

## Generic Key to the Known Larvae of the Cucujidae, Passandridae, and Silvanidae of America North of Mexico (Coleoptera)

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### Abstract

Illustrated generic identification keys are presented to the known larvae of Cucujidae, Passandridae, and Silvanidae occurring in America north of Mexico.

### Introduction

With the exception of a few stored products pests in the Laemophloeinae and Silvaninae, and a few large, common forms belonging to genera such as *Cucujus* Fabricius, *Uleiota* Latreille, and *Telephanus* Erichson, the larvae of very few cucujids or silvanids have been described or illustrated. Existing descriptions and illustrations often are old and not very useful taxonomically.

Previously published larval keys to genera of Cucujidae and related families include Peyerimhoff (1902), which covers seven genera still assigned to this group of families; Bøving (1921), which keys out the subfamilies and five of the genera dealt with here; and Cutler (1971), which differentiates four species of stored products Silvanidae in three genera. Pal (1981) recently described the larva of *Monanus concinnulus* (Walker).

The family arrangement used here is that of Crowson (1981); the assignment of genera to subfamilies in the Silvanidae follows Thomas (1984a). A conservative course is followed in maintaining the Laemophloeinae as a subfamily of the Cucujidae, although there is evidence for considering it of full family rank allied to the Phalacridae and Propalticidae (Thomas 1984b).

In preparing this key to larvae, I have examined representatives of species belonging to the following

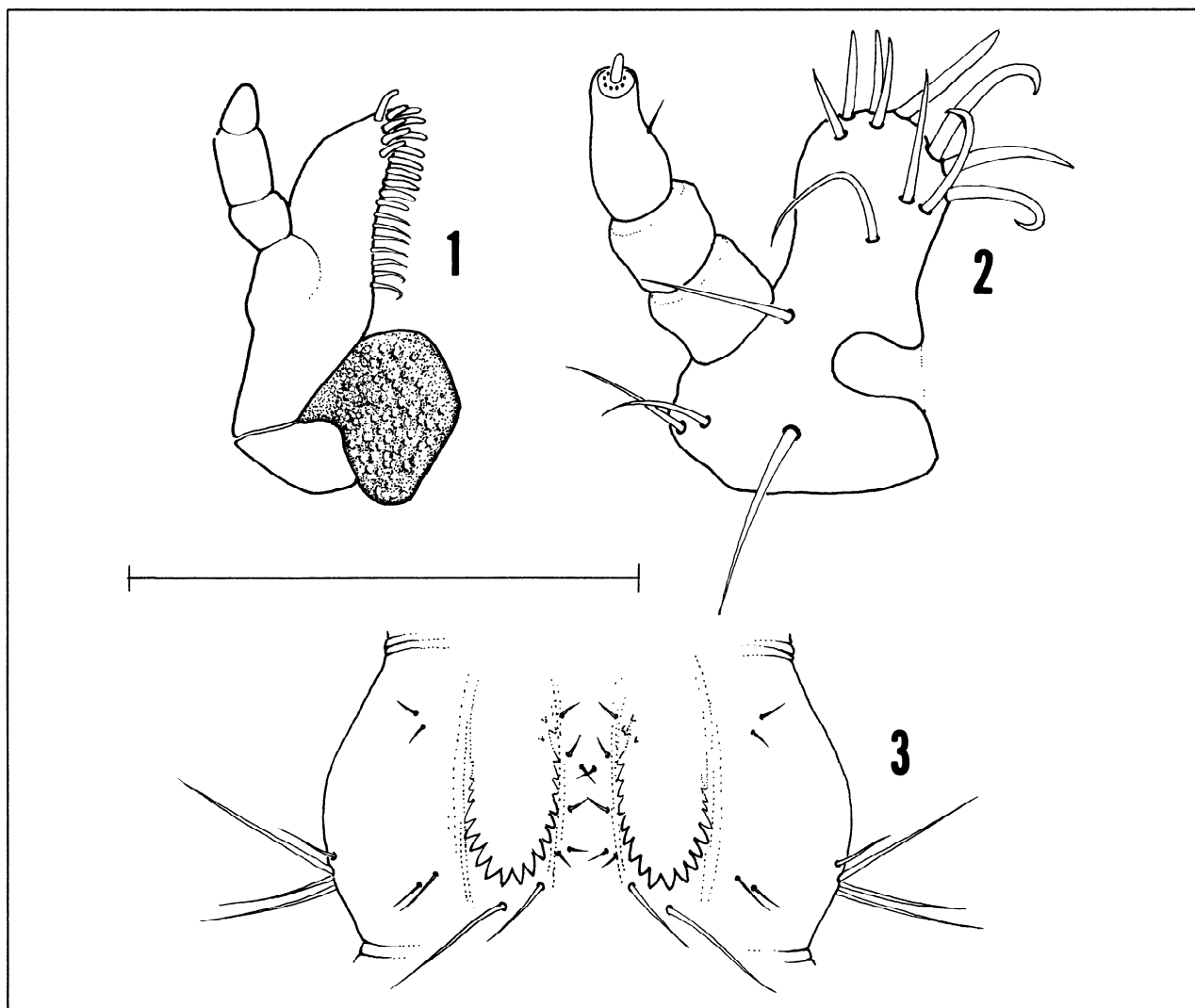
