

Isopterina, a New Subtribe of the Tribe Celeuthetini, with Notes on the Related Taxa (Coleoptera, Curculionidae)

Katsura MORIMOTO

c/o Entomological Laboratory, Faculty of Agriculture, Kyushu University,
Fukuoka, 812–8581 Japan

and

Hiroaki KOJIMA

The Kyushu University Museum, Kyushu University,
Fukuoka, 812–8581 Japan

Abstract Weevil genera *Arrhaphogaster*, *Borodinophilus*, *Isopterus*, *Kotoshozo*, *Neasphalmus* and *Pseudottistira* have been variously classified in the tribes Polydrusini, Celeuthetini, Pachyrhynchini or Otiorhynchini, but are newly combined together into the new subtribe Isopterina of the tribe Celeuthetini in this paper. Main features of Isopterina are the absence of the transverse sulcus at the base of rostrum, lack of the spiculum ventrale of the 8th sternite in female, and subdivided 9th sternite in male in Celeuthetini. New synonymies of genera and new combinations of species proposed in this paper are as follows: *Isopterus* FAUST, 1895 (= *Kotoshozo* KÔNO, 1942, syn. nov.), *Neasphalmus* NAKANE, 1963 (= *Borodinophilus* VOSS, 1971, syn. nov.), *Isopterus kotoensis* (KÔNO, 1942, comb. nov. from *Kotoshozo*), and *Neasphalmus ihai* VOSS, 1971, comb. nov. from *Borodinophilus*). Keys to the tribes and subtribes in question, to the genera of Isopterina and to the species of *Neasphalmus* are given. Morphological features adopted are discussed with many illustrations.

Weevil genera *Arrhaphogaster*, *Borodinophilus*, *Isopterus*, *Kotoshozo*, *Neasphalmus* and *Pseudottistira* have been variously classified in the tribes Polydrusini, Celeuthetini, Pachyrhynchini or Otiorhynchini as noted in the following check list, or some are placed in the “genera incertae sedis” (LONA, 1936, 38; ALONSO-ZARAZAGA & LYAL, 1999). These confusion must be caused by the different valuation of such features as the antennal scrobes, exposed maxillae, and shortly pedunculate postmentum, and by oversight of the mandibular scars. Thus, morphological characters are precisely examined by dissection at first, and then important ones are selected for the taxonomy of these taxa.

These genera are newly combined together into the new subtribe Isopterina in the Celeuthetini based on the three main features: absence of the transverse sulcus at the base of rostrum, lack of the spiculum ventrale on the 8th sternite in female, and subdivi-

vided 9th sternite in male.

To the late Dr. Yoshihiko KUROSAWA, this paper is dedicated in token of respect to the memory of his great contributions to the Coleopterology. He is known as the specialist of Buprestidae, but has interest in a wide range of insects including Celeuthetini and Pachyrhynchini of Curculionidae. Thus, Celeuthetini are selected for this memorial issue as an appropriate taxon to dedicate to him.

Morphological Notes on the Characters Adopted

1. Antennal scrobes

Position of the antennal scrobes have been adopted as one of the most important features for separating subfamilies in the adelognathous Curculionidae. Namely, Brachyderinae were defined by the characters that the scrobes forming sublinear furrow and curving downwards in front of the eyes, and lateral in position, whereas in Otorhynchinae they are subdorsal in position and directed towards the eyes, and the rostrum often has the pterygia expanding outwards from the antennal sockets.

The tribe Celeuthetini have been classified in the subfamily Otorhynchinae, but the antennal scrobes are dorso-lateral to lateral in position and characteristic in having generally open posteriorly, triangular or bifurcate. The pterygia are often indefinite. For example, *Platyspatus latiscapus* (Fig. 23) has the scrobes broadly open posteriorly and bare between dorsal and ventral edges; the dorsal part is shallowly furrowed from the antennal socket to the base of rostrum along dorsolateral edge, but the ventral margin is waved and running downwards in front of the eye, and the subtriangular area between them is bare and weakly convex. In *Philicoptus* spp. (Figs. 24, 25), the scrobe is apparently <-shaped and the dorsal furrow is sharp and rather short. In *Phraotes nodifer* (Fig. 26), the dorsal furrow is very short and the ventral furrow runs down obliquely in front of the eye to the ventrolateral edge like Brachyderinae auct.

Among the genera of *Isopterus* and its relatives, the antennal scrobes are more lateral in position than those of most Celeuthetini owing to having broader interscrobial area, but are similar to those of *Coptorhynchus* auct. and allies in general structures as was already noticed by GÜNTHER (1943) and VOSS (1971). The tribe Celeuthetini have been classified in the subfamily Otorhynchinae, but the antennal scrobes are regarded as the intermediate position between those of the Otorhynchinae and Brachyderinae auct. and the pterygia are often not marked.

