

Larvae of the Weevil Family Attelabidae of Japan : Part 2. Subfamily Rhynchitinae (Insecta : Coleoptera)

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Larvae of the Weevil Family Attelabidae of Japan
Part 2. Subfamily Rhynchitinae
(Insecta: Coleoptera) *

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Second part of the larval study on the Attelabidae deals with the subfamily Rhynchitinae on nine genera and ten species. Genera treated are *Auletobius*, *Deporaus*, *Aspidobyctiscus*, *Byctiscus*, *Neocoenorrhinus*, *Rhynchites*, and *Mechoris*.

Subfamily Rhynchitinae

Auletini plus Rhynchitini : Emden, 1938, Trans. Roy. Ent. Soc. London, 87 : 9.

Larvae of this subfamily are easily distinguished from those of the Attelabinae by the characters noted in the key. The prodorsum and postdorsum of this subfamily are not fully homologous with those of Attelabidae as already noted by the authors (1987). The maxillary mala is divided into two lobes, the apical lobe is referable to the galea and the basal lobe is to lacinia, but the suture between the stipes and lacinia is completely disappeared. In case when the mala is clearly divided, the setae on each lobe are termed as the setae of galea-lobe or those of lacinia-lobe. The tooth-like projection at the median part of mala belongs to the lacinia, but often obsolete in some genera of the Rhynchitinae.

Auletobius uniformis (Roelofs)

(Fig. 1)

Body strongly curved, stout, with fine setae, some of them long, with moderately distinct asperities.

Head retracted, short, produced posteriorly. Antenna with two distinct segments, basal segment cylindrical, brownish, broader than long, with four minute sensilla and an elongate conical apical segment. Catapophyses in same plane as frons. Hypopharyngeal bracon narrow. Frontal sutures indistinct. Endocarina distinct, approximately half as long as frons. Frons with five pairs of setae, setae 1, 2 and 3 short, subequal, 4 and 5 long, subequal. Dorsal epicranial setae 1, 3 and 5 long, subequal, 2 moderately long, 4 short. Lateral epicranial seta 1 moderately long, 2 long. Ventral epicranial setae short to moderately long, subequal. Four minute posterior epicranial setae present. Clypeus with two moderately long setae, subequal. Anterior margin of

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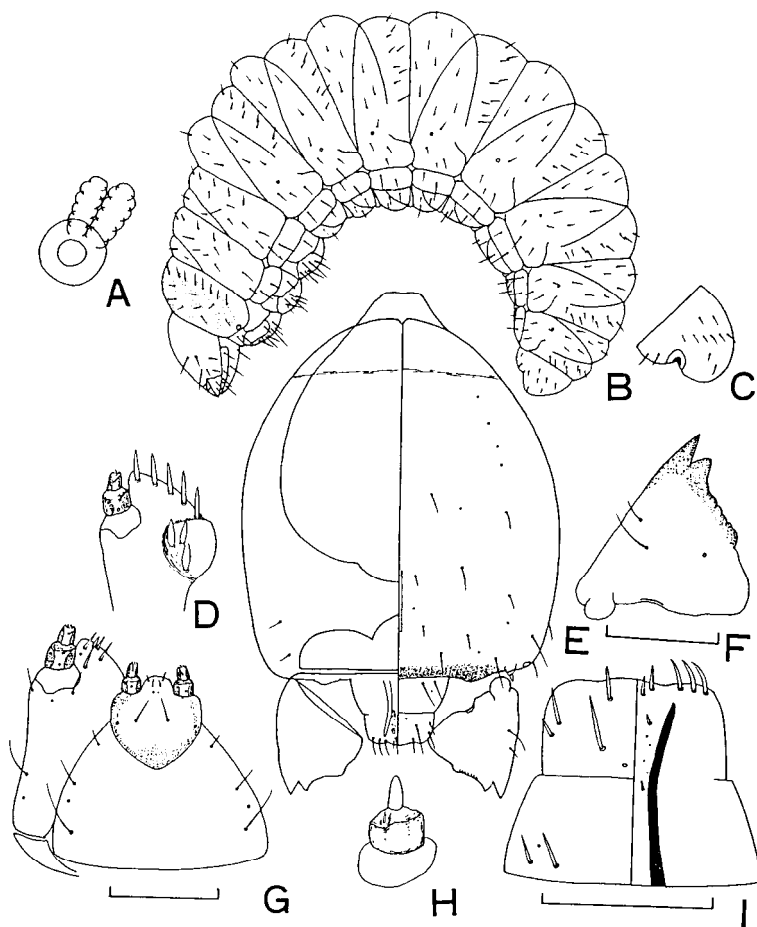


Fig. 1. *Auletobius uniformis* (Roelofs).

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

labrum weakly trilobed, the posterior margin nearly straight. Labrum with four pairs of setae, one pair near the middle very long, one pair very near the anterior margin of median lobe in position, with one pair of basal sensilla. Labral rods moderately slender and long, extended back beyond epistoma. Epipharynx with three anterolateral setae, four anteromedian setae and four median spines. Epipharyngeal sensory pores in two clusters. Mandible short and wide, apical tooth sharp, subapical tooth blunt, mandibular setae 1 slightly longer than and directly behind 2. Labial palpus with two segments, apical segment with one short seta. Ligula rounded anteriorly. Postmentum with three pairs of setae in straight lines. Maxillary palpus with two segments, apical segment with one short seta. Maxillary mala with five ventral and eight dorsal setae, of which five on galea-lobe and three on lacinia-lobe.

Pronotum with transverse smooth plate. Thoracic spiracle bicameral.