genera: (Silvanidae: Uleiotinae) *Telephanus* (1 sp.), *Uleiota* (1 sp.), *Cryptamorpha* (1 sp.), *Dendrophagus* (2 sp.); (Silvaninae) *Ahasverus* (2 spp.), *Cathartus* (1 sp.), *Oryzaeophilus* (2 spp.), *Silvanus* (2 spp.), and *Cathartosilvanus* (1 sp.); (Passandridae) *Catogenus* (1 sp.), *Scalidia* (1 sp.); (Cucujidae: Cucujinae) *Cucujus* (1 sp.), *Pediacus* (1 sp.); (Laemophloeinae) *Laemophloeus* (*sens. str.*) (3 spp.), *Placonotus* (1 sp.), *Cryptolestes* (3 spp.), *Dysmerus* (1 sp.), *Narthecius* (1 sp.), and *Lathropus* (1 sp.), plus that of *Laemophloeus* (*sens. lat.*) *chamaeropsis* (Schwarz), which seems most closely allied to *Phloeolaemus* Casey. North American genera for which larvae are still unknown are: (Laemophloeinae) *Rhinomalus*, *Charaphloeus*, *Leptophloeus*, *Parandrita*, *Rhabdophloeus*, *Deinophloeus*; (Silvanidae) *Pensus* and *Silvanoprus*. The larvae of *Cathartosilvanus*, *Laemophloeus*, *Placonotus*, and *Phloeolaemus* were reared to adults and also have been taken numerous times in association with adults. The larvae of two of the species of *Cryptolestes*, *Cathartus*, and *Oryzaeophilus*, and one of the species of *Ahasverus* were taken from cultures. The larvae of the remainder of the species were identified by association with adults or through the literature. Couplet 19 was modified from an unpublished key to the larval mandibles of several stored products silvanids by D.J. Vail, Jr. Figure 15 was redrawn from Saalas (1917). Specimens examined are in the collections of the Florida State Collection of Arthropods, the U.S. National Museum of Natural History, California Academy of Sciences, D.H. Habeck, and the author.