2. Mouth-parts

The mouth-parts of the Curculionidae are generally divided into two types as in the followings (MORIMOTO & KOJIMA, 1994). 1) Phanerognathous type: Mandibles without deciduous process, often thinner, ventral cutting edge lying on or close to the exterior margin; inner surface oblique, almost flat or shallowly concave; maxillae largely or entirely exposed; mentum comparatively small or narrow in relation to the buccal cavity; postmentum pedunculate. 2) Adelognathous type: Mandibles with de-

ciduous process in general, robust, with inner surface faced to the opposite, deeply concave, so as to receive maxillary palpi and mala between them, their ventral cutting edge lying far interior to the outer contour in ventral aspect; mentum comparatively large and covering or nearly covering the buccal cavity, so as to conceal more or less completely the maxillae and their palpi; postmentum not or at most shortly pedunculate.

Among the tribes treated, the mouth-parts are of the adelognathous type in the Celeuthetini, Elytrurini and Ottistirini, whereas in the Sitonini the mandibles are partly of the phanerognathous type in having the ventral cutting edge close to exterior margin and almost flat inner surface, but has a deciduous process at the apex of the left mandible. Among the genera in the subtribe Isopterina, the postmentum is shortly pedunculate, and the maxillae are partly exposed (Fig. 7).

3. Procoxal and mesocoxal cavities

The coxae are usually termed as “connate or distant”. These cavities are, however, apparently in three character states under close examination by taking off the legs: 1) the coxae are connate externally and the coxal cavities are also connate internally, 2) the coxae are separated externally, but the coxal cavities are connate internally, 3) the coxae and coxal cavities are entirely separated both externally and internally. Among the weevils in question, the Ottistirini are the only tribe having the coxae of the type 3, whereas in the other tribes treated here, they are of the type 1 or 2.

4. Tibial apex

The terminal surface of the tibiae is often subdivided into the corbel and tarsal groove by the longitudinal carina or flange of tarsal cavity. According to the terms applied by EMDEN (1944) and followed by MORIMOTO (1962), the corbel is termed “semi-enclosed” when the tibial apex is divided into the corbel and tarsal groove and the corbel is fringed with a row of setae externally, and also termed “enclosed” when it is fringed externally with double row of setae along inner and outer margins of a crescent space. This space is also named “corbel” by EMDEN (1944), but not homologous with it (MORIMOTO, 1962). Thus, THOMPSON (1991, 1992) proposed such descriptive terms as the outer bevel for the crescent surface mentioned above, the inner flange for the semi-enclosed corbel sense EMDEN, and in case without the bevel and flange it can be described as simple. The apex of hind tibiae has outer bevel in the Elytrurini, and flange in the Celeuthetini.

5. Metendosternite

The metendosternite is fundamentally divided into two types by the presence or absence of the lateral arms in the Adelognatha (MORIMOTO, 1962). The lateral arms are present in the Sitonini and Ottistirini (Fig. 61), whereas these are absent in the Celeuthetini and Elytrurini (Figs. 10, 52, 57). The Elytrurini are characteristic in having the peculiar metendosternite, of which the metafurca is directly conglutinate to the meso-

sternite at three points, one at the middle of anterior margin, and a pair at the posterior walls of mesocoxal bowls (Fig. 57). This condition is similar to the case of *Blosyrus japonicus* (cf. MORIMOTO, 1962), but the metendosternite in the latter is conglutinate to the mesosternite only at coxal bowls.

6. Abdomen

The abdomen of the Curculionoidea is of the cryptogastran type, and the first and second sternites are absorbed into the posterior wall of coxal cavity. Thus, the first ventrite is morphologically the third sternite. Among some genera in the tribe Celeuthetini, the female abdomen has visibly only two ventrites (Fig. 12). This condition has been explained as the fusion of ventrites (MARSHALL, 1956; VOSS, 1940, 1958). It is not so, but the great expansion of the first and second ventrites results the complete covering of the following segments. By the examination under the microscope after softening treatment with KOH solution, the third to fifth ventrites are observed inside the second ventrite as less sclerotized short segments continuing from the respective tergite (Figs. 8, 20). By the same method, the concealed seventh sternite (= fifth ventrite) in the female of *Hypotactus papillatus*, which has four visible ventrites, can be observed inside the sixth sternite.