Abdomen with eight pairs of spiracles, spiracles all bicameral, marginal air-tubes longer than peritreme. Typical abdominal segments with two dorsal folds, postdorsum subdivided laterally into median and posterior folds. First transverse fold of abdominal segments 1-4 much more convex than posterior fold. Postdorsum with many setae. Anus subventral, transversely cleft.

Width of head 0.45 mm.

Materials examined: Tatsudayama, Kumamoto City., 5. vi. 1975, bred from a flower-bud of rose

The tribe Auletini are probably characterized by two-segmented maxillary palpi, and *Auletobius* is separable from *Dicranognathus*, the only known genus of the larva in this tribe up to the present, by the antenna, of which the basal segment is shorter than broad.

Neocoenorrhinus interruptus (Voss)

(Fig. 2)

Body moderately short, strongly curved, setae fine.

Head retracted, anteriorly brownish, with posterior narrower extension. Antenna with two distinct segments, basal segment cylindrical, brownish, short, with four minute sensilla and an elongate conical apical segment. Catapophyses in same plane as frons. Hypopharyngeal bracon present. Frontal sutures indistinct. Endocarina distinct, approximately half as long as frons. Frons with four pairs of setae, three anterior setae long, subequal. Dorsal epicranial setae four paired. Lateral epicranial seta 1 moderately long, 2 long. Ventral epicranial setae four and short. Four minute posterior epicranial setae present. Clypeus with two moderately long setae, subequal. Anterior margin of labrum weakly trilobed, the posterior margin weakly produced posteriorly. Labrum with four pairs of setae, one pair near the middle very long, one pair very near anterior margin of median lobe, posterior pair near side margins short, with a pair of basal sensilla. Labral rods moderately slender and long, extended back beyond epistoma. Epipharynx with three anterolateral setae, four anteromedian setae, four median spines, and six sensory pores. Mandible short and wide, with two apical teeth. Mandibular seta 1 short, slightly longer than and directly behind 2. Labial palpus with two segments, ligula rounded. Prementum with a pair of setae. Postmentum with three pairs of setae.

Maxillary palpus with three segments, apical and basal segments each with one sensillum, middle segment with one sensillum and one short seta. Maxillary mala slightly expanded apically on the inner side, with thorn-like lacinia near middle of inner margin, with five ventral and three dorsal setae on galea-lobe and, and four setae on lacinia-lobe.

Pronotum with 10 setae. Thoracic spiracle bicameral. Prodorsum of meso- and metathoraces with one short seta. Postdorsum of meso- and metathoraces with four setae, setae 1 and 2 short, subequal, 3 and 4 moderately long, subequal. Alar area with one short seta. Spiracular area with two short setae. Epipleurum with one seta. Pleurum of prothorax with two setae, of meso- and metathoraces with one seta. Pedal area with seven setae, one moderately long, the remainder shorter. Sternal setae

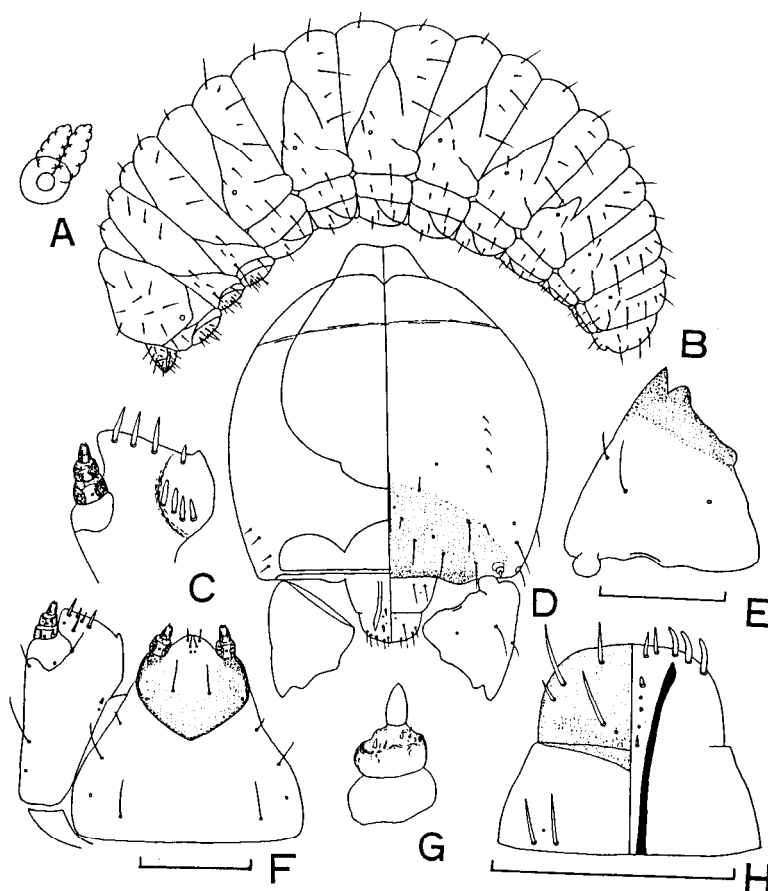


Fig. 2. *Neocoenorrhinus interruptus* (Voss).

A. Spiracle. B. Mature larva. C. Maxilla, dorsal. D. Head. E. Mandible. F. Maxilla and labium. G. Antenna. H. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

subequal to eusternal setae.

Abdomen with eight pairs of spiracles, all bicameral, air-tubes subequal in length to diameter of subcircular peritreme. Typical abdominal segments with two dorsal folds. Prodorsum with one short seta. Postdorsum with five setae, 1, 3 and 5 long, subequal, 2 and 4 short, subequal. Spiracular area with two setae, seta 1 very short, seta 2 short. Epipleurum with two setae, one short, the other slightly longer. Pleurum with two setae, one short, the other slightly longer. Pedal area with one short seta. Eusternum with two very short setae. Anus terminal, with four lobes.

