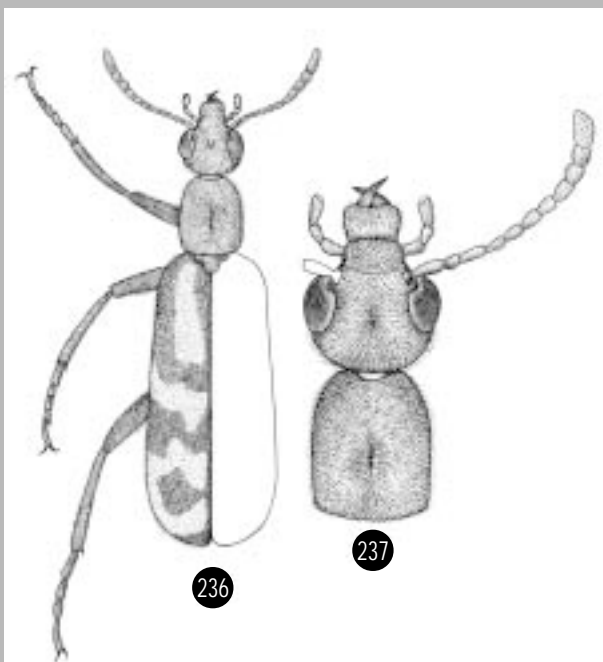
- 38' Elytra with a broad yellow transverse median band, C-shaped posterior band and an oblongate yellow band anteriorly, all bands connected to each other along lateral margins up to the shoulder and the anteriorly elongated band; elytron clothed with long yellow hairs anteriorly and shorter ones posteriorly; head finely punctured with long silvery white hairs in frons, clypeus and labrum; white hairs on frons converging, vertex with short silvery hairs and long black hairs near the frons; pronotum prominently covered with long silvery white hairs, posteriorly with a median transverse groove; antennae black in segments I–II, brownish in III–IV and orange red in V–XI ..... *Mylabris* sp. B [Figs. 236, 237]
- 39(32') Ant-like beetles; head strongly deflexed with small eyes; prothorax subcylindrical, narrowed along posterior one-third; antenna 11-segmented; maxillary palps with a large securiform to pointed apical segment; elytra entire; tarsal segmentation 5-5-4 without epipleura and striae; abdomen with 5 sternites free [Family **Anthicidae**] ..... 40
- 39' Not ant-like in appearance; antennal and tarsal segmentation different ..... 43
- 40(39) Pronotum widest along anterior one-third, finely punctated, moderately convex and narrow posteriorly terminating to a small transverse ring extended obliquely to coxa I; head finely punctated; elytra blackish brown to dark reddish brown with a pair of pale yellow brown spots near humeri, fine punctures without distinct striae; femora II and III less swollen than femur I ..... *Anthicus* sp. [Fig. 238]
- 40' Without the combination of the above characters ..... 41
- 41(40') Elytra smooth without a transverse white band of hairs, twice as long as pronotum; posterior lobe of pronotum at basal one-third, divided medially by a longitudinal shallow groove forming two small humps; anterior pronotal lobe smooth and subglobose with very fine white hairs, slightly longer than its height; head clothed with creeping light brown hairs; femur III with a black swollen apical half and a slender reddish brown basal half; general color black except dark brown antennae and dark brownish red elytra ..... *Formicomus* sp. A [Fig. 239]
- 41' Elytra with interrupted transverse band of white hairs near the humeri ..... 42
- 42(41') Head, prothorax and venter of mesothorax dark brown to brownish red; antenna black except brown scape, pedicel and fucicular segments I–III, midposterior pronotum with hairs, not shiny and plate-like; elytra with a thick transverse white band in anterior one-fourth and a lighter but wider transverse white band in posterior one-fourth; legs black to dark reddish brown with brown basal one-third of femur III ..... *Formicomus* sp. B [Fig. 240]
- 42' Uniformly black except brownish antennal segments I–V; midposterior pronotum smooth, shiny, plate-like and hairless; anterior one-fourth of elytra with a transverse band of sparsely set white hairs; all legs black ..... *Formicomus* sp. C [Fig. 241]
- 43(39') Frons prominently developed over the antennal insertions; eyes deeply emarginate, wider than long pronotum strongly concave anteriorly and extended laterally; tarsus without lobed segment claws simple; abdomen with 5 basal 3 sternite segments fused; elytra covering sides of abdomen [Family **Tenebrionidae**] ..... 44



Figs. 234–235. *Mylabris* sp. A, dorsal view (234; 5.8X) and dorsal view of head and pronotum (235; 9X).



Fig. 238. *Anthicus* sp., dorsal view (24X).



Figs. 236–237. *Mylabris* sp. B, dorsal view (236; 4.4X) and dorsal view head and pronotum (237; 7X).



Fig. 239. *Formicomus* sp. A, dorsal view (18X).

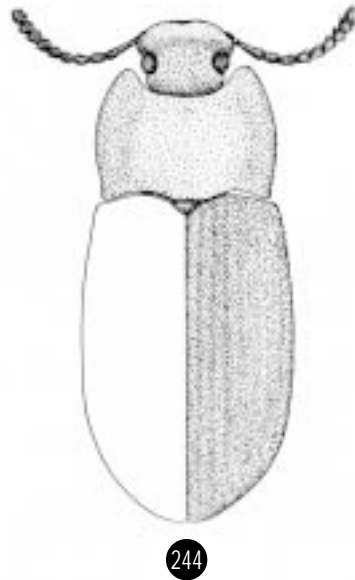
43'	Frons not strongly developed over antennal bases .....	46
44(43)	Lateral margins of pronotum nearly parallel; head, pronotum and elytra coarsely punctured, without hairs; broad midanterior notch present in the head; elytral striae distinct, without clubbed hairs; first funicular segment of antennae almost as long as second ..... <i>Tenebrio</i> sp. [Figs. 242, 243]	
44'	Lateral pronotal margins strongly convex, elytra and pronotum covered with appressed clubbed hairs .....	45
45(44')	Midanterior part of head with a moderate notch; eyes visible from above rounded; apical end of elytra rounded, elytral striae with 1–2 rows of clubbed hairs ..... <i>Gonocephalum</i> sp. A [Figs. 244, 245]	
45'	Midanterior part of head with a deep notch; eyes moderately elongate, oblique and converging anteriorly; elytral striae with 3–4 rows of clubbed hairs ..... <i>Gonocephalum</i> sp. B [Figs. 246, 247]	
46(43')	Head, pronotum, and elytra uniformly punctured and setose; eyes strongly emarginate; antenna with moderately long terminal segment; pronotum subcylindrical and broadest at midhalf, margins ill-defined; leg strongly hairy with slender tibia without spur; tarsal segmentation 5-5-4 with long basal segment, claws simple, penultimate segment widely lobed underneath apical segment; spongy ventrally; abdomen with 5 visible sternites [Family <i>Lagriidae</i> ] .....	47
46'	Without the full combination of above characters .....	48
47(46)	Elytra black; head, pronotum and elytra coarsely punctured, densely covered with erect white hairs; generally black with bluish luster in the pronotum; antennae black, segments globose except III and XI; clypeus with a wide anterior notch; femur and tibia with long white hairs ..... <i>Lagria villosa</i> Fabricius [Fig. 248]	
47'	Elytra lustrous brown; head, pronotum and elytra sparsely covered with erect white hairs, antenna blackish brown, terminal segment elongate and longer than combined length of segments VIII, IX, and X; clypeus with a wide V-shaped notch; femur and tibia with moderately long white hairs ..... <i>Chrysolagria cuprina</i> Thomson [Figs. 249, 250]	
48(46')	Body strongly convex or rounded; head deflexed, deeply sunk into the prothorax; lateral edge of pronotum strongly curved; antennae with a 3-segmented club; terminal segment of maxillary palp large and securiform; coxa I close together and transverse; tarsal segmentation 4-4-4, 3rd segment hidden; claws toothed beneath; abdomen with 5 or 6 visible sternites [Family <i>Coccinellidae</i> ] .....	49
48'	Body not strongly convex; head not deflexed; tarsal claws simple .....	58
49(48)	Small, less than 2 mm long; globose black with oblique brown spot running from shoulder to midwidth of elytra; entire body with fine white pubescence ... <i>Scymnus</i> sp. [Fig. 251]	
49'	Moderately large, more than 2 mm long; elytra with different markings; entire body without white hairs .....	50



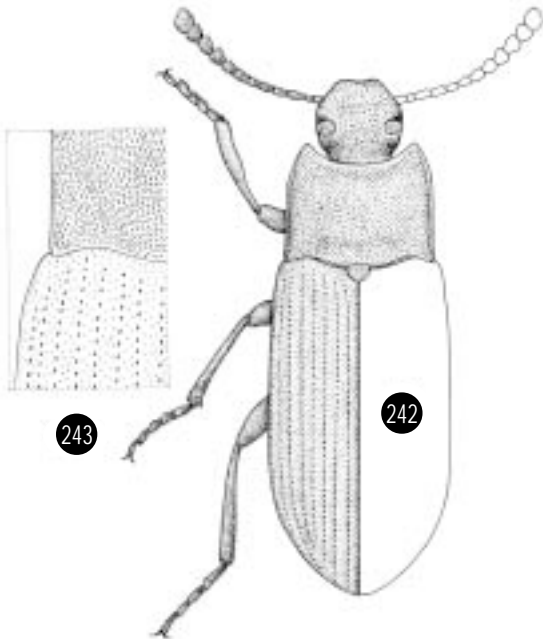
Fig. 240. *Formicomus* sp. B, dorsal view (12.6X).



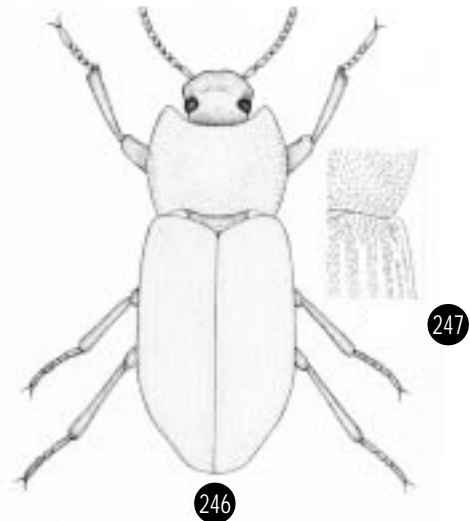
Fig. 241. *Formicomus* sp. C, dorsal view (13.7X).



Figs. 244–245. *Gonocephalum* sp. A, dorsal view (244; 8.8X) and close-up of right lateral part of pronotum and elytron (245; 17X).



Figs. 242–243. *Tenebrio* sp., dorsal view (242; 7X) and close-up of left lateral part of pronotum and elytron (243; 13X).



Figs. 246–247. *Gonocephalum* sp. B, dorsal view (246; 5X) and close-up of right lateral part of pronotum and elytron (247; 9X).



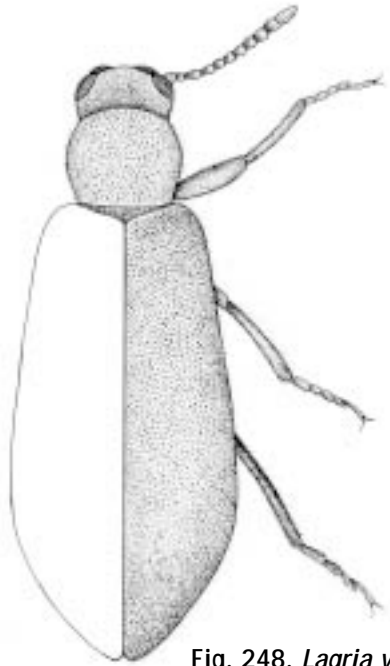


Fig. 248. *Lagria villosa* Fabricius, dorsal view (7.4X).