Success in using this key depends on examination with a transmitted light microscope of cleared, slide-

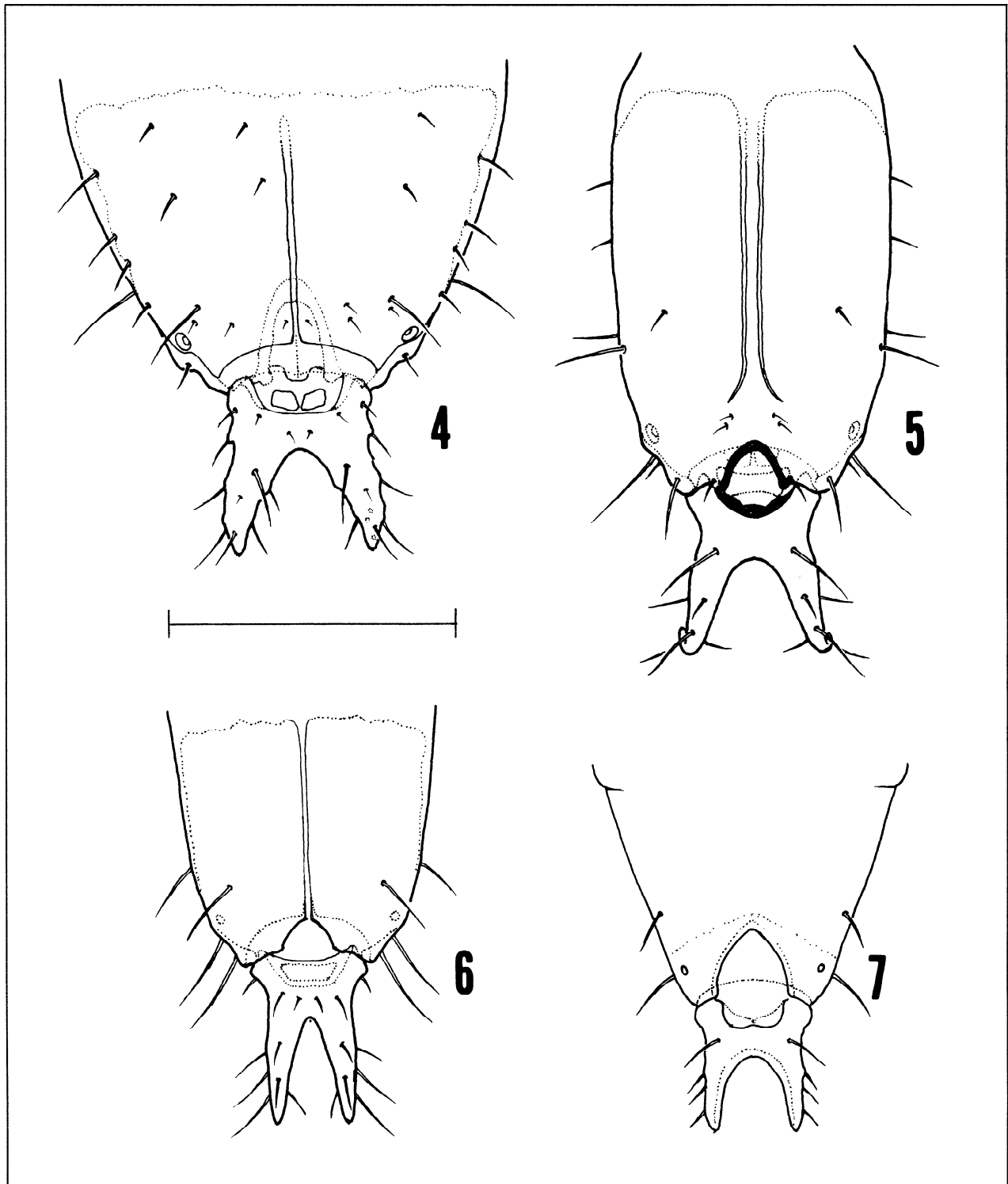
mounted specimens. A number of new characters used in the key have been discovered and are best observed in this way. However, the pigmented spots that are associated with the ocelli are destroyed during clearing and should be examined and sketched beforehand.