Width of head 0.45 mm, length about 0.5 mm.

Materials examined : Hirosaki City, Aomori Pref., 23. vi. 1984, in young shoot of apple tree.

***Rhynchites heros* Roelofs**

(Fig. 3)

Body strongly curved, with fine setae, some of them long, and with very distinct asperities.

Head retracted, anteriorly brownish above and laterally. Antenna with two distinct segments, the basal segment cylindrical, brownish, a little shorter than broad, with four minute sensilla and a short conical apical segment. Catapophyses in same plane as frons. Hypopharyngeal bracon present. Frontal sutures indistinct. Endocarina distinct, approximately half as long as frons. Frons with five pairs of setae, setae 1, 2 and 3 short, subequal, 4 and 5 long, subequal. Dorsal epicranial setae 1, 3 and 5 long, subequal, 2 moderately long, 4 short. Lateral epicranial seta 1 moderately long,

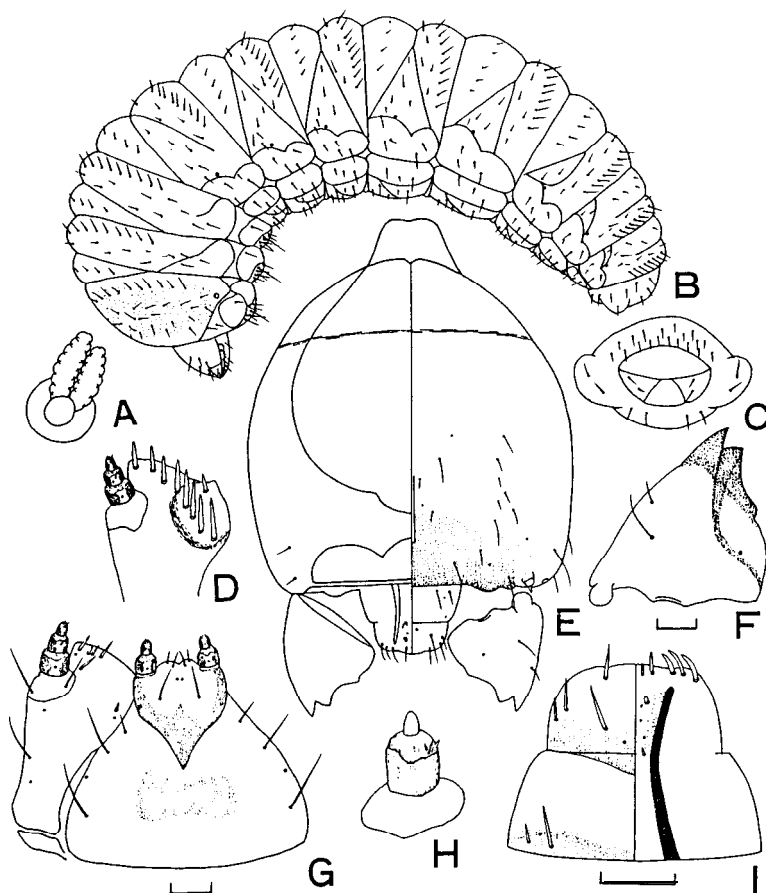


Fig. 3. *Rhynchites heros* Roelofs.

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

2 long. Ventral epicranial setae short to moderately long, subequal. Four minute posterior epicranial setae present. Clypeus with two moderately long setae, subequal. Anterior margin of labrum trilobed, the posterior margin weakly produced posteriorly, with four pairs of setae, one pair near the middle very long, one pair very near the apical margin of the median lobe, with one pair of basal sensilla. Labral rods moderately slender and long, extended back beyond epistoma. Epipharynx with three anterolateral setae, four anteromedian setae and four median spines. Epipharyngeal sensory pores in two clusters. Mandible with two sharp apical teeth and small subbasal tooth, mandibular seta 1 short, slightly longer than and directly behind 2. Ligula bilobed. Labial palpus with two segments, apical segment with one short seta. Postmentum with three pairs of setae in straight lines, seta 1 and 2 long, subequal. Sclerotisation of postmentum smaller, not wider than prementum. Maxillary palpus with three segments, basal segment with one sensillum, apical and median segments with one short seta and one sensillum. Maxillary mala with five ventral and eight dorsal setae, of which four on lacinia-lobe and spinous.

Pronotum with transverse smooth plate. Spiracles bicameral, marginal air-tubes longer than peritreme.

Abdomen with eight pairs of spiracles, spiracles all bicameral. Typical abdominal segments with two dorsal folds. Postdorsum of abdomen with many setae. Anus terminal, surrounded by four lobes, transversely X-shaped.

Width of head 1.2 mm.

Materials examined : Kurokami, Kumamoto City, 14. vi. 1972, bred from a fruit of peach.

This species agrees well with the description of *Rhynchites s.* str. by Emden, 1938, in having the following characters : postdorsum with 8 setae in a line, maxillary tooth absent, ligula feebly bilobed, and front angles of head slightly prominent. The materials dissected are probably the penultimate instar.

***Mechoris ursulus* (Roelofs)**

(Fig. 4)

Body strongly curved, stout, with fine setae and distinct asperities.

Head retracted, anteriorly brownish above and laterally, longer than wide, parallel-sided on anterior 2/3. Antenna with two segment, the basal segment cylindrical, brownish, longer than wide, with four minute sensilla and an elongate conical apical segment. Catapophyses in same plane as frons.