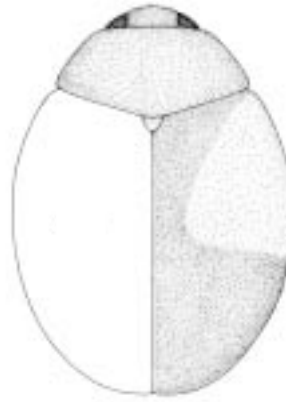
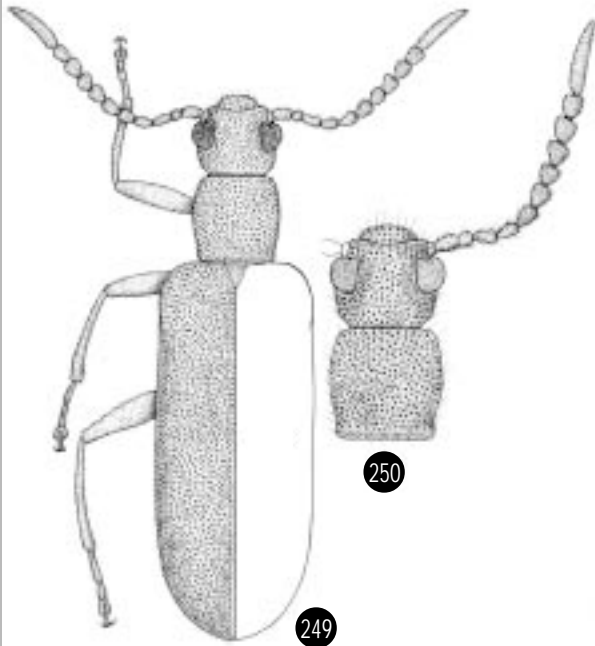
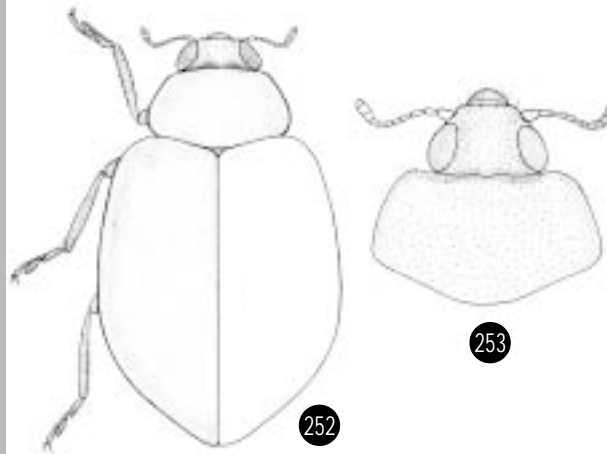


Fig. 251. *Scymnus* sp., dorsal view (32X).



Figs. 249–250. *Chrysolagria cuprina* Thomson, dorsal view (249; 8.9X) and dorsal view of head and pronotum (250; 11X).



Figs. 252–253. *Micraspis* sp., dorsal view (252; 9.8X) and dorsal view of head and pronotum (253; 16.7X).

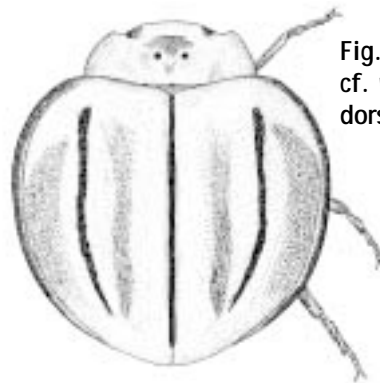


Fig. 254. *Micraspis* cf. *vincta* (Gorham), dorsal view (8.6X).

- 50(49') Elytra uniformly yellowish brown except black sutural line, rounded laterally in apical one-third and moderately pointed at apex; head gray posteriorly; terminal segment of antenna strongly rounded ..... *Micraspis* sp. [Figs. 252, 253]
- 50' Not as above, elytral color patterns different ..... 51
- 51(50') Elytra yellowish cream to orange brown with margins black and a median longitudinal basal band aborted; pronotum with or without paired spots; strongly convex beetle, body length 5 mm ..... *Micraspis* cf. *vincta* (Gorham) [Fig. 254]
- 51' Elytra with different patterns ..... 52
- 52(51') Elytra lustrous black with yellow margins; head and pronotum brown; body length 3 mm ..... *Chilocorus* sp. [Fig. 255]
- 52' Not as above ..... 53
- 53(52') Pronotum yellow with a quadrate black band on anterior margin; elytra yellowish brown with black sutural line, 2 ovoid black spots in the middle of basal one-half pointed towards each other and a pair of irregularly round black spots diverging apically ..... *Xanthadalia effusa* Erichson [Fig. 256]
- 53' Pronotum without a quadrate black band on anterior margin ..... 54
- 54(53') Elytra black with 2 transverse yellow bands or yellow with elongate spots ... 55
- 54' Not as above, elytra with many black or yellow spots ..... 56
- 55(54) Elytra black with transverse yellow brown bands slightly behind middle and an apical tip; pronotum brown and head entirely black; body length 5–5.7 mm .... *Xanthadalia* sp. A [Figs. 257]
- 55' Elytra yellow with 2 pairs of subanterior and subposterior elongate black spots; yellowish brown pronotum with a light brown transverse band midanteriorly; body length 5.5 mm ..... *Xanthadalia* sp. B [Fig. 258]
- 56(54') Pronotum black and with 3 yellow spots; elytra with 2 pairs of yellow globose spots lining the sutural margins and 2 pairs in a transverse row connected to each other below the midline; humeral and apical lunules or bands broad and C-shaped; body length 6.7 mm ..... *Cheilomenes lunata* Fabricius [Fig. 259]
- 56' Pronotum brownish with or without spots; elytron with 5–6 spots ..... 57
- 57(56') Scutellar area without converging spots; elytron with 6 rounded spots in 2 longitudinal rows, paired median spots the largest, a small transverse band between anterior and median spots and a small vertical spot below midlength of elytron; body length 8.2 mm ..... *Epilachna reticulata* Olivier [Fig. 260]
- 57' Scutellar area with converging spots; elytron with 5 black spots, large median spot elongate with median constriction ..... *Chnootriba similis* Mulsant [Fig. 261]
- 58(48') Head covered by explanate anterior margin of pronotum; antenna long with funicular segment I longest; maxillary palpi with 4 segments; ovoid eyes strongly convex; pronotum expanded laterally with prominent ridges; coxa I

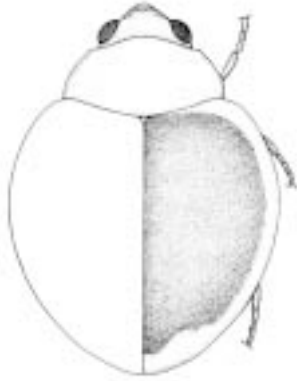


Fig. 255. *Chilocorus* sp., dorsal view (15X).

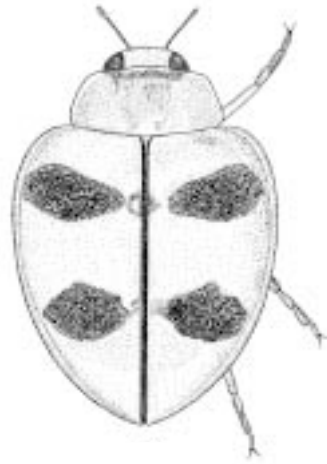


Fig. 258. *Xanthadalia* sp. B, dorsal view (7.6X).

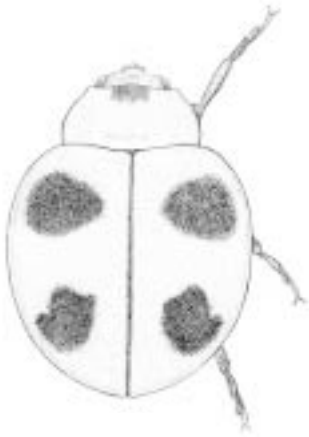


Fig. 256. *Xanthadalia effusa* Erichson, dorsal view (7.9X).



Fig. 259. *Cheilomenes lunata* Fabricius, dorsal view (5.6X).

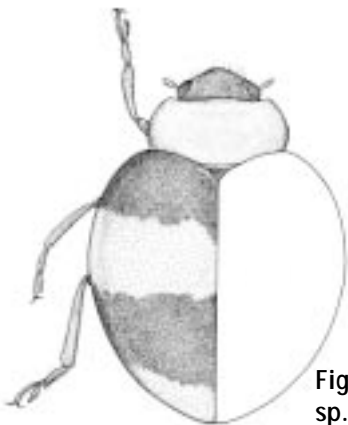


Fig. 257. *Xanthadalia* sp. A, dorsal view (8X).

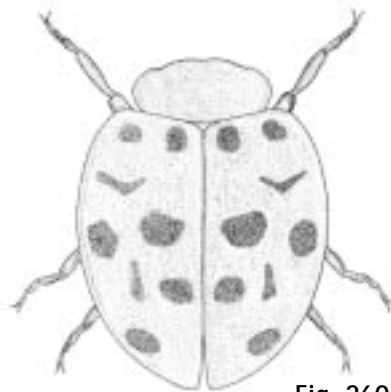


Fig. 260. *Epilachna reticulata* Olivier, dorsal view (5X).

- globular with a large triangular trochantin; elytra elongate, more than 5 times longer than pronotum, leaf-like with veins and a network of raised lines [Family **Lycidae**] ..... 59
- 58' Head not covered by explanate anterior margin of pronotum ..... 61
- 59(58) Elytra, yellow with a broad brown marginal band running just above midlength to apical one-fourth of wing apex; shoulder high; prothorax wider than long, expanded marginally, concave medially; antenna dark brown except yellowish brown segment III; head dark reddish brown except yellow brown snout; legs brown; body length 14 mm ..... *Lycus (Lycus) semiamplexus* Murray [Fig. 262]
- 59' Not as above, elytra usually with a median dark brown longitudinal band .... 60
- 60(59') Head with a moderately short snout as long as first funicular segment divided medially by a transverse furrow; pronotum bluntly pointed anteriorly and with a transverse furrow posteriorly interrupted in the middle by a longitudinal ridge; elytra narrow and slender, yellow except black apical one-fourth ..... *Lycus (Lycostomus) proboscidentis* Fabricius [Fig. 263]
- 60' Head with a long snout slightly longer than the first funicular segment without median furrow; pronotum with a small median notch anteriorly, entire blackened area bell-shaped with punctations around it; elytra almost 4 times longer than wide, midlateral with a black spot and apical one-third black ..... *Lycus (Lycostomus) sp.* [Fig. 264]
- 61(58') Elytra truncate, short and broad, with regular longitudinal striae and clothed with fine and short hairs forming spot patterns, head small, deflexed and produced anteriorly into a short snout covering the prosternum and coxa I; eyes prominently emarginate in front; pronotum narrow anteriorly and subtriangular; large pygidium exposed by truncate elytra; basal segment of tarsus III longer than total length of other segments; fore coxae contiguous; mesepimera not distinct [Family **Bruchidae**] ..... 62
- 61' Elytra entire, striae usually absent; head deeply positioned in an often transverse, subquadrate or anteriorly convex pronotum, and not covering prosternum and coxa I viewed underneath; pygidium seldom exposed; basal segment of tarsus III shorter than combined length of other segments; globular or transverse, fore coxae separated; mesepimera distinct, reaching midcoxal cavities; antennae often as long as one-half body length [Family **Chrysomelidae**] ..... 63
- 62(61) Pronotum reddish brown medially, anteriorly and posterolaterally, black subdorsally; elytra reddish brown with white hairs, base and shoulder black, midlaterally with a black triangular band and apex uniformly black; interval 2 of elytra or with a pair of black spots below scutellum and another pair in apical one-third ..... *Callosobruchus chinensis* (Linnaeus) [Fig. 265]
- 62' Pronotum dull brown with four faint black median spots; reddish brown elytra with white hairs on all intervals except black shoulder, middle and apex of intervals 8 to 10, apices of elytra with faint dark reddish brown spots ..... *Callosobruchus sp.* [Fig. 266]
- 63(61') Femur III enlarged for jumping; pronotum and elytra without spines ..... 64
- 63' Femur III not enlarged, if so, all femora similar and enlarged on apical two-thirds; pronotum with or without spines ..... 68

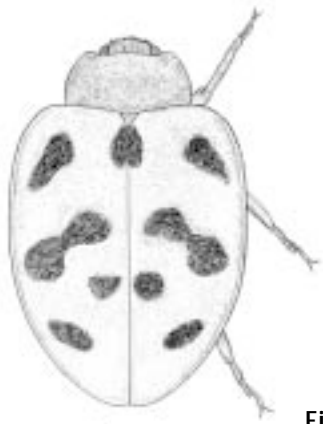


Fig. 261. *Chnootriba similis* (Mulsant), dorsal view (8.85X).

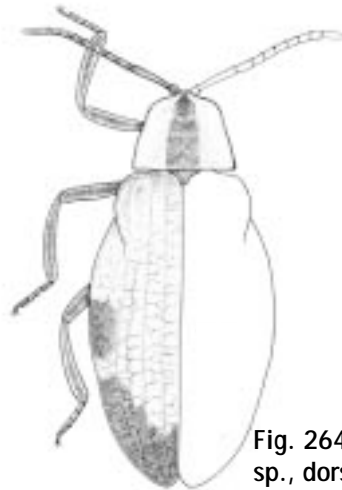


Fig. 264. *Lycus* (*Lycostomus*) sp., dorsal view (3X).

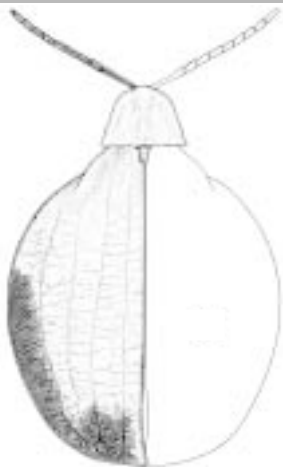


Fig. 262. *Lycus* (*Lycostomus*) *semiamplexus* Murray, dorsal view (3.6X).