1. Body physogastric; mouthparts, antennae, and legs reduced; ectoparasitoids on xylophagous Coleoptera (Passandridae) .....  
... *Catogenus* Westwood and *Scalidia* Erichson
- 1'. Body not physogastric; mouth parts, antennae, and legs normal; known habits not parasitoid .....
- 2(1'). Maxillary mala falciform; maxillary articulating area not reduced; cardines present (Fig. 1); abdominal segment VIII subequal to, or shorter than, segment VII .....
- 2'. Maxillary mala obtuse; maxillary articulating area reduced; cardines absent (Fig. 2); abdominal segment VIII noticeably longer than segment VII (*Laemophloeinae*) .....
- 3(2'). Abdominal tergites and sternites with conspicuous (in slide-mounted specimens) paired patches of asperities (Fig. 3); abdominal segment VIII sclerotized for most of length (Fig. 4-6) ..
- 3'. Abdominal tergites and sternites without conspicuous paired patches of asperities, although scattered, minute asperities can be observed under high magnification; in most species, abdominal segment VIII sclerotized only near apex (Fig. 7) (the larva of *Cryptolestes punctatus* (LeConte) has abdominal segment VIII sclerotized as in Fig. 4-6, but lacks paired patches of asperities) .....
- 4(3). Mandibles without a grinding mola (Fig. 8); distinct asperities present on abdominal segment VII .....
- 4'. Mandibles with a distinct grinding mola; asperities on abdominal segment VII visible only under high magnification .....
- 5(4'). Abdominal sternite VIII with a longitudinal sclerotized strip bordered on both sides by membranous tissue (Fig. 5); mola narrow, as in Fig. 9  
... *Laemophloeus* (*sens. lat*) *chamaeropis* Casey
- 5'. Abdominal sternite VIII with a single longitudinal membranous area (Fig. 6, 28); mola broad (Fig. 10) .....
- 6(3'). Sensory process of antennomere II more than half as long as antennomere III (Fig. 11); mandible with mola acute, without grinding surface .....
- 6'. Sensory process of antennomere II less than half as long as antennomere III, as in Fig. 12; mandible with or without grinding mola .....
- 7(6'). Mandible with acute basal tooth in place of grinding mola .....
- 7'. Mandible with grinding mola (Fig. 9) .....
- 8(2). Cardo not divided (Fig. 1); urogomphi fixed horn-like; abdominal segment X small, ventral (*Cucujinae*) .....
- 8'. Cardo divided (Fig. 13); urogomphi, if present, not horn-like; abdominal segment X forming a posterior pygopod (*Silvanidae*) .....
- 9(8). Urogomphi arising directly from tergite IX (Fig. 14), not on a sclerotized stalk .....
- 9'. Urogomphi arising from a sclerotized stalk on tergite IX (Fig. 15) .....
- 10(8'). Antenna with antennomere III subequal to II (Fig. 16); one tarsungular seta much farther distad than the other (Fig. 17) (*Uleiota*) .....
- 10'. Antenna with antennomere III reduced to a cap-like process at the apex of antennomere II (Fig. 18-19); tarsungular setae not widely separated (*Silvaninae*) .....
- 11(10). Abdominal tergite IX without urogomphi; sensory process of antenna barely enlarged at base (Fig. 20) .....
- 11'. Abdominal tergite IX with urogomphi; sensory process of antenna with bulbous base (Fig. 21) .....
- 12(11'). Urogomphi longer than abdominal segment X; posterior angles of abdominal sternite VIII produced posteriorly so that they resemble secondary urogomphi (Fig. 22) .....
- 12'. Urogomphi shorter than abdominal segment X; posterior angles of abdominal sternite VIII not produced posteriorly (Fig. 23) .....
- 13(12). Antennomere III as long as II; five ocellar pigment spots present, three anteriorly and two posteriorly .....
- 13'. Antennomere III shorter than II; six ocellar pigment spots present, four anteriorly and two posteriorly .....
- 14(10'). Ocellar pigment spots arranged in three groups of two spots each .....