Hypopharyngeal bracon present. Frontal sutures indistinct. Endocarina distinct, approximately half as long as frons. Frons with four pairs of setae and a pair of sensilla, seta 1 short. Dorsal epicranium with four pairs of setae and four pairs of sensilla. Lateral epicranium with three setae, setae 1 and 2 short, 3 long. Ventral epicranial seta 1 short, 2 long. Four minute posterior epicranial setae present. Clypeus with two long setae. Anterior margin of labrum broadly arched anteriorly, posterior margin shallowly and broadly arched posteriorly. Labrum with four pairs of setae, one pairs near the middle very long, one pair very near the anterior margin of the median lobe, with one pair of basal sensilla. Epipharynx with three anterolateral setae, four anteromedian setae, four median spines, and six sensory pores. Mandible with two

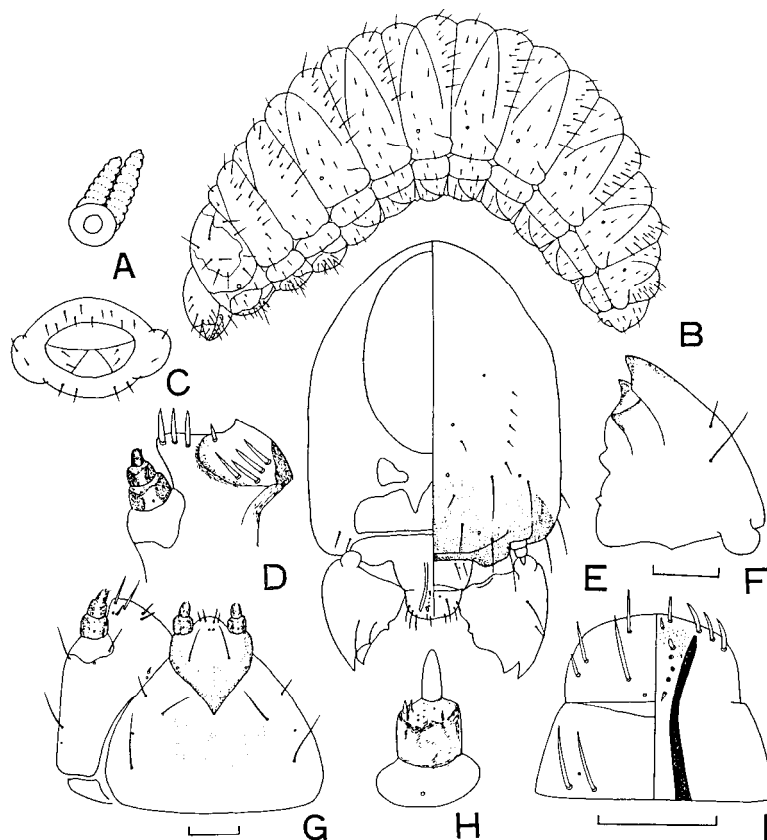


Fig. 4. *Mechoris ursulus* (Roelofs).

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

sharp apical teeth and with small subbasal tooth, median ridge of inner surface with a tooth, outer surface of mandible with two setigerous hollows. Mandibular seta 1 short, slightly longer than and directly behind 2. Labial palpus with two segments, apical segment with one sensillum. Ligula truncate. Prementum with a pair of long setae. Postmentum with three pairs of setae, the middle pair a little interior to anterior pair in position. Weak median sclerotisation of postmentum smaller, not wider than prementum. Maxillary palpus with three segments, basal segment with one sensillum, apical and middle segment with one short seta and one sensillum. Maxillary mala with five ventral setae, of which the basal one short and distant from tooth of the inner margin, with three dorsal setae on galea-lobe and four setae on lacinia-lobe.

Pronotum with transverse smooth plate, third paramedian pair of setae distant about one and a half times as far as first pair, posterior asperate area reaching the midway of the second and third paramedian setae. Spiracles all bicameral, lateral, marginal air-tubes longer than peritreme.

Abdomen with eight pairs of spiracles, spiracles all bicameral. Typical abdominal segments with two dorsal folds. Postdorsum of typical abdominal segment with six long and four short setae, long setae in a straight line. Anus terminal, surrounded by four lobes, transverse X-shaped.

Width of head 0.75 mm.

Material examined : Mt. Hikosan, Fukuoka Pref., 11. xi. 1958, in acorn of *Quercus serrata*.

This genus is easily separable from the others by the six epipharyngeal sensilla, arrangement of setae of the postmentum, and presence of the subbasal small tooth on the mandible.

Genus *Byctiscus* Thomson
(Figs. 5-8)