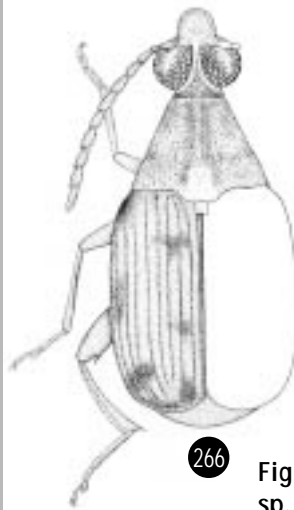


Fig. 265. *Callosobruchus chinensis* (Linnaeus), dorsal view of right elytron (7.4X).



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Fig. 266. *Callosobruchus* sp., dorsal view (17.3X).

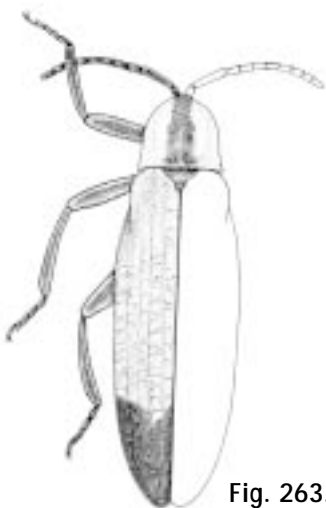
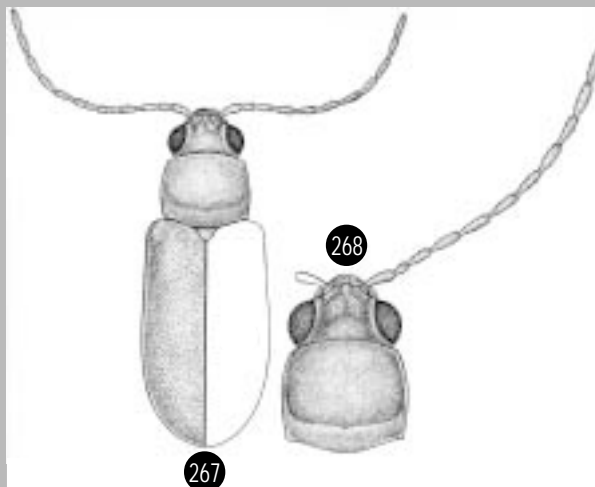


Fig. 263. *Lycus* (*Lycostomus*) *proboscideus* Fabricius, dorsal view (3.9X).

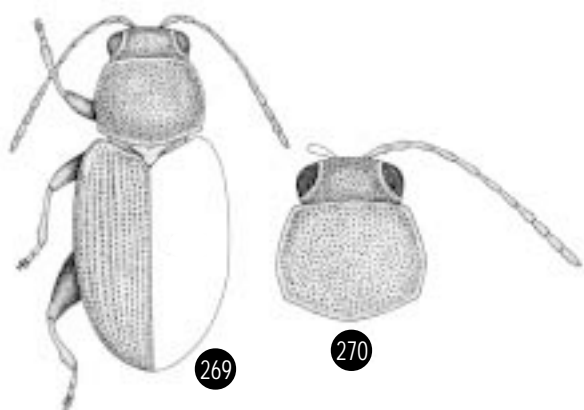


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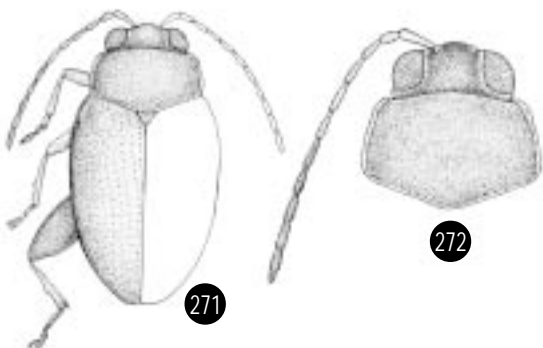
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Figs. 267–268. *Altica* sp., dorsal view (267; 8X) and dorsal view of head and pronotum (268; 15.7X).

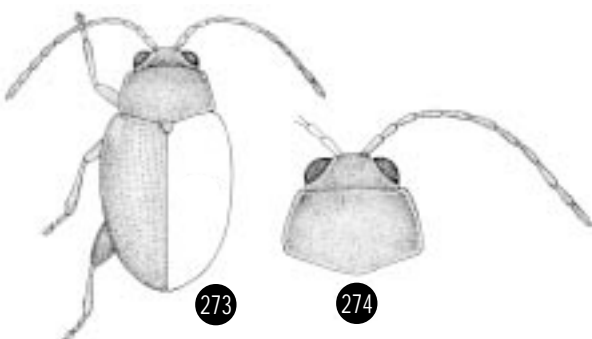
64(63)	Moderately large, at least 5 mm long; head and pronotum smooth, pronotum with a transverse groove in the posterior one-fourth; elytra finely punctated without distinct striae, venter of abdomen, sides of thorax and legs with white fine hairs ..... <i>Altica</i> sp. [Figs. 267, 268]	
64'	Small, 1.5–2.4 mm long; head and pronotum smooth to punctured; pronotum not grooved elytra on distinct puncture arranged in lines or striae ..... 65	
65(64')	Head and pronotum punctured evenly; elytra without clear rows of sutural puncture adjacent the scutellum; legs I and II reddish brown to black; femur III black; prothorax one-third wider than long, body length 2.40 mm ..... <i>Chaetocnema</i> cf. <i>abyssinica</i> Jacoby [Figs. 269, 270]	
65'	Head impunctate; pronotum moderately to finely punctured; body length less than 2 mm ..... 66	
66(65')	Pronotum finely and evenly punctured; antennal segments yellow except yellowish brown segments VII to XI; legs I and II yellow brown; femur III reddish brown with yellow tibia and tarsus; body length 1.5 mm ..... <i>Chaetocnema pusilla</i> Laboissiere [Figs. 271, 272]	
66'	Not as above ..... 67	
67(66')	Pronotum smooth except for very fine punctures; elytral puncture more pronounced; apical three segments of antennae brownish red ..... <i>Chaetocnema pulla</i> Chapuis [Figs. 273, 274]	
67'	Pronotum sparsely punctured; elytral punctures moderate but distinct, lighter than <i>C. pulla</i> ; apical 5–6 segments of antennae brownish to brownish red ..... <i>Chaetocnema</i> spp. [Figs. 275–280]	
68(63')	Pronotum and elytra with spines ..... 69	
68'	Pronotum and elytra without spines ..... 74	
69(68)	Lateral margins of pronotum each with 4 small spines, anterior 2 spines close to each other, third spine at midlength and the fourth in posterior quarter; elytra with 5 small marginal spines ..... <i>Trichispa sericea</i> Guérin-Meneville [Figs. 281, 282]	
69'	Lateral margins of pronotum with strong spines ..... 70	
70(69')	Pronotum with anterior trifurcate spine; elytron with at least 11 marginal spines and 4 spines on disc; metallic blue beetle; body length 5.5 mm ..... <i>Diclidispa viridicyanea</i> (Kraatz) [Figs. 283–285]	
70'	Pronotum with a pair of midanterior and lateral spines ..... 71	
71(70')	Apicolateral and anterior median spines of the pronotum bifurcate; femur I without ventral spines ..... 72	
71'	Three lateral spines of pronotum separated; midanterior pronotal spine with a small spine at basal front; femora I–III with ventral spines ..... 73	
72(71)	Brown; lateral margins of each elytron with 18 spines or more, dorsal plate with 13–14 prominent and black spines; antennae and legs uniformly brown; body length 4.2 mm ..... <i>Dactylispa</i> sp. A [Figs. 286, 287]	



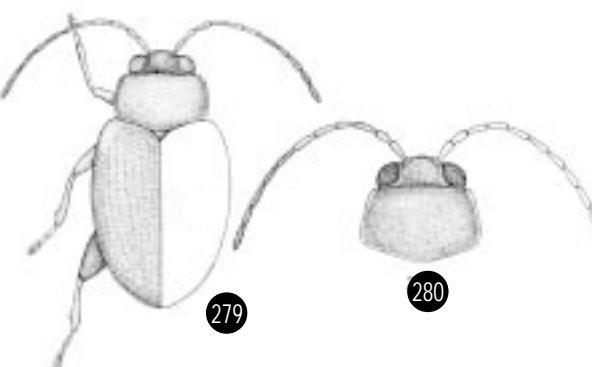
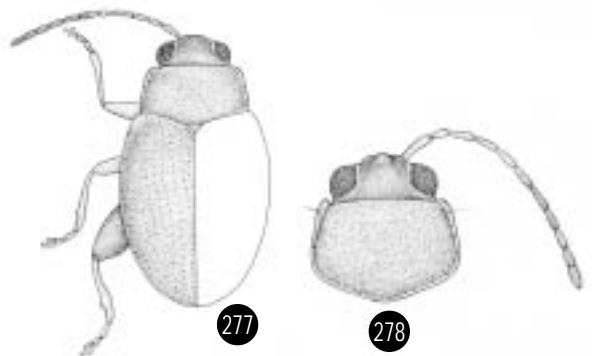
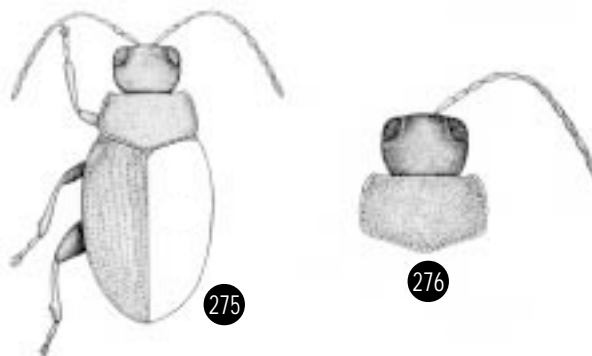
Figs. 269–270. *Chaetocnema* cf. *abyssinica* Jacoby, dorsal view (269; 17.5X) and dorsal view of head and pronotum (270; 25X).



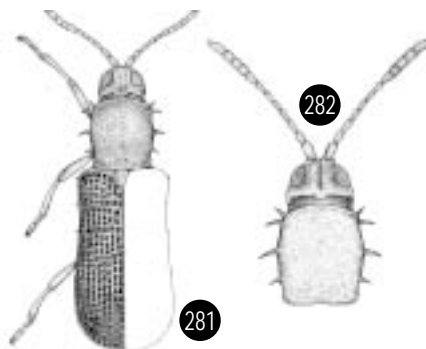
Figs. 271–272. *Chaetocnema pusilla* Laboissiere, dorsal view (271; 21.8X) and dorsal view of head and pronotum (272; 36X).



Figs. 273–274. *Chaetocnema pulla* Chapuis, dorsal view (273; 18.4X) and dorsal view of head and pronotum (274; 30X).

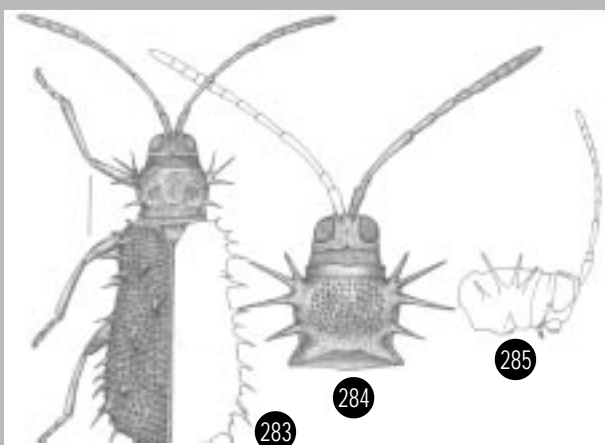


Figs. 275–280. *Chaetocnema* spp., dorsal views (275, 20X; 277, 20X; 279, 20X) and dorsal views of head and pronotum (276, 31X; 278, 31X; 280, 31X).

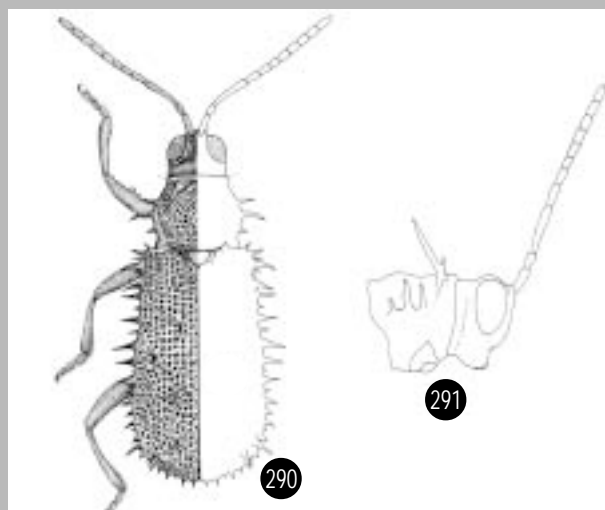


Figs. 281–282. *Trichispa sericea* Guérin-Meneville, dorsal view (281; 9.2X) and dorsal view of head and pronotum (282; 15X).