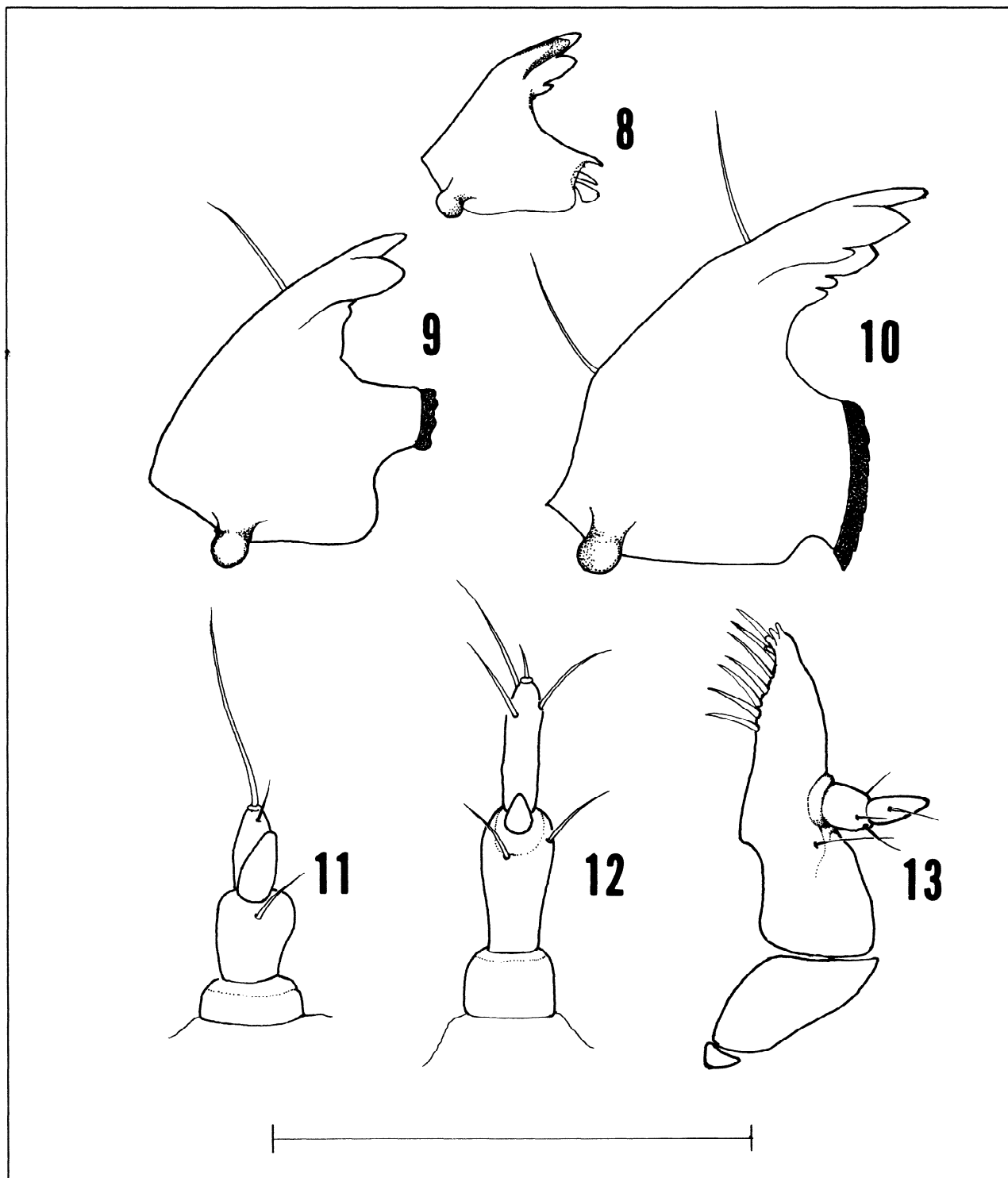
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| 14'. Ocellar pigment spots not arranged in three groups of two spots each .....15  | measured from anterior edge of labrum to base of head capsule .....18   |
| 15(14'). Abdominal tergite IX with two tubercles (Fig. 24) .....16   | 17'. Antennae shorter than length of head .....19   |
| 15'. Abdominal tergite IX without tubercles ....17   | 18(17). Antennomere III more or less dome-shaped (Fig. 19) ..... <i>Cathartosilvanus</i> Grouvelle                              |
| 16(15). Tergal shields heavily sclerotized; ocellar pigment spots arranged in two distinct groups, as in Fig. 25 ..... <i>Nausibius</i> Redtenbacher | 18'. Antennomere III produced, nearly parallel-sided (Fig. 27) ..... <i>Silvanus</i> Latreille                                  |
| 16'. Tergal shields lightly sclerotized; ocellar pigment spots not arranged in two distinct groups (Fig. 26) ..... <i>Oryzaephilus</i> Ganglbauer    | 19(17'). Abdominal tergal shields distinctly pigmented; subapical tooth on mandibles not prominent ..... <i>Ahasverus</i> Gozis |
| 17(15'). Antenna distinctly longer than length of head   | 19'. Thoracic tergal shields obsolescent; subapical tooth on mandibles prominent ..... <i>Cathartus</i> Reiche                  |