Emden, 1938, Trans. Roy. Ent. Soc. London, 87 : 12

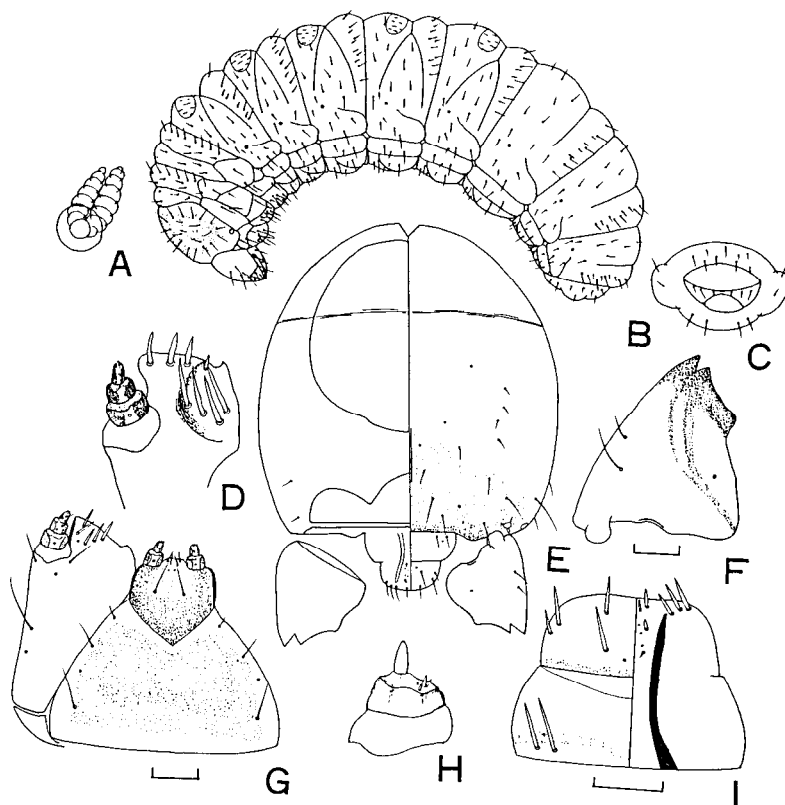


Fig. 5. *Byctiscus venustus* Pascoe.

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

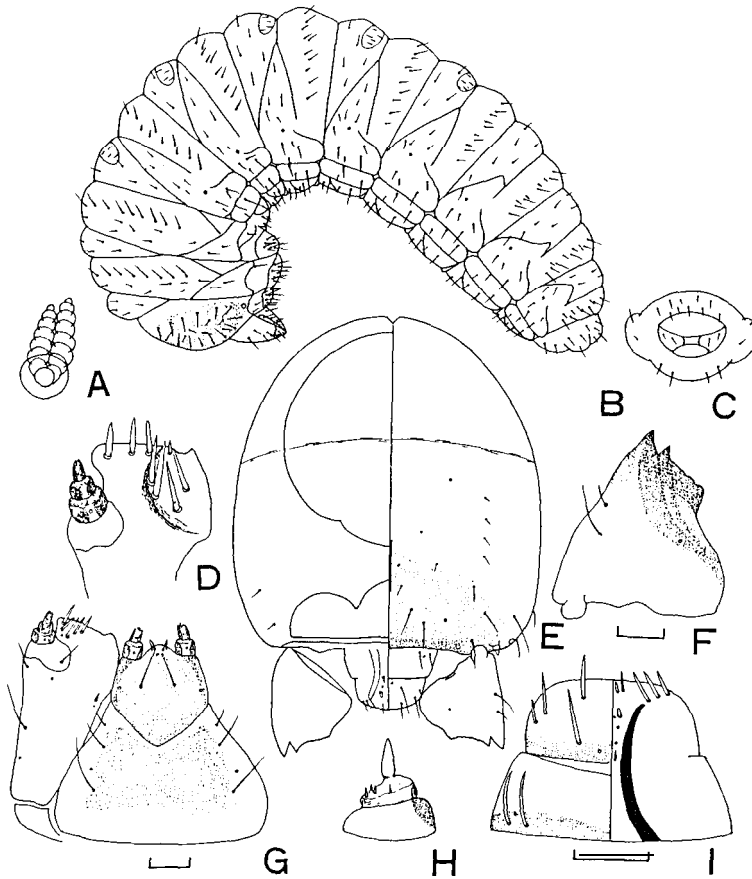


Fig. 6. *Byctiscus puberulus puberulus* (Motschulsky).

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

Body moderately stout, with fine setae and minute asperities.

Head retracted, anteriorly brownish above, about as long as wide. Antenna with two distinct segments, basal segment brownish, short, with four minute sensilla and an elongate conical apical segment. Catapophyses in same plane as frons. Hypopharyngeal bracon present. Frontal sutures indistinct. Endocarina distinct, approximately half as long as frons. Frons with five pairs of setae and two pairs of sensilla, seta 1 short. Dorsal epicranial setae three paired, two setae along pigmented margin short, with two sensilla. Lateral epicranial setae 1 moderately long, 2 long. Ventral epicranial setae short to moderately long, subequal. Four minute posterior epicranial setae present. Clypeus with two long setae, subequal. Anterior margin of labrum transverse, posterior margin weakly produced posteriorly. Labrum about 1.4 times as broad as long, with four pairs of setae, one pair near the middle very long, with one pair of basal sensilla. Labral rods moderately slender and long, extended back beyond

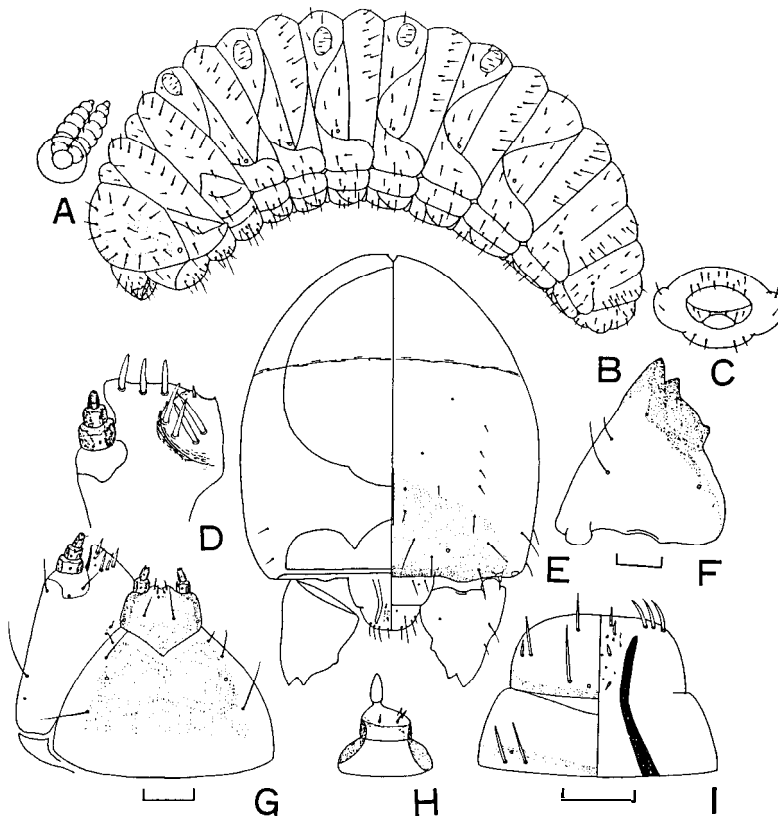


Fig. 7. *Byctiscus puberulus regalis* (Roelofs).