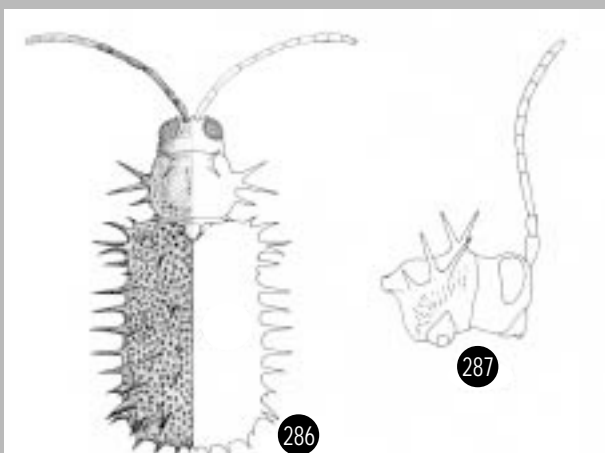




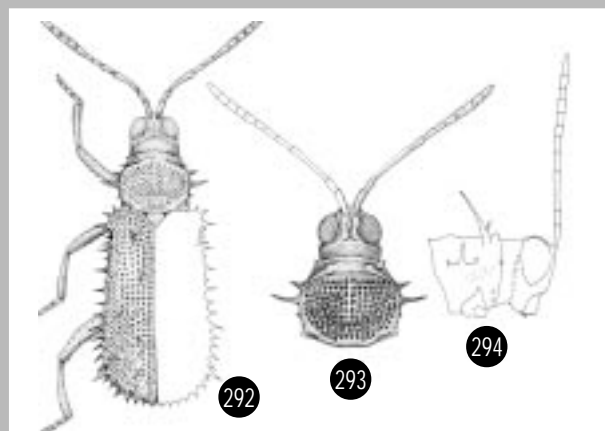
Figs. 283–285. *Dicladispa viridicyanea* (Kraatz), dorsal view (283; 7.6X) and dorsal (284; 12.7X) and lateral (285; 10X) views of the head and pronotum.



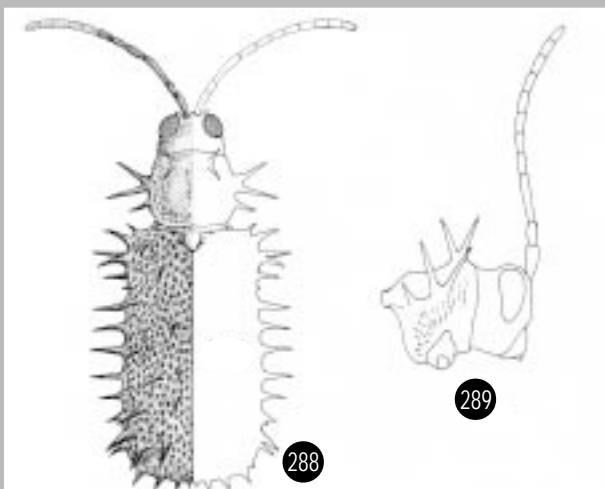
Figs. 290–291. *Dactylispa* sp. B, dorsal view (290; 5.25X) and lateral view of head and pronotum (291; 8.2X).



Figs. 286–287. *Dactylispa* sp. A, dorsal view (286; 10.2X) and lateral view of head and pronotum (287; 16.3X).



Figs. 292–294. *Dactylispa spinigera* Gyllenhall, dorsal view (292; 5.63X), and dorsal (293; 8.9X), and lateral (294; 7.9X) views of the head and pronotum.



Figs. 288–289. *Dactylispa* cf. *bayoni* Gestro, dorsal view (288; 12.4X) and lateral view of head and pronotum (289; 15X).

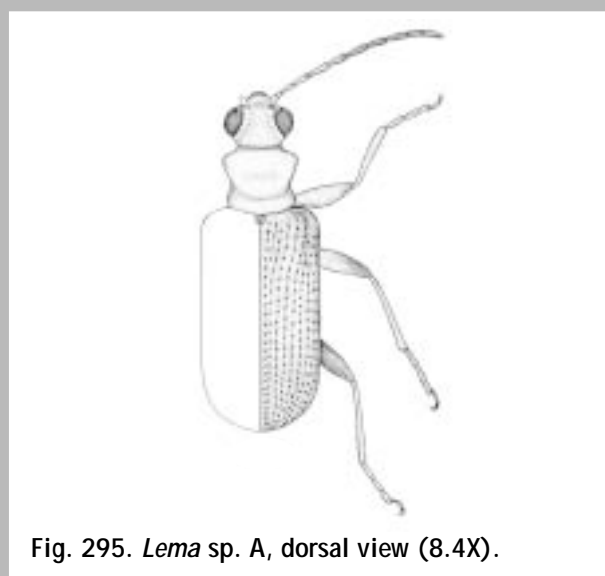


Fig. 295. *Lema* sp. A, dorsal view (8.4X).



- 72' Black; lateral margins of each elytron with 18 spines, dorsal plate with 12 prominent spines; antennae black except 5 apical brown segments; body length 3.8 mm ..... *Dactylispa* cf. *bayoni* Gestro [Figs. 288, 289]
- 73(71') Anterior of pronotum with transverse ridges extended to the slightly .. elevated plate of anteromedian dorsal spine; midlateral sinuate; venter of femora with at least 5 teeth, 5 in I, 7–8 in II and 5–6 in III; antenna black with brown apical tip; body length 8.2 mm ..... *Dactylispa* sp. B [Figs. 290, 291]
- 73' Anterior of pronotum without transverse ridges; midlateral pronotal spine pointed and strong, posterior lateral spine small; venter of femora with 2 teeth; antennae black except 5 reddish brown apical segments; body length 7 mm ..... *Dactylispa spinigera* Gyllenhal [Figs. 292–294]
- 74(68') Prothorax wider than long, sides strongly constricted at or below midlength; eyes indented above antennae; scutellum truncate apically ..... 75
- 74' Not as above; if eyes emarginated, pronotum not constricted at or below midlength ..... 81
- 75(74) Head, pronotum and elytra uniformly brown ..... 76
- 75' Head, pronotum and elytra not colored as above ..... 77
- 76(75) Body length approximately 5 mm; antennal base, head, pronotum leg I, and elytra uniformly brown; funicular segments of antennae reddish brown; labrum cleft medially; apical half of femora II and III black to reddish brown; venter and sides of thorax and abdomen black except last 2 terminal segments of abdomen ..... *Lema* sp. A [Fig. 295]
- 76' Body length 9 mm; vertex of head, pronotum and elytra brown; frons, antennae, legs and underneath of entire body black; black labrum truncate anteriorly ..... *Lema armata* Fabricius [Fig. 296]
- 77(75') Prothorax brown; elytra uniformly black to dark blue; dorsal surfaces of antennal segments I–VII blackish and brownish ventrally, rest of segments black; head black in front but brown behind the eyes; legs brown except tibia I with inner and outer dark brown longitudinal bands; coxae I & II and trochanter I–III black; tip of tibiae and tarsi reddish brown; body length 5.4 mm ..... *Lema rubricollis* Klug [Figs. 297, 298]
- 77' Prothorax black, or if brown then elytra with black spots or longitudinal bands ..... 78
- 78(77') Prothorax brown; elytra with black spots or bands ..... 79
- 78' Prothorax black ..... 80
- 79(78) Elytra with 8 spots arranged in 3 transverse rows of 2, 4, and 2 along apical one-half and a transverse band in posterior one-third; legs black to reddish brown with fine silvery white hairs; body length 6.2 mm ..... *Lema* sp. C [Fig. 299]
- 79' Elytra with a broad longitudinal black vitta emanating from the humeri and covers sutures 3–6 at midlength and 2–8 subposteriorly; femora yellowish brown except apical half of II and III black to dark reddish brown; tibiae yellowish brown, if yellow, with inner and outer longitudinal bands; body length 4.4 mm ..... *Lema* sp. D [Figs. 300, 301]

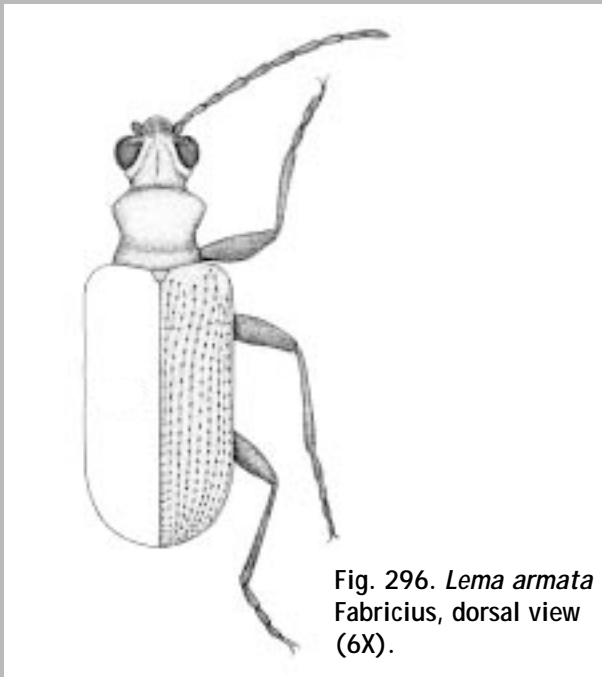
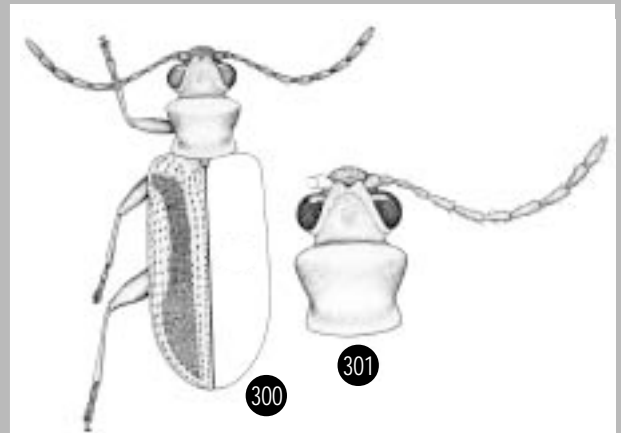
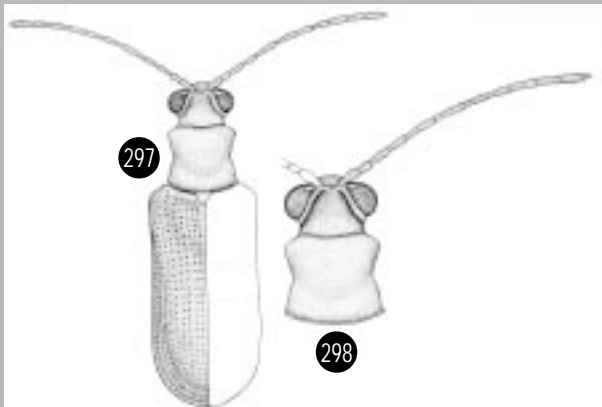


Fig. 296. *Lema armata* Fabricius, dorsal view (6X).



Figs. 300–301. *Lema* sp. D, dorsal view (300; 9.8X) and dorsal view of head and pronotum (301; 15.4X).



Figs. 297–298. *Lema rubricollis* Klug, dorsal view (297; 6.8X) and dorsal view of head and pronotum (298; 10X).

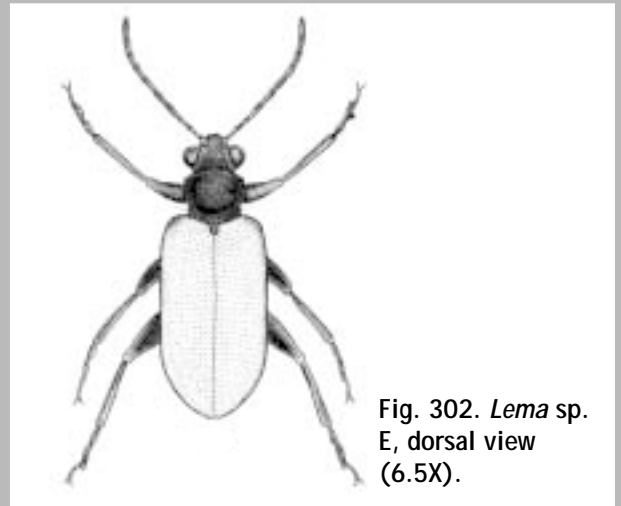


Fig. 302. *Lema* sp. E, dorsal view (6.5X).

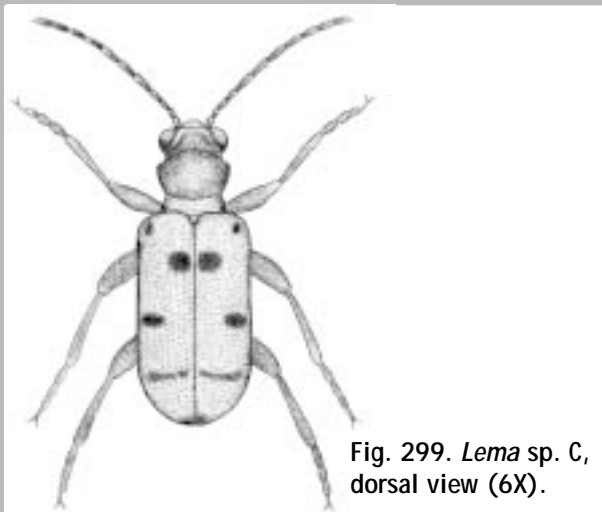


Fig. 299. *Lema* sp. C, dorsal view (6X).