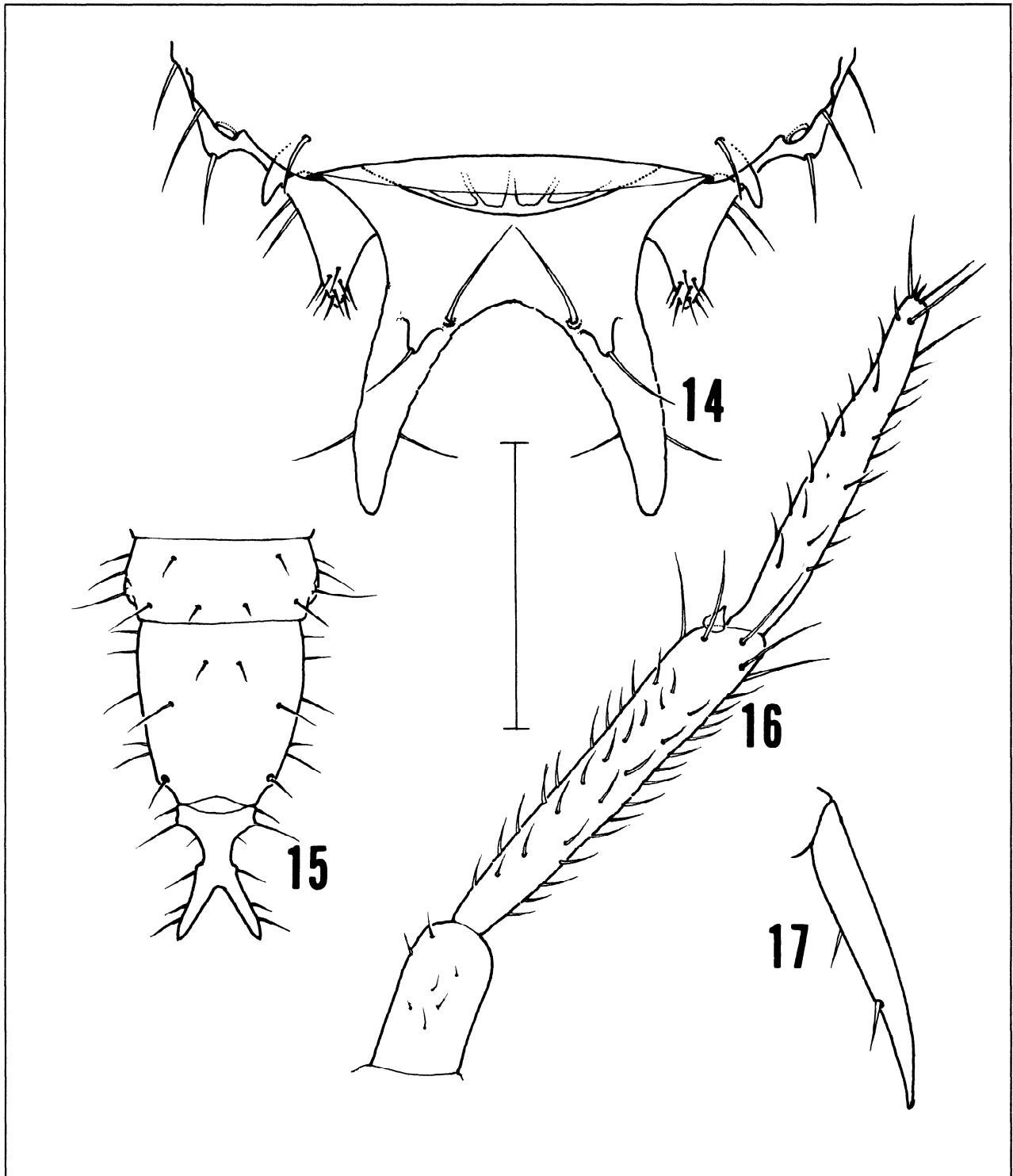
**Figures 1-3.** 1) *Cucujus clavipes* Fabricius, maxilla; 2) *Laemophloeus biguttatus* (Say), maxilla; 3) *Placonotus modestus* (Say), abdominal segment IV, ventral view. Line = 0.5mm for Fig. 1 and 3, 0.125mm for Fig. 2.