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

epistoma. Epipharynx with three anterolateral setae in an oblique line, four antero-median setae, four median spines and six epipharyngeal sensory pores. Mandible with two apical teeth, without subbasal tooth, mandibular seta 1 short, slightly longer than and directly behind 2. Labial palpus with two segments. Prementum with a pair of long setae. Postmentum broadly sclerotized with three pairs of setae in a straight line. Maxillary palpus with three segments, basal segment with one sensillum, apical and middle segments with one sensillum and one short seta, mala consists of two lobes, galea-lobe with five ventral and three dorsal setae, lacinia-lobe with a thorn-like tooth near middle of inner margin, with a short seta near the tooth and four setae near the dorsal margin in a group.

Pronotum with transverse smooth plate.

Abdomen with eight pairs of spiracles. Spiracles all bicameral, marginal air-tubes longer than peritreme. Typical abdominal segments with two dorsal folds, prodorsum of abdominal tergites 1-5 with a pair of flat ampullae, posterior fold with six long and four short setae. Anus terminal, surrounded by four lobes.

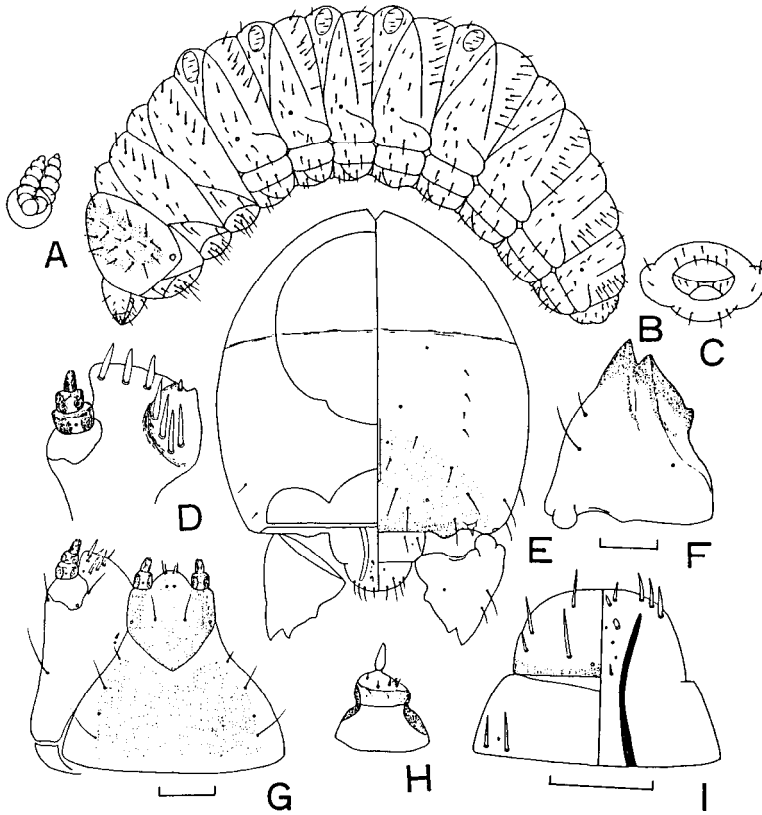


Fig. 8. *Byctiscus fausti* Sharp.

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

Species and materials examined :

Byctiscus venustus (Pascoe). Mt. Wakasugi, Fukuoka Pref., 29. vi. 1959, on *Acer* mono.

Byctiscus puberulus puberulus (Motschulsky). Sekisuiji, Kofu City., 1. vi. 1960, on *Polygonum cuspidatum*.

Byctiscus puberulus regalis (Roelofs). Mt. Wakasugi, Fukuoka Pref., 15. v. 1959, on *Acer* mono.

Byctiscus fausti Sharp. Mt. Wakasugi, Fukuoka Pref., 28. v. 1958, on *Quercus serrata*.

This genus may be characterized by the ampullae on prodorsum of the abdominal tergites 1-5 and large sclerotisation of the postmentum, broad and prominent cutting edge behind the apical tooth of the mandible, and the rounded head at the posterior margin.

Aspidobyctiscus lacunipennis (Jekel)

(Fig. 9)

Body strongly curved, stout, with fine setae and minute asperities.

Head retracted, anteriorly brownish above, as long as wide. Antenna with two distinct segments, basal segment cylindrical, brownish, short, with four minute sensilla and an elongate conical apical segment. Catapophyses in same plane as frons. Hypopharyngeal bracon present. Frontal sutures indistinct. Endocarina distinct, approximately half as long as frons. Frons with four pairs of setae and two pairs of sensilla. Dorsal epicranial setae four paired. Lateral epicranial seta 1 moderately long, 2 long. Ventral epicranial setae short, subequal. Four minute posterior epicranial setae present. Clypeus with two setae, moderately long, subequal. Anterior margin of labrum transverse, posterior margin weakly produced posteriorly, with four pairs of setae, one pair near the middle very long, one pair very near the apex of the median lobe long, with one pair of basal sensilla. Labral rods moderately slender and long, extended back beyond epistoma. Epipharynx with three anterolateral setae, four