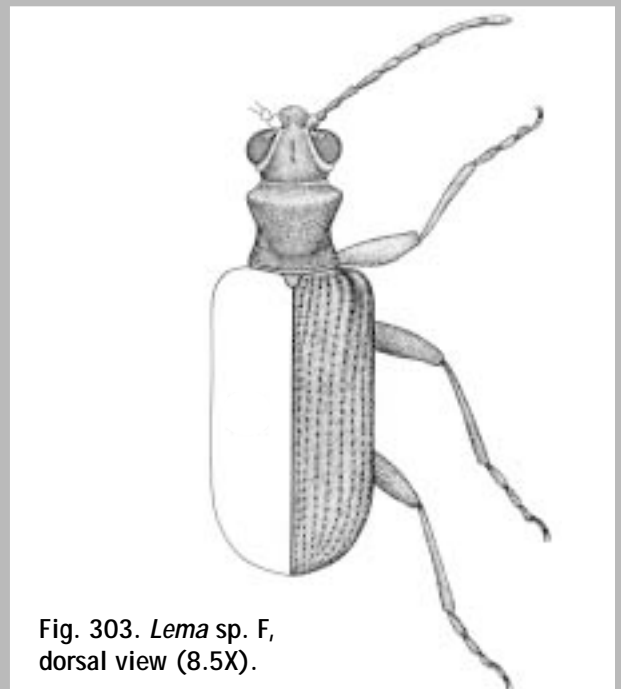


Fig. 303. *Lema* sp. F, dorsal view (8.5X).

80(78')	Pronotum smooth; head, pronotum, legs and venter of body black; antennae brownish yellow in segments I–IV and dark brownish red thereafter; elytra brown; body length 5.2 mm ..... <i>Lema</i> sp. E [Fig. 302]	
80'	Pronotum with transverse striae; entirely black except reddish brown eyes; body length 6.6 mm ..... <i>Lema</i> sp. F [Fig. 303]	
81(74')	Eyes emarginate near the bases of antennae; head somewhat hidden in dorsal aspect ..... 82	
81'	Eyes spherical; head usually visible dorsally ..... 92	
82(81)	Antenna with segments V–X wider than long; eyes narrowly notched ..... 83	
82'	Antennal segments prominently longer than wide except subglobose pedicel ..... 84	
83(82)	Head black, coarsely punctured with a slight transverse groove between the moderately swollen area and apical eye margins and extended down to the base of antennae; elytra yellow punctured with a black ovoid spot in the shoulder and a pair of reddish dark brown spots below midlength; legs and venter of entire body black with fine white hairs ..... <i>Peploptera</i> sp. [Fig. 304]	
83'	Head, pronotum, elytra, venter of entire body and legs uniformly yellow to slightly yellowish brown; eyes indented in basal one-fourth; head smooth with a Y-groove between eyes viewed frontally; elytra finely punctated with 3 longitudinal lines; tarsal claws not bifurcate ..... <i>Smaragdina</i> sp. [Fig. 305]	
84(82')	Elytra black to bluish black with prominent puncture; red pronotum and head slightly punctured coarser in the head; eyes indented at midlength; antennal scape short and rounded, anterior tip of segments III–VI globose; femora I–III red except black posterior and anterior ends; tibiae and tarsi all black; tarsal claws bifurcate subbasally ..... <i>Syagrus calcaratus</i> Fabricius [Fig. 306]	
84'	Elytra yellow, yellowish brown to reddish brown with black bands on spots . 85	
85(84')	Pronotum with a pair of black bands or vittae; elytra bear black C-shaped bands ..... <i>Cryptocephalus</i> sp. A [Fig. 307]	
85'	Without the combination of above characters ..... 86	
86(85')	Pronotum with a pair of broad lateral bands; elytra with two broad black transverse bands merged along the suture ..... <i>Cryptocephalus</i> sp. B [Fig. 308]	
86'	Entirely not as above ..... 87	
87(86')	Pronotum with 4 brown ovoid spots, inner spots larger than outer spots; elytral vittae run from shoulder to posterior two-thirds of striae V–IX ..... <i>Cryptocephalus</i> sp. C [Fig. 309]	
87'	Pronotum with or without black spots; elytra with 6 spots or broad transverse bands ..... 88	
88(87')	Pronotum without spots ..... 89	
88'	Pronotum with 2 black spots ..... 90	

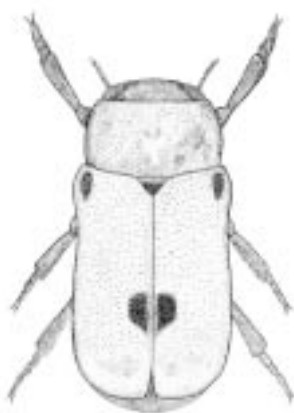


Fig. 304. *Peploptera* sp., dorsal view (5.5X).



Fig. 307. *Cryptocephalus* sp. A, dorsal view (10X).

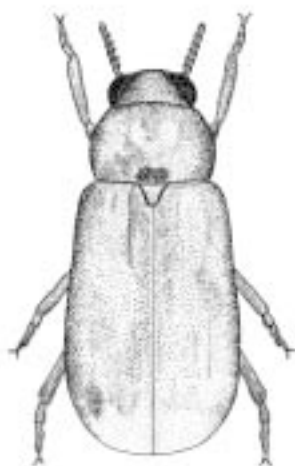


Fig. 305. *Smaragdina* sp., dorsal view (8X).



Fig. 308. *Cryptocephalus* sp. B., dorsal view (8X).

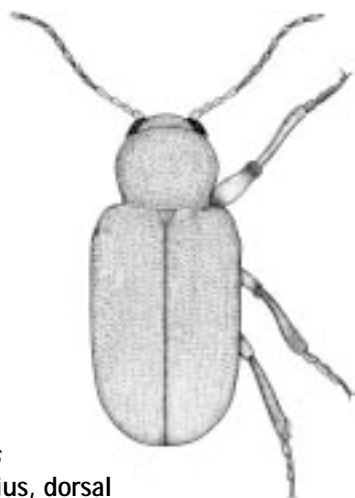


Fig. 306. *Syagrus calcaratus* Fabricius, dorsal view (6.2X).

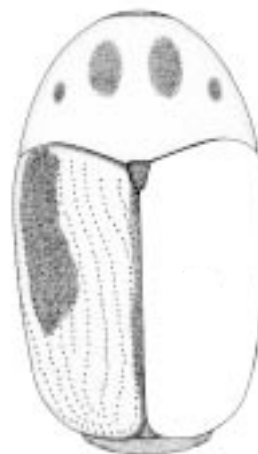


Fig. 309. *Cryptocephalus* sp. C, dorsal view (15.7X).

- 89(88) Elytra with a broad black transverse band below midlength from suture to stria 10, apical two-thirds of suture black; base of elytra black from shoulder to stria 2; scutellum black with a yellow brown spot subbasally; legs brown with reddish brown longitudinal band in femur II and black femur III except its yellow brown anterior end ..... *Cryptocephalus* sp. D [Fig. 310]
- 89' Elytra with 6 black spots, 4 subbasal and 2 midlength; scutellum black to brown; legs all yellowish brown or with a dark brown spot in femur II and reddish brown femur III with brown anterior end ..... *Cryptocephalus* sp. E [Fig. 311]
- 90(88') Elytra with a broad black transverse band below midlength and running from humerus to striae 1; scutellum black; femora II and III blackish brown; body venter from mesothorax to abdomen black ..... *Cryptocephalus* sp. F [Fig. 312]
- 90' Not as above ..... 91
- 91(90') Pronotal spots subspherical slightly shorter in distance as between eyes viewed dorsally; femur III dark reddish brown except brown anterior end ..... *Cryptocephalus* sp. G [Fig. 313]
- 91' Pronotal spots very small, barely one-half distance between eyes viewed as dorsally; femur yellowish brown or femur III black with reddish brown apex ..... *Cryptocephalus* sp. H [Fig. 314]
- 92(81') Margins of pronotum bordered but not expanded; elytra with or without spots or bands ..... 93
- 92' Margins of pronotum broadly expanded, covering the head ..... 107
- 93(92) Elytra without spots or bands ..... 94
- 93' Elytra with spots or bands ..... 99
- 94(93) Body length 11 mm; uniformly dark brown and punctured except black scutellum; scutellum punctured and rounded apically; head longitudinal groove; middle of vertex with a black spot; legs and venter of entire body black; tibiae with a dorsomedian ridge and two grooves ..... *Bupachytoma* sp. [Figs. 315, 316]
- 94' Smaller species, less than 8 mm long ..... 95
- 95(94') Pronotum yellow with or without spots; elytra bluish violet to bluish green ..... 96
- 95' Pronotum and elytra yellow to yellowish brown without spots ..... 97
- 96(95) Pronotum uniformly yellow, with a transverse groove below midlength; scutellum yellow; elytra finely punctated and dark bluish violet; antennal scape slightly swollen; labial palp swollen and dark brown; venter of entire body yellow; leg dark brownish red with yellow basal one-half of femur ..... *Asbecesta cyanipennis* Harold [Figs. 317, 318]
- 96' Pronotum with a median ovate brownish red spot and one each in the mid-lateral area, subanterolateral pit present near the base of lateral spot; scutellum yellow with black apical one-half; elytra bluish green and clothed with white hairs; antenna slender; labial palp slender; venter of body yellow except brown metasternite ..... *Apophyllia chloroptera* Thomson [Fig. 319]



Fig. 310. *Cryptocephalus* sp. D, dorsal view (14.2X).

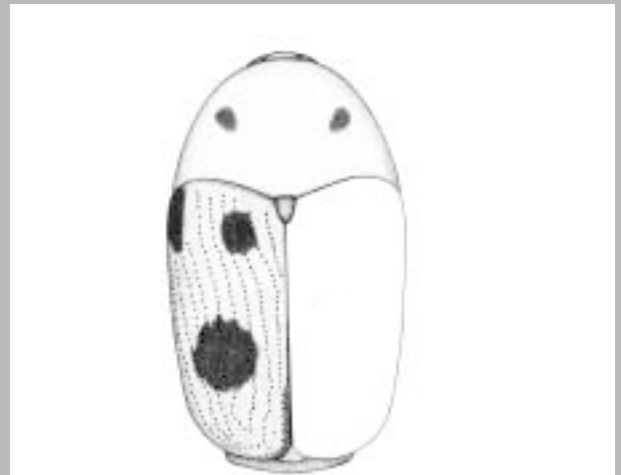


Fig. 313. *Cryptocephalus* sp. G, dorsal view (11.6X).

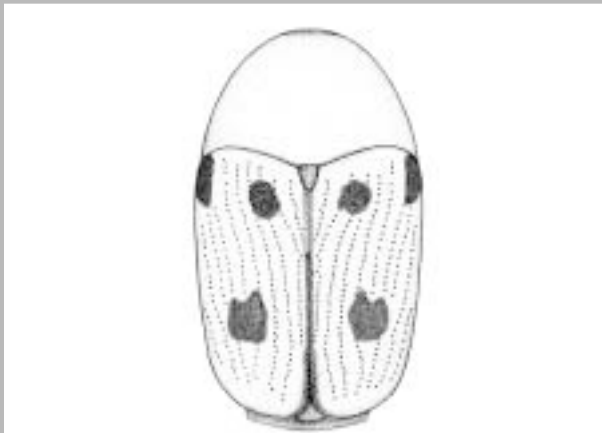


Fig. 311. *Cryptocephalus* sp. E, dorsal view (11.9X).

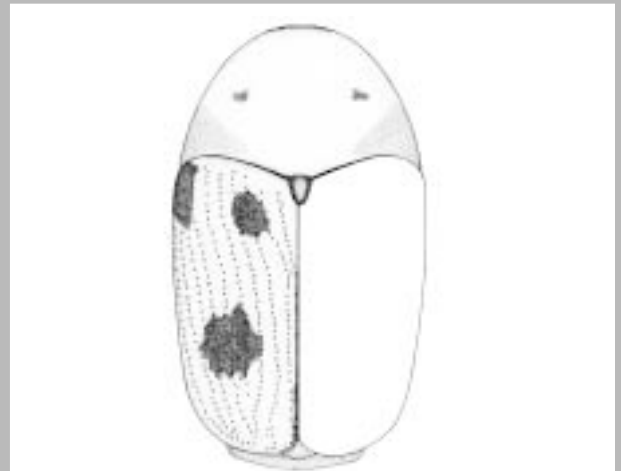
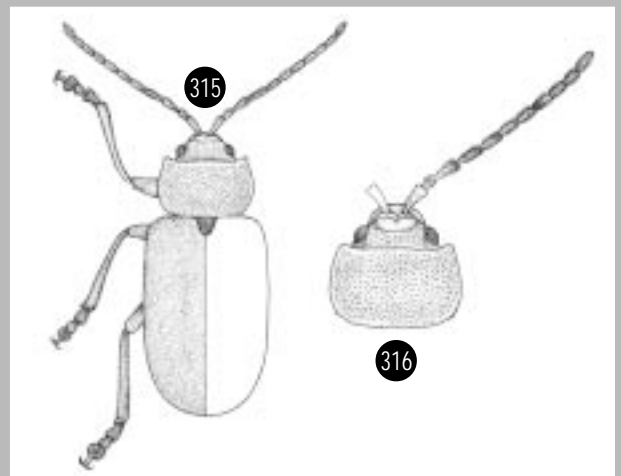


Fig. 314. *Cryptocephalus* sp. H, dorsal view (13X).

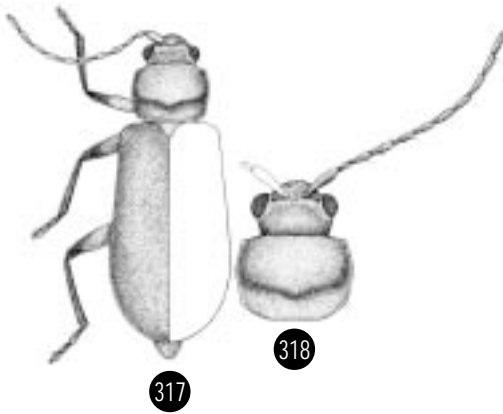


Fig. 312. *Cryptocephalus* sp. F, dorsal view (12.8X).



Figs. 315–316. *Bupachytoma* sp., dorsal view (315; 3.2X) and dorsal view of head and pronotum (316; 3.75X).

- 97(95') Head with a deep cavity on vertex, center of cavity with an elevated brown subtriangular plate; pronotum with arcuate transverse groove at midlength and densely punctured; antennae yellow with large scape, slender segment III–XI; venter of body yellow brown ..... *Lamprocopa occidentalis* Weise [Fig. 320]
- 97' Not exactly as above ..... 98
- 98(97') Prothorax strongly convex, smooth and rounded posteriorly and laterally; head with a transverse groove above and a ridge between antennal base, concealed by the pronotum viewed dorsally; elytra finely punctated; legs yellow except brownish part of tibiae and tarsi; claws with a very small inner teeth ..... *Ootheca mutabilis* Sahlberg [Fig. 321]
- 98' Prothorax subrectangular with a transverse groove at midlength, deep concave cavity present in middle of the groove; head without distinct ridge or groove above and between antennal base, entire head visible dorsally; elytra finely punctured with moderately thick long hairs near the shoulder; legs yellowish brown with bifurcate claws ..... *Aulacophora africana* (Weise) [Figs. 322, 323]
- 99(93') Elytra with two black transverse bands or 4 yellow globose spots ..... 100
- 99' Elytra with two black longitudinal vittae ..... 104
- 100(99) Head with a dark brown spot on vertex; pronotum with or without two anterolateral and a median dark brown spots but always with a transverse groove below middle; black scutellum with yellow basal one-third; elytra with a broad transverse black band in anterior one-third and posterior one-third; lateral side of thorax with a dark brown band running dorsal of coxae I–III ..... *Leptaulaca fissicollis* Thomson [Fig. 324]
- 100' Head and pronotum without dark brown spots ..... 101
- 101(100') Yellow pronotum with a transverse groove at midlength; triangular scutellum yellow; elytra with a broad black transverse band anteriorly and a subcircular or ring black spot posteriorly, inner portion of ring adjacent to the suture with a posteriorly projected spine; entire body, venter and legs yellow; antennal segment III as long as or slightly shorter than segment IV ..... *Diacantha albidicornis* Weise [Fig. 325]
- 101' Pronotum without transverse groove; elytra without subposterior spine; antennal segment III clearly shorter than IV; tibial spur of leg III strong ..... 102
- 102(101') Pronotum and head uniformly shiny red; elytra black with 4 whitish yellow subglobular spots, 2 each anteriorly and posteriorly; scutellum triangularly red; antenna yellow except brownish apical segments; leg yellowish brown ..... *Monolepta elegans* Allard [Figs. 326, 327]
- 102' Not as above; elytra usually yellow with two black transverse bands ..... 103
- 103(102') Elytra with transverse broad black bands anteriorly and submedially, and a brownish black spherical spot posteriorly; segment IV of antenna more than 2 times longer than III ..... *Monolepta* sp. A [Fig. 328]
- 103' Elytra with a transversely broad black band anteriorly and behind midlength, posteriorly without blackish brown spot; segment IV of antenna 1.5x longer than segment III ..... *Monolepta* B [Figs. 329, 330]



Figs. 317–318. *Asbecesta cyanipennis* Harold, dorsal view (317; 7X) and dorsal view of head and pronotum (318; 11X).

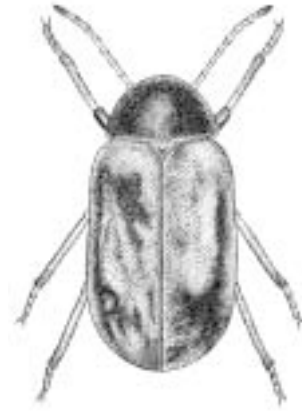


Fig. 321. *Ootheca mutabilis* Sahlberg, dorsal view (5.7X).

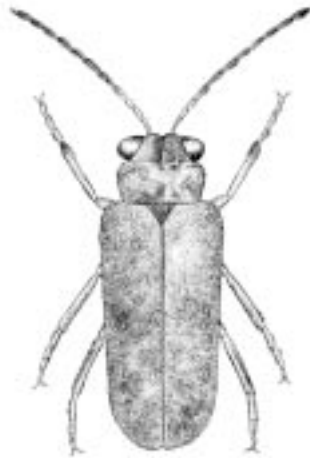
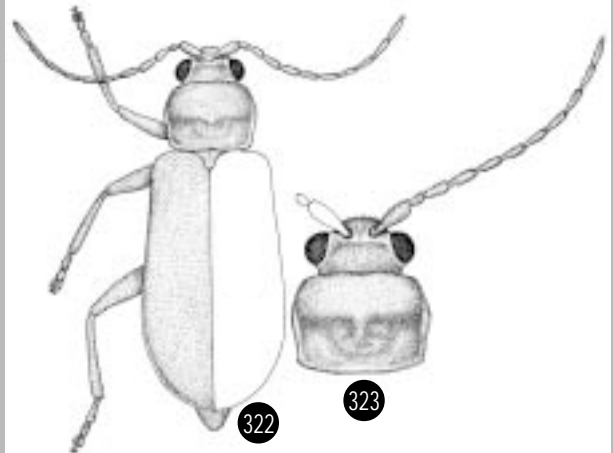


Fig. 319. *Apophyllia chloroptera* Thomson, dorsal view (6.3X).



Figs. 322–323. *Aulacophora africana* (Weise), dorsal view (322; 6.4X) and dorsal view of head and pronotum (323; 8.2X).

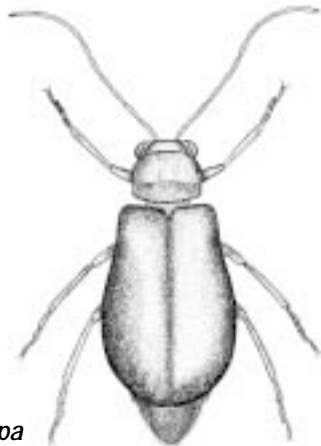


Fig. 320. *Lamprocopa occidentalis* Weise, dorsal view (6.13X).

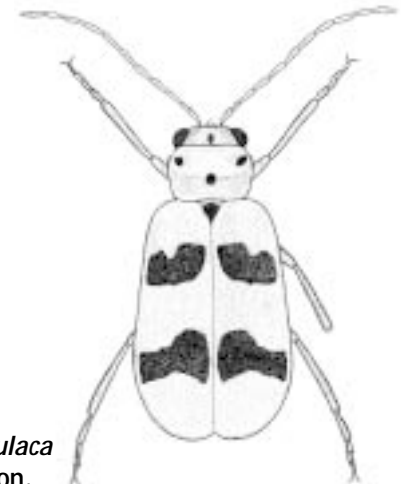


Fig. 324. *Leptaulaca fissicollis* Thomson, dorsal view (6.4X).



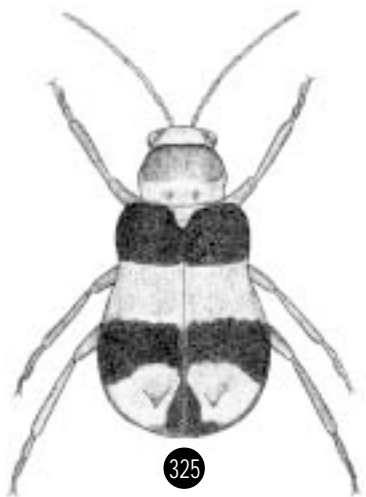
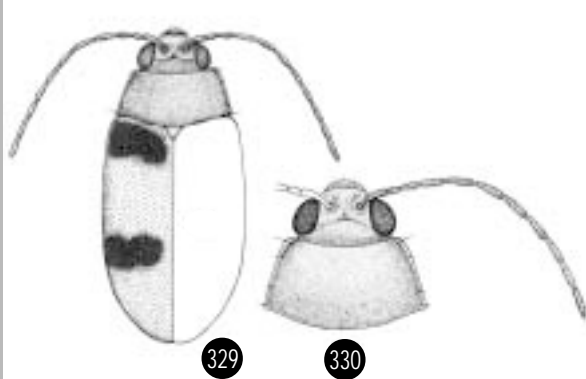
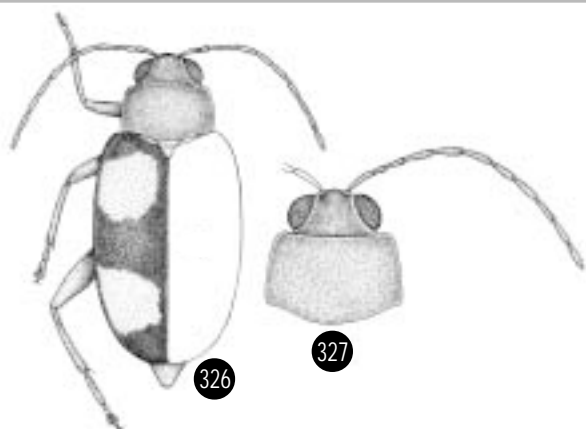


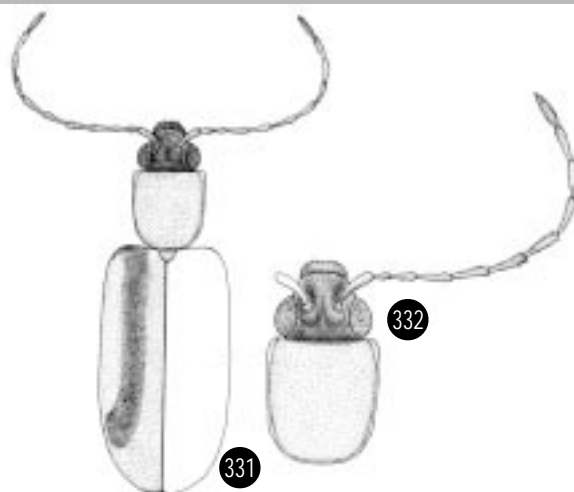
Fig. 325. *Diacantha albidicornis* Weise, dorsal view (6X).



Figs. 329–330. *Monolepta* sp. B, dorsal view (329; 9.3X) and dorsal view of head and pronotum (330; 19X).



Figs. 326–327. *Monolepta elegans* Allard, dorsal view (326; 8X) and dorsal view of head and pronotum (327; 18X).



Figs. 331–332. *Medythia* cf. *quaterna* (Fairmaire), dorsal view (331; 12X) and dorsal view head and pronotum (332; 19X).

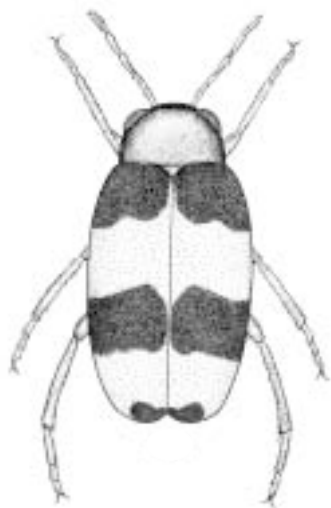
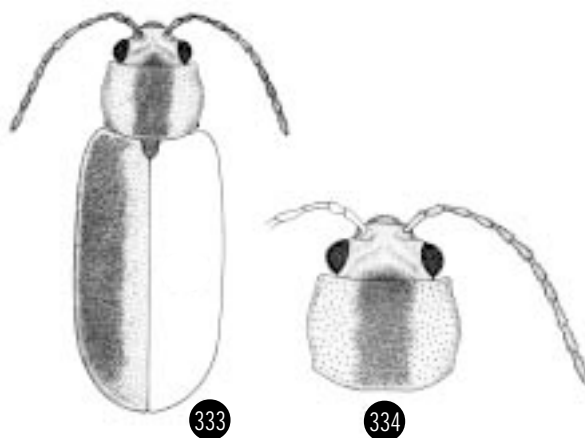
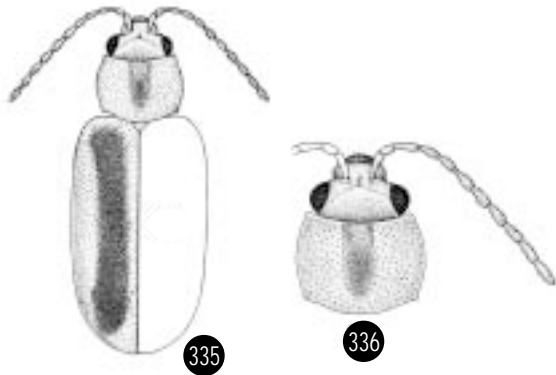


Fig. 328. *Monolepta* sp. A, dorsal view (10X).