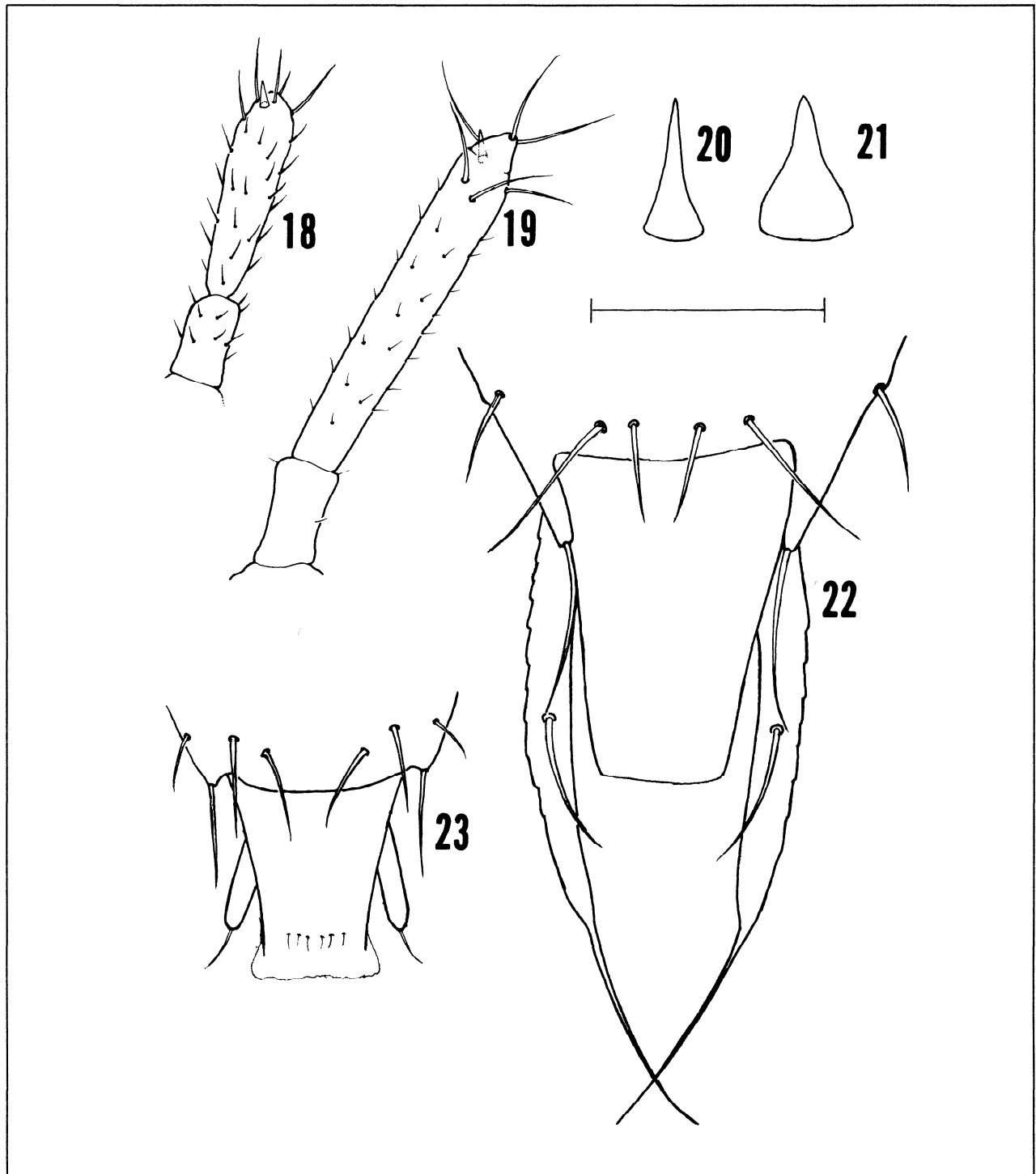
**Figures 4-7.** 4) *Laemophloeus biguttatus* (Say), apex of abdomen, ventral view; 5) *Laemophloeus* (*sens. lat.*) *chamaeropsis* Schwarz, same; 6) *Placonotus modestus* (Say), same; 7) *Cryptolestes ferrugineus* (Stephens), same. Line = 0.5mm.