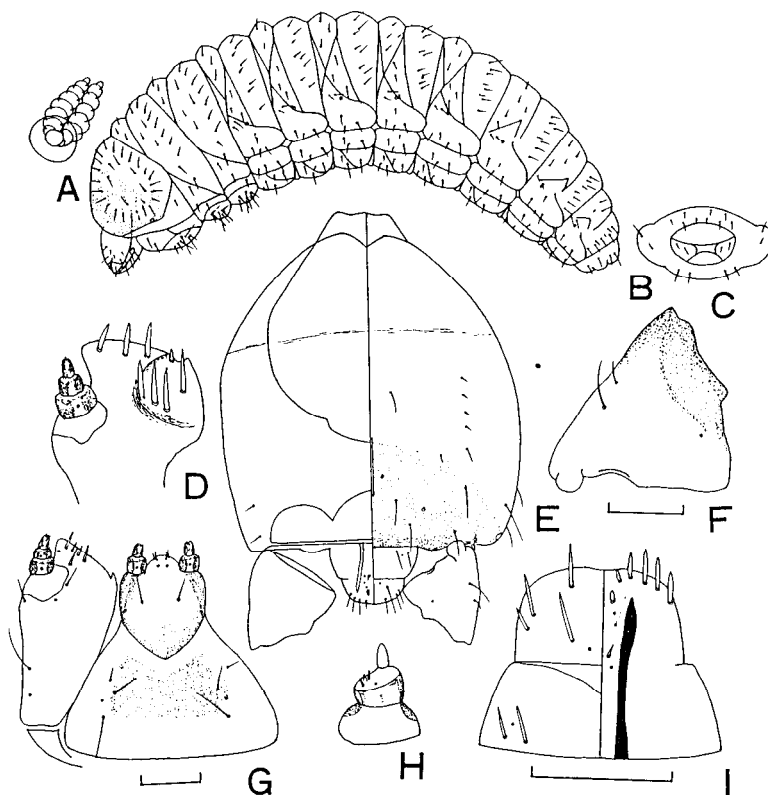


Fig. 9. *Aspidobyctiscus lacunipennis* (Jekel).

A. Spiracle. B. Mature larva. C. Anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

anteromedian setae, four median spines, and with four epipharyngeal sensory pores. Mandible with two apical teeth, without subbasal tooth, mandibular seta 1 short, slightly longer than and directly behind 2. Labial palpus with two segments. Ligula rounded anteriorly. Prementum with a pair of setae. Postmentum with three pairs of setae, the middle pair interior to the anterior pair in position, sclerotisation of postmentum a little wider than prementum. Maxillary palpus with three segments, basal segment with one sensillum, apical and middle segments with one sensillum and one short seta, mala with five ventral and three dorsal setae on galea-lobe, with four setae in a group at the dorsal margin and a small seta at the inner base of thorn-like tooth on lacinia-lobe.

Pronotum with transverse smooth plate.

Abdomen with eight pairs of spiracles. Spiracles all bicameral, marginal air-tubes longer than peritreme. Typical abdominal segments with two dorsal folds, posterior fold with six long and two to four short setae. Anus terminal, with four lobes.

Width of head 0.45 mm.

Materials examined: Satamisaki, Kagoshima Pref., 9. vi. 1958, on *Ampelopsis brevipedunculata*.

This genus is separable from *Byctiscus* by the characters noted in the key.

Genus **Deporaus** Leach

(Fig. 10-11)

Emden, 1938, Trans. Roy. Ent. Soc. London, 87 : 13. -Sawada and Lee. 1986, Kontyû, Tokyo, 54 : 672.

Body slender, weakly curved, a little flattened dorsoventrally, with fine setae and asperities.

Head deeply retracted, brownish anteriorly, elongate, about 1.5 times as long as wide, with narrow posterior extension. Antenna with two distinct segments, basal segment short, with six or seven minute sensilla, apical segment conical. Catapophyses in the same plane as frons. Hypopharyngeal bracon readily discernible. Frontal sutures indistinct. Endocarina distinct, bifurcate and reaching epistoma. Frons with four pairs of setae, seta 5 near antenna minute. Dorsal epicranial setae five paired, short. Lateral epicranial seta 1 short, 2 and 3 moderately long. Ventral epicranial setae short. Four minute posterior epicranial setae present. Clypeal seta 1 short to moderately long, nearly twice as long as 2. Anterior margin of labrum almost straight, posterior margin weakly arched posteriorly, with four pairs of setae, one pair near the middle long, one pair very near anterior margin of median lobe short, posterior seta near side margin short, with one pair of basal sensilla. Labral rods long, extended back beyond epistoma. Epipharynx with three anterolateral setae, four anteromedian setae, four median spines, and ten epipharyngeal sensory pores. Mandible as long as wide, with two apical teeth and obtuse angulations of lower cutting edge, mandibular seta 1 short, slightly longer than and directly behind 2. Labial palpus with two segments, widely distant to each other. Prementum sclerotized, brownish, transverse, each side strongly sclerotized and bent internally. Hypopharynx with an arcuate sclerite, which originate from side margins of premental sclerite and produced postero-internally to oral cavity, median part of the sclerite scarcely pigmented. Postmentum with three pairs of setae and a pair of sensory pores. Maxillary palpus