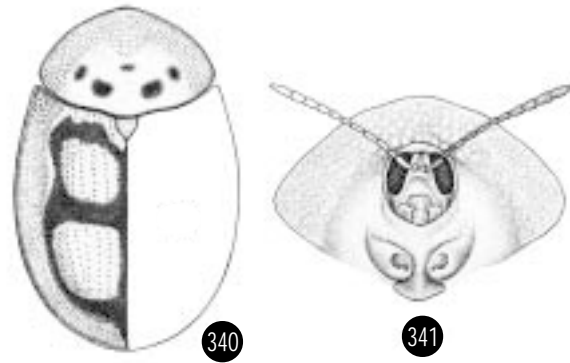


Figs. 333–334. *Medythia* sp. A, dorsal view (333; 15X), and dorsal view of head and pronotum (334; 24X).

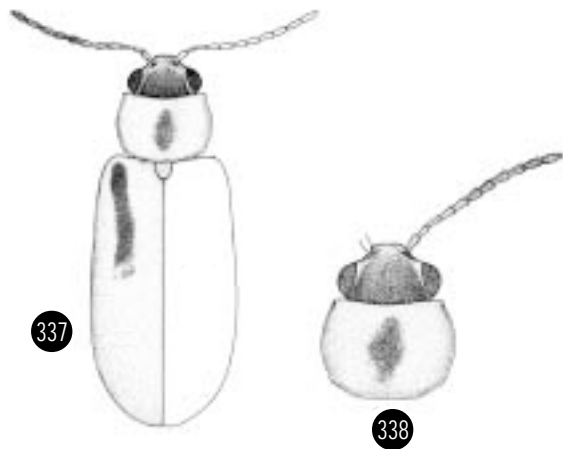
- 104(99') Pronotum brown, without spots or bands, as long as wide; head black with an elevated process between antennal sockets bisected in the middle by a longitudinal groove; antenna blackish brown except yellow segments IX–X and inner apical one-half of scape; elytra with a lateral and dorsomedian longitudinal black band connected to each other in the shoulder; leg blackish brown to dark reddish brown except yellow basal one-half of femora I–III .....  
..... *Medythia* cf. *quaterna* (Fairmaire) [Figs. 331, 332]
- 104' Pronotum with a median dark brown to black band extended on to vertex of head and wider than long ..... 105
- 105(104') Median vitta of pronotum reaching margins, slightly wider anteriorly; antenna yellow except brownish segments V–XI; vitta on elytra narrower towards the shoulder and wider posteriorly, entire elytra with very fine punctations .....  
..... *Medythia* sp. A [Figs. 333, 334]
- 105' Not as above ..... 106
- 106(105') Median vitta of pronotum narrowed posteriorly but not reaching the posterior margin; vitta on each elytron brownish black, slightly concave at midlength and rounded posteriorly, entire elytron punctated; antenna brownish yellow, darker towards apices of VIII–XI ..... *Medythia* sp. B [Figs. 335, 336]
- 106' Median mark of pronotum ovoid and dark brown; elytral longitudinal band up to midlength only, punctures moderately fine; antennae yellow in segments I–V and brownish yellow in VI–XI ..... *Medythia* sp. C [Figs. 337, 338]
- 107(92') Body almost parallel-sided with 6–25 black spots on each elytron, 25 spots arranged in 4 longitudinal rows; humeral black spot always present; spherical punctures in the margins of pronotum and elytra without pattern; frons reddish brown forming a C-shaped ridge below antennal bases; antennae black except reddish brown segments I–V; legs and venter of thorax black .....  
..... *Aspidomorpha nigrosparsa* (Boheman) [Fig. 339]
- 107' Elytron without spots ..... 108
- 108(107') Pronotum with 4 black concavely arranged subspherical spots; elevated portion of elytra with 2 pairs of subglobose yellow spots in a black background or a B-band with brownish yellow margins in each elytron; antenna yellowish brown except black segments VIII–XI; legs black .....  
..... *Aspidomorpha areata* Klug [Figs. 340, 341]
- 108' Pronotum without black spots ..... 109
- 109(108') Elytra with a broad brownish red transverse band, transparent areas C-shaped and elevated near the scutellum; segment X of antenna reddish brown dorsally and yellow brown ventrally, segment XI black with a yellow patch apicoventrally; underneath of body yellow; legs yellowish brown .....  
..... *Aspidomorpha* cf. *dissentanea* Boheman [Figs. 342, 343]
- 109' Not as above ..... 110
- 110(109') Expanded part of pronotum and elytra transparent and flattened; antenna yellow except reddish brown terminal segment with yellowish tip; venter of body and legs yellow to pale yellow brown .....  
..... *Aspidomorpha dissentanea* Boheman [Fig. 344]



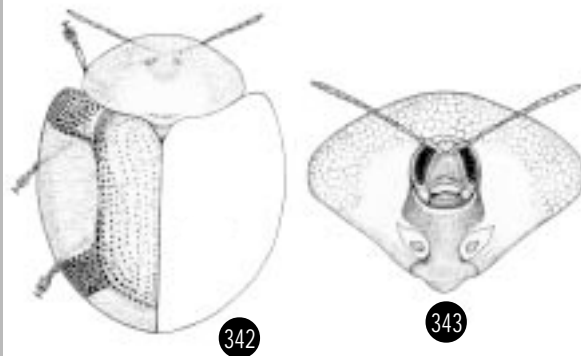
Figs. 335–336. *Medythia* sp. B, dorsal view (335; 15X) and dorsal view of head and pronotum (336; 22.5X).



Figs. 340–341. *Aspidomorpha areata* Klug, dorsal view (340; 5.5X) and frontal view head (341; 19X).



Figs. 337–338. *Medythia* sp. C, dorsal view (337; 13X) and dorsal view of head and pronotum (338; 21X).



Figs. 342–343. *Aspidomorpha* cf. *dissentanea* Boheman, dorsal view (342; 4.6X) and frontal view of head (343; 12X).

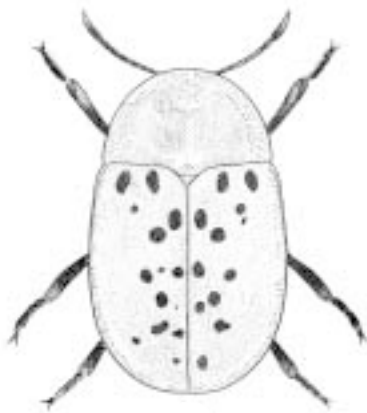


Fig. 339. *Aspidomorpha nigrosparsa* (Boheman), dorsal view (4.3X).

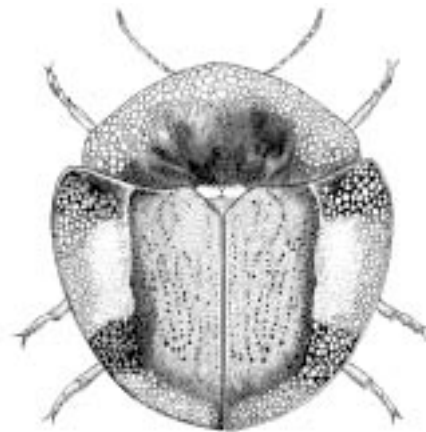


Fig. 344. *Aspidomorpha dissentanea* Boheman, dorsal view (4.7X).

110'	Not as above .....	111
111(110')	Elytra brownish yellow with expanded parts sloping downwards, without black spots; head yellowish brown with a swollen frons; antenna brownish yellow except black terminal segment with yellow tip; venter of body and legs pale yellow brown ..... <i>Aspidomorpha obovata</i> Klug [Fig. 345]	
111'	Green except yellowish brown inner area of pronotum and humeral area of pronotum; antenna yellowish green with reddish brown terminal segment; frons with a bluntly rounded structure below antennal base; venter of entire body yellowish brown ..... <i>Cassida</i> sp. [Figs. 346, 347]	

## Order Hemiptera

*Planthoppers, treehoppers, froghoppers, leafhoppers, and bugs*

1	Beak arises from the back of head .....	2
1'	Beak arises in front of head extending back to the ventral side of thorax ....	25
2(1)	Coxa II elongated and separated; antenna on sides of head underneath the eyes; two anal veins in fore wing apically forms a Y-shaped vein .....	3
2'	Coxa II short and closed together; antenna on front of head between eyes; anal area of fore wing without a Y-shaped vein .....	6
3(2)	Head not prolonged anteriorly; tibia III with a broad movable apical spur [Family <b>Delphacidae</b> ] .....	7
3'	Head prolonged anteriorly, if not frons with 2 or 3 ridges; median ocellus absent [Family <b>Dictyopharidae</b> ] .....	4
4(3')	First tarsal segment of leg III with at least 3 spines; propleuron and mesonotum dark brown to black; tegula dark brown; paramere of male genitalia bifurcate apically ..... <i>Nilaparvata maeander</i> [Figs. 348–350]	
4'	Not as above; tegula whitish yellow .....	5
5(4')	Fore wing with a broad band in the lower apical one-half; paramere of male genitalia with a small inner tooth and a moderately slender and pointed tip ... ..... <i>Sogatella kolophon</i> (Kirkaldy) [Figs. 351–353]	
5'	Fore wing without band; paramere of male genitalia with oblique apical ends directed to each other ..... <i>Tagosodes cubanus</i> (Crawford) [Fig. 354]	
6(2')	Head prolonged anteriorly, 3× longer than wide, median area with a broad groove; pronotum anterolaterals squarely cut, vertex with a short white median ridge; node yellowish brown ovoid, enclosing 3 veins close to each other; fore wing with 23 apical cells; tibia III with 4 equally spaced spines ..... ..... <i>Centromeriana</i> sp. [Fig. 355]	
6'	Front of head short, slightly shorter than length of eyes, median groove with 3 ridges; anterolaterals of pronotum moderately concave, vertex with 2 grooves; node black to dark reddish brown, subtriangular enclosing two veins almost coalesce apically; fore wing with 21 apical cells; tibia III with 5 spines ..... ..... <i>Philotheria discalis</i> (Walker) [Fig. 356]	

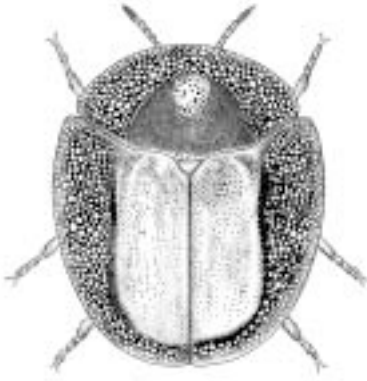
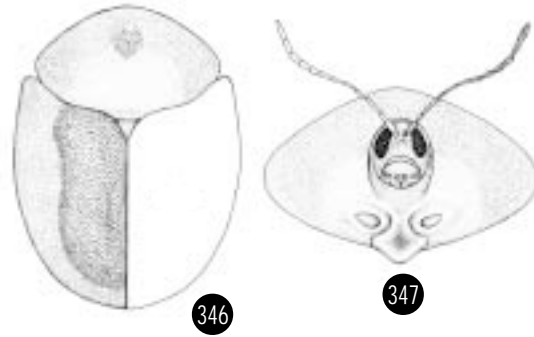
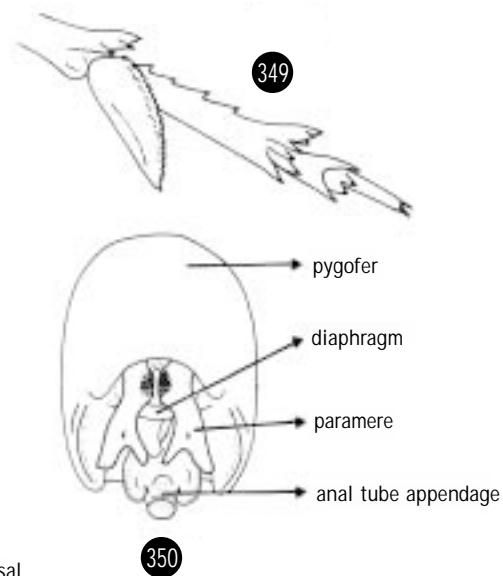
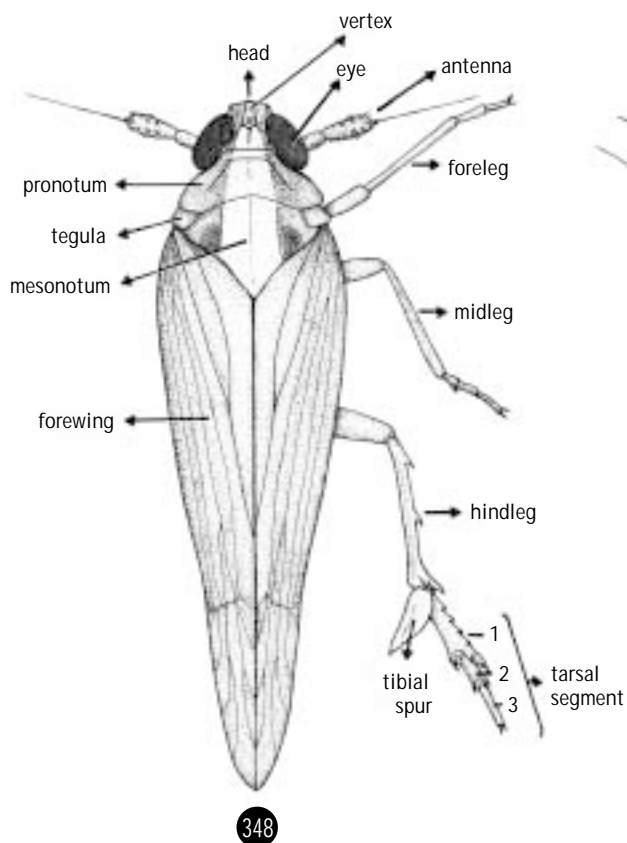


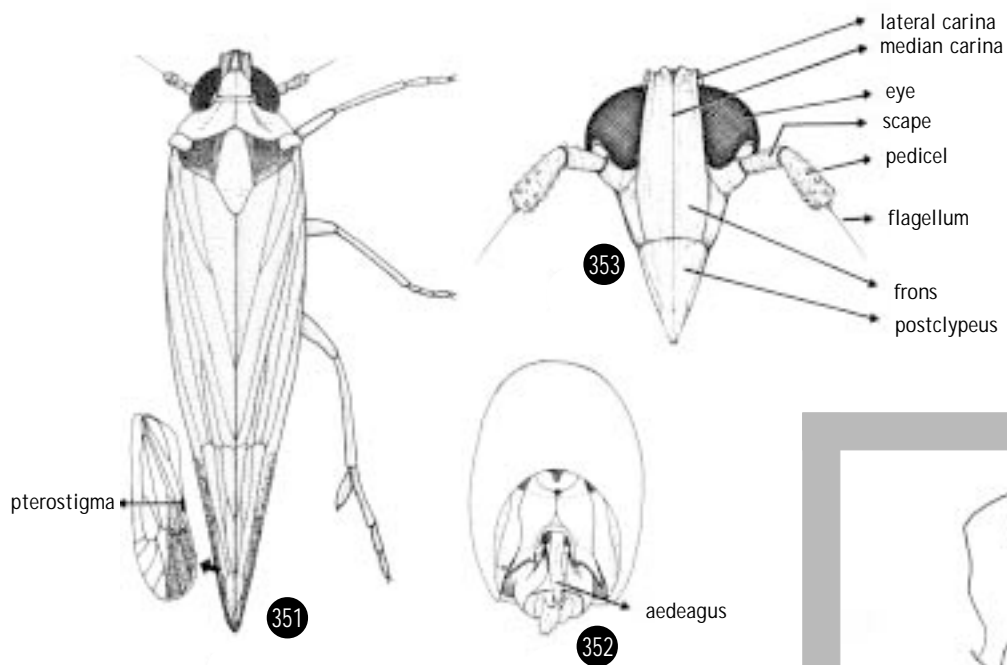
Fig. 345. *Aspidomorpha obovata* Klug, dorsal view (5.6X).



Figs. 346–347. *Cassida* sp., dorsal view (346; 8.2X) and frontal view (347; 22X).



Figs. 348–350. *Nilaparvata maeander* Fennah, dorsal view (348; 24.3X), tibial spur in leg III (349; 65X), and male genitalia (350; 120X).



Figs. 351–353. *Sogatella kolophon* (Kirkaldy), dorsal view (351; 21X), male genitalia (352; 60X), and frontal view of head (353; 34X).



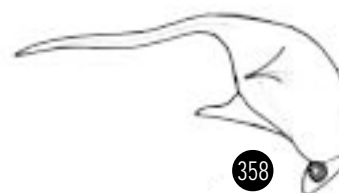
Fig. 354. *Tagosodes cubanus* (Crawford), paramere of male genitalia (88X).



Fig. 355. *Centromeriana* sp., dorsal view of head and pronotum (6X).



Fig. 356. *Philotheria discalis* (Walker), dorsal view of head and pronotum (9.7X).



Figs. 357–358. *Tricoceps tenuosus* Capener, dorsal view (357; 8.5X) and lateral view of head and pronotum (358; 7X).

- 7(3) Pronotum ornamented posteriorly extended over the abdomen; eyes underneath the posterior lateral depression of pronotum [Family **Membracidae**] .... 8
- 7' Pronotum not ornamented, short; eyes not as above ..... 11
- 8(7) Pronotum densely punctured, strongly rounded dorsally, lateral horns sharply pointed and slender posterior horn acute almost reaching apex of fore wings; posterior horn with a dorsal and two lateral ridges; fore wing with a brown triangular band passing through the largest ovoid anal cell; black species with yellowish tarsus; body length 66 mm ..... *Tricoceps tenuosus* Capener [Figs. 357, 358]
- 8' Pronotal lateral horns broad and leaf-like ..... 9
- 9(8') Pronotum and head punctured without spines, covered with short fine white hairs; vertex short not expanded in front of eyes, lateral notch dorsal of antennal base absent; ocelli closer to eyes than to each other; fore wing transparent without brown marks, both ends of costal area with reddish brown elongated band; body length 5.5 mm ..... *Leptocentrus nubianus* Capener [Fig. 359]
- 9' Pronotum and head with small spines ..... 10
- 10(9') Lateral horns of pronotum short, hardly longer than height of pronotum in frontal view, apex with 4 teeth; posterior horn with a dorsobasal tubercle, midlength concave and serrated, apical one-third broad and blade-like with a pointed tip; fore wing reddish brown basally and at apex of costal vein, apical one-fourth with a brown basal band; tibiae and tarsi dark reddish brown; body length 6 mm ..... *Platybelus* sp. A [Fig. 360]
- 10' Lateral horns of pronotum much longer than height of pronotum in dorsal view, leaf-like with a slightly concave tip and a subapical notch; posterior horn thinly blade-like and strongly C-shaped with peg-like teeth ventrally; fore wing mottled brown with brown costal vein; tibiae and tarsi yellow; body length 6 mm ..... *Platybelus* sp. B [Fig. 361]
- 11(7') Coxa III conically short; tibia III with 1–2 stout spines, apex with a ring of spines [Family **Cercopidae**] ..... 12
- 11' Coxa III transverse; tibia III with an articulated row of small spines [Family **Cicadellidae**] ..... 15
- 12(11) Anterior margin of flat head widely rounded, 3 black spots at midlength and a subquadrate plate below the spots; eyes ovoid, reaching lateral margins of the anteriorly convex and posteriorly wedge-shape pronotum; ocelli on a flat plane widely separated; frons and clypeus slanted viewed laterally; scutellum brownish, flat with a pointed yellow apex and a median longitudinal yellow band; legs uniformly brown to yellowish brown, tibia III with a subbasal, subapical, and apical spines; apex with 15 spines in 2 transverse rows; body generally brownish, length 10.60 mm ..... *Poophilus* sp. [Fig. 362]
- 12' Not as above; usually red or orange and yellow with black bands; pronotum hexagonal ..... 13

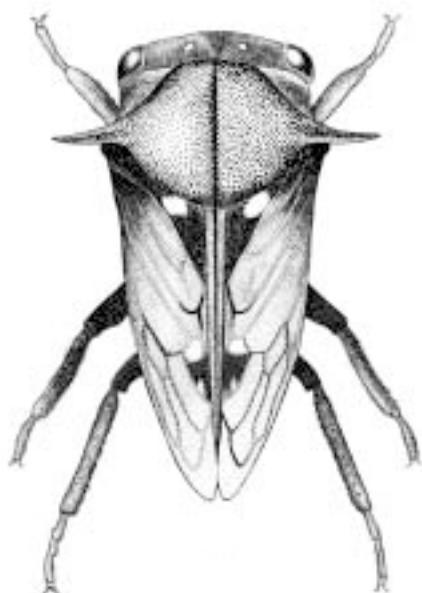


Fig. 359. *Leptocentrus nubianus* Capener, dorsal view (10X).



Fig. 362. *Poophilus* sp., dorsal view of head and pronotum (9.2X).

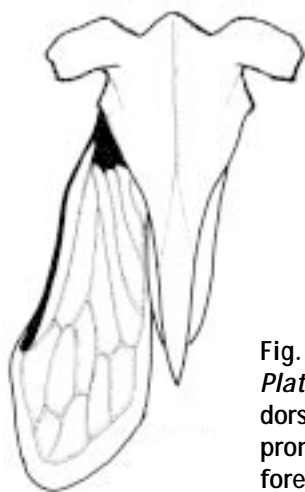


Fig. 360. *Platybelus* sp. A, dorsal view of pronotum and left fore wing (9.7X).



Fig. 361. *Platybelus* sp. B, lateral view of head and pronotum (9.4X).

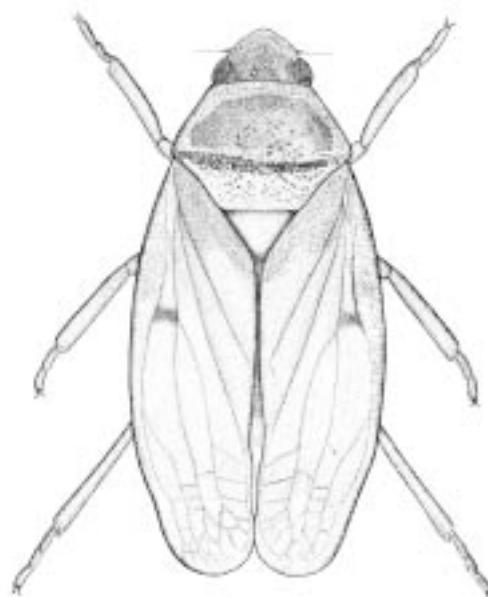


Fig. 363. *Locris rubra* Fabricius, dorsal view (5.8X).



- 13(12') Red with transverse brown band in posterior pronotum, oblique reddish brown band in the fore wing, reddish brown spot in inner one-third of corium and clavus; ocelli on a tubercle closer to each other, head dorsally red and black; frons swollen and rounded, pronotum with straight anterior and lateral black margins, posterior one-third coarsely punctured; scutellum red; legs I and II black with reddish brown apices of femora; tibia III red with black anterior end, dark reddish brown basal one-half and a spine below midlength; body length 11 mm ..... *Locris rubra* Fabricius [Fig. 363]
- 13' Not as above; anterior margins of head always yellow ..... 14
- 14(13') Pronotum yellow with a large black disc, posterior one-third moderately punctured; fore wing red in apical one-third, orange yellow in basal two-thirds with a large black band basally and a small brown spot in basal one-third of corium; femora I and II black with yellow apices, tibiae I and II yellow outside and black to dark reddish brown inside; tibia III dark reddish brown with a spine below midlength; body length 10 mm ..... *Locris* sp. [Fig. 364]
- 14' Pronotum black with humeral band transversely broad and yellow or reduced to 4 spots; fore wing yellow with black apical one-third and shades of black spots in basal one-third; tibia II with red median band; tibia III black in basal one-half and red in apical one-half; body length 10.50 mm ..... *Locris maculata maculata* Fabricius [Fig. 365]
- 15(11') Large, 8–10 mm; white to pale green leafhopper with swollen frontoclypeus; ocelli closer to the posterior margin of vertex than to anterior margin ..... 16
- 15' Smaller, less than 7 mm; frontoclypeus not swollen; ocelli closer to anterior margin of vertex ..... 18
- 16(15) Pale green leafhoppers; vertex more pointed with a rounded black spot between ocelli; junction of face and vertex without the central spot, brown striations very faint or absent ..... *Cofana unimaculata* (Signoret) [Fig. 366]
- 16' White leafhoppers; vertex rounded, median apical black spot and prominent brown striations present ..... 17
- 17(16') Vertex with a black spot between ocelli; pronotum smooth, without a longitudinal median black band extended to scutellum ..... *Cofana spectra* (Distant) [Fig. 367]
- 17' Vertex with two black spots aligned to the anterior median spot and median longitudinal band of pronotum and scutellum; posterior two-thirds of pronotum transversely striated ..... *Cofana jedarfa* Young [Fig. 368]
- 18(15') Green to dark green or yellowish green leafhoppers with or without black bands in the fore wings ..... 19
- 18' Wings tawny, veins normally brownish ..... 24
- 19(18) Fore wing green except brownish apical one-third, apical cells, with white round spot; vertex flat and anterior ridge between face and vertex prominent .. *Hecalus* sp. [Figs. 369, 370]
- 19' Fore wing without white spot on apical cells; anterior ridge not distinct ..... 20