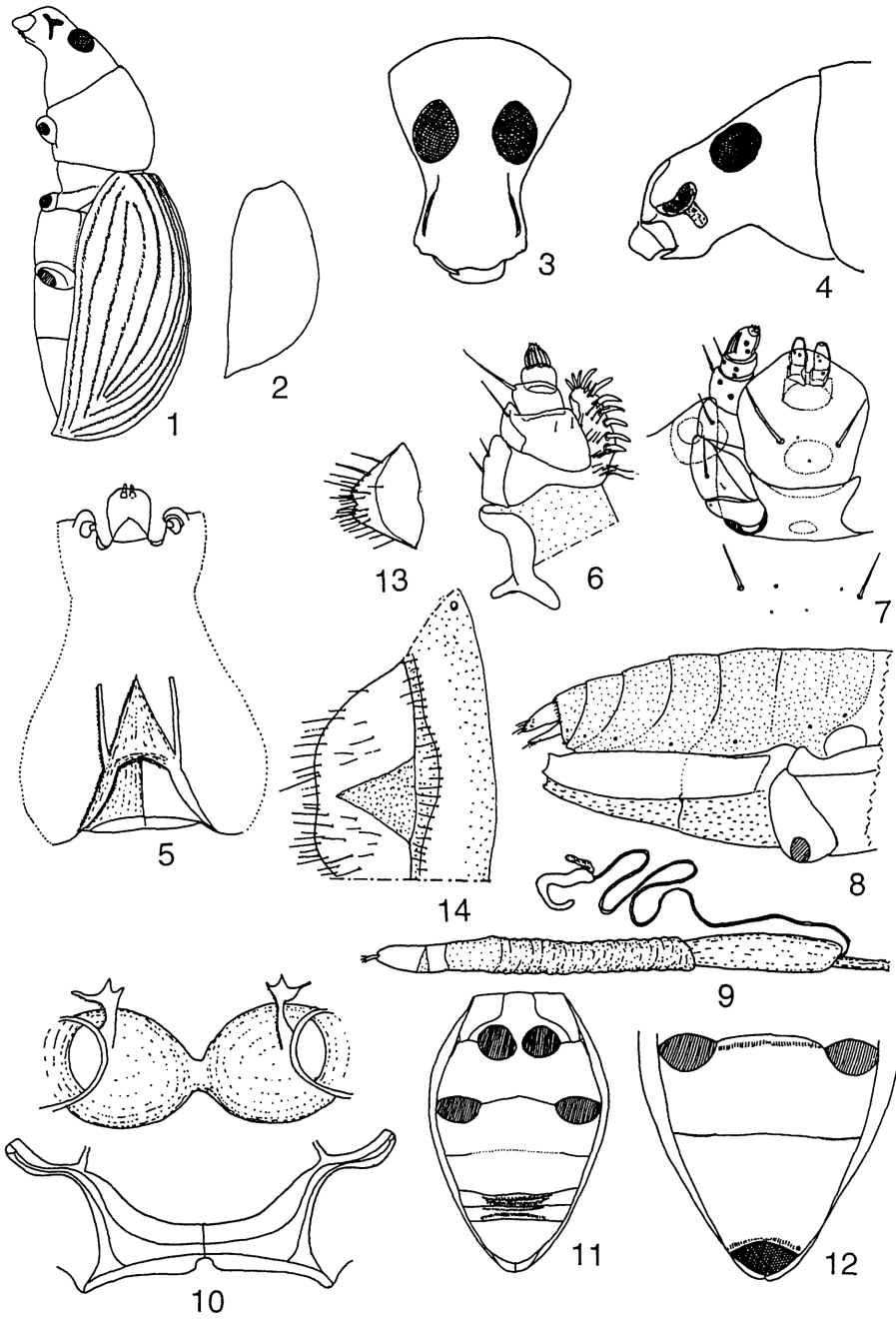
The 8th sternite in male is divided into a pair of crescent sclerites in most curculionids as well as the tribes in question, and can be taken out by dissection with 9th sternite (Figs. 42, 46). The 9th sternite in male is a small plate with or without median incision, or paired sclerites continuing to or separating from the expanded base of the spiculum gastrale. These structures may have important value for defining tribes. In the Isopterina, 9th sternite is divided into 3 sclerites (Figs. 42, 44–46). The 7th tergite is visibly terminal in most curculionids. This tergite in male has a pair of spicule patches at base, and almost completely covers the 8th tergite.

In female, the 8th sternite is the terminal, withdrawn inside the 7th, and usually furnished with the spiculum ventrale. The length of the spiculum ventrale may have relation with that of ovipositor. Isopterina are unique in having 8th sternite terminal and spiculum ventrale absent (Figs. 13, 21).

7. Ovipositor

The ovipositors of Curculionoidea were well compared from the viewpoints of both behavior and structure by HOWDEN (1995). However, these structures have not been examined for the taxonomic purpose in the related higher taxa except MORIMOTO

Figs. 1–14. — 1–12. *Neasphalmus okinawanus*; 1, female, lateral; 2, male elytra, lateral; 3, rostrum and head, dorsal; 4, rostrum and head, lateral; 5, tentorium; 6, maxilla; 7, labium and maxilla, ventral; 8, female abdomen relaxed with KOH solution, lateral, showing the relation of tergites and sternites; 9, ovipositor; 10, meso- and metasterna, dorsal, showing metendosternite and mesocoxal bowls; 11, male venter; 12, female venter. — 13–14. *Isopterus macromerus*; 13, 8th sternite, no spiculum ventrale; 14, 7th and 8th tergites.