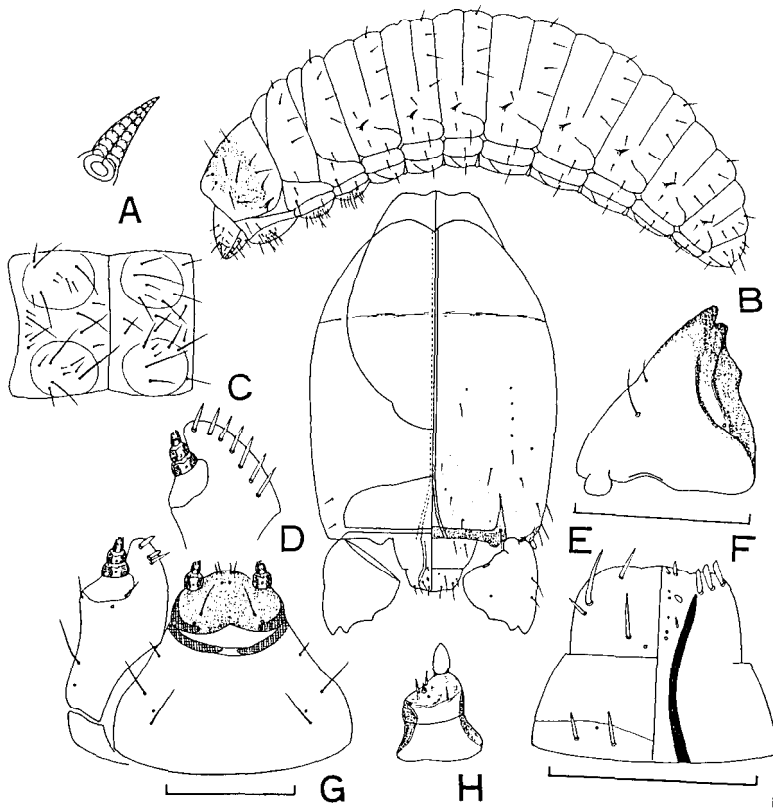


Fig. 10. *Deporaus unicolor* Roelofs.

A. Spiracle. B. Mature larva. C. Thorax, ventral. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

with three segments, basal segment without accessory process, apical segment without lateral seta. Mala with four ventral and seven dorsal setae, lacinia-lobe not defined and without tooth.

Pronotum with ten setae in general, often with one additional minute seta, dark brown. Thoracic spiracle with peritreme circular, bicameral, paired dorsal air-tubes forming a spine and well projected beyond peritreme. Prodorsum of mesothorax, metathorax and abdomen without seta, postdorsum of mesothorax, metathorax and abdomen with four setae. Alar area with one short seta. Spiracular area with one short seta. Epipleurum with one seta. Pleurum of prothorax with two setae, of meso- and metathoraces with one seta. Prosternum with a large sclerome, with four long, three short and five minute setae, of which four grouped at pedal area, meso- and metathoraces with two long setae on eusternum, seven setae on pedal area, of which one long, four moderately long and two short, and a short seta on sternellum behind pedal area.

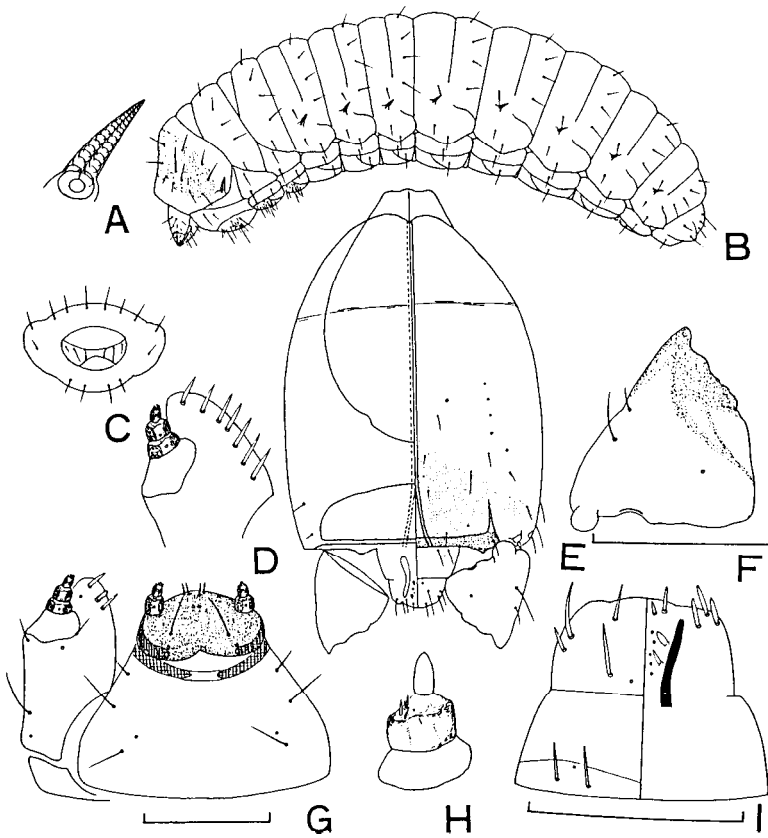


Fig. 11. *Deporaus mannerheimi* (Hemel).

A. Spiracle. B. Mature larva. C. anus. D. Maxilla, dorsal. E. Head. F. Mandible. G. Maxilla and labium. H. Antenna. I. Clypeus, labrum and epipharynx. Scale: 0.1 mm.

Abdomen with eight pairs of spiracles, each of which is similar to prothoracic one. Typical abdominal segment with two dorsal folds. Postdorsum with four setae, subequal. Spiracular area with one short seta. Epipleurum with two setae, subequal. Pleurum with one seta. Pedal area with one seta. Eusternum without seta. Anus terminal, with four lobes.

Species and materials examined :

Deporaus unicolor Roelofs. Mt. Tatsuda, Kumamoto Pref., 23. vi. 1970, on *Quercus glauca*.

Deporaus mannerheimi (Hemel). Tokyo, 11. vi. 1970, on *Castanopsis cuspidata* var. *sieboldii*.

Tribe Deporaini are characteristic in having spinous spiracles, parallel-sided head, and bifurcate endocarina.

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