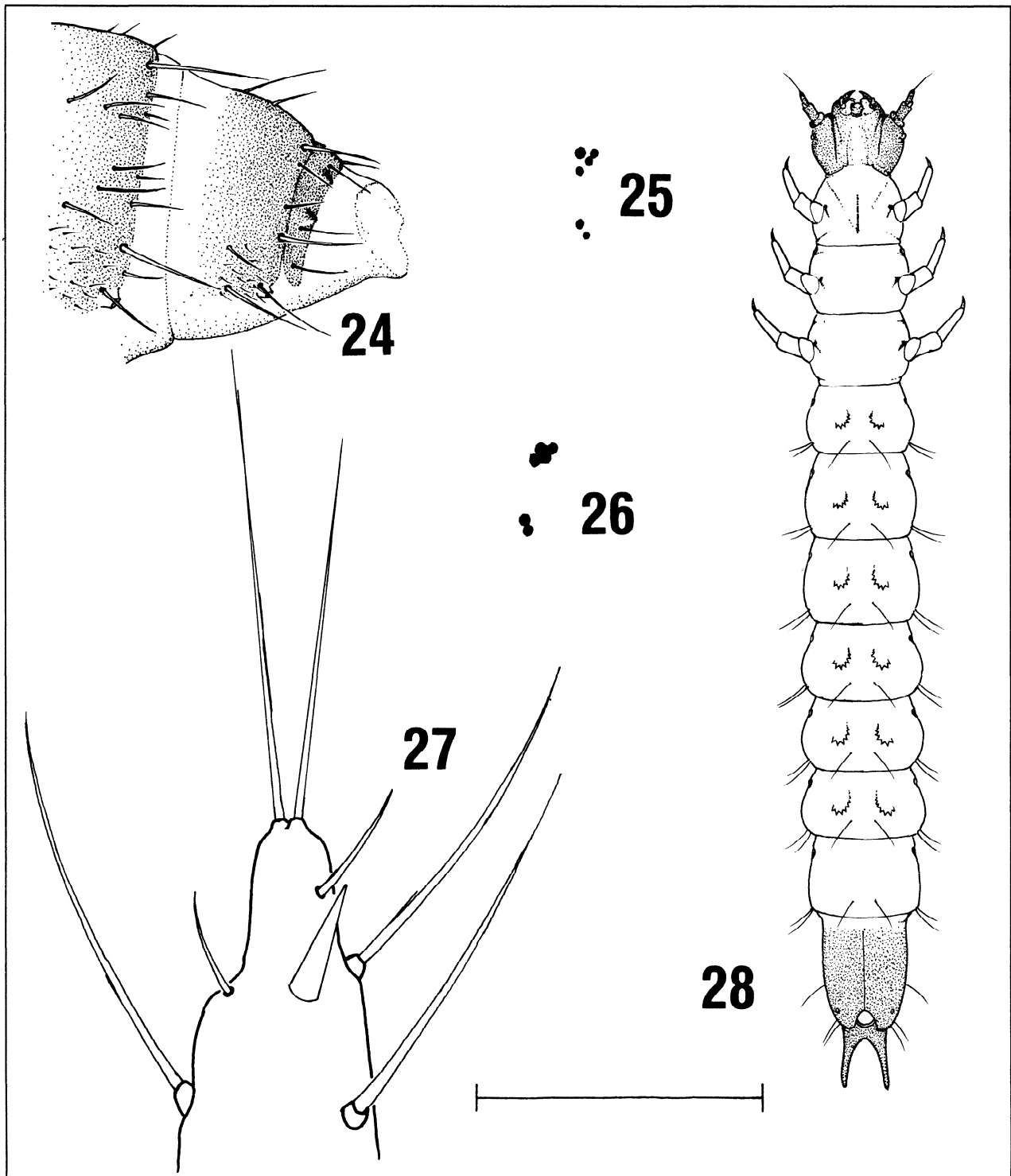
**Figures 8-13.** 8) *Laemophloeus biguttatus* (Say), mandible; 9) *Cryptolestes pusillus* (Schonherr), same; 10) *Placonotus modestus* (Say), same; 11) *Lathropus pictus* Schwarz, antenna; 12) *Placonotus modestus* (Say), same; 13) *Telephanus velox* (Haldeman), maxilla. Line = 0.5mm for Fig. 8, 0.125mm for Fig. 9-11, 0.25mm for Fig. 12, 0.875mm for Fig. 13.



**Figures 14-17.** 14) *Cucujus clavipes* Fabricius, abdominal apex, dorsal view; 15) *Pediacus fuscus* Erichson, same (redrawn from Saalas 1917); 16) *Uleiota dubia* (Fabricius), antenna; 17) *Telephanus velox* (Haldeman), tarsungulus. Line = 1.2mm for Fig. 14, 0.5mm for Fig. 16, 0.167mm for Fig. 17.



**Figures 18-23.** 18) *Oryzaephilus surinamensis* (Linnaeus), antenna; 19) *Cathartosilvanus imbellis* (LeConte), antenna; 20) *Telophanus velox* (Haldeman), sensory process of antennomere III; 21) *Uleiota dubia* (Fabricius), same; 22) *Uleiota dubia* (Fabricius), abdominal apex, ventral view; 23) *Cryptamorpha desjardinsi* (Guerin), same. Line = 0.167mm for Fig. 18-19, 0.07mm for Fig. 20-21, 0.5mm for Fig. 22-23.



**Figures 24-28.** 24) *Oryzaephilus surinamensis* (Linnaeus), abdominal apex, oblique view; 25) *Carthartosilvanus imbellis* (LeConte), ocellar pigment spots; 26) *Oryzaephilus mercator* (Fauvel), same; 27) *Silvanus planatus* Germar, antennal apex; 28) *Placonotus modestus* (Say), larva, ventral view, length 4.0mm. Line = 0.5mm for Fig. 24, 0.07mm for Fig. 27, 0.67mm for Fig. 25-26.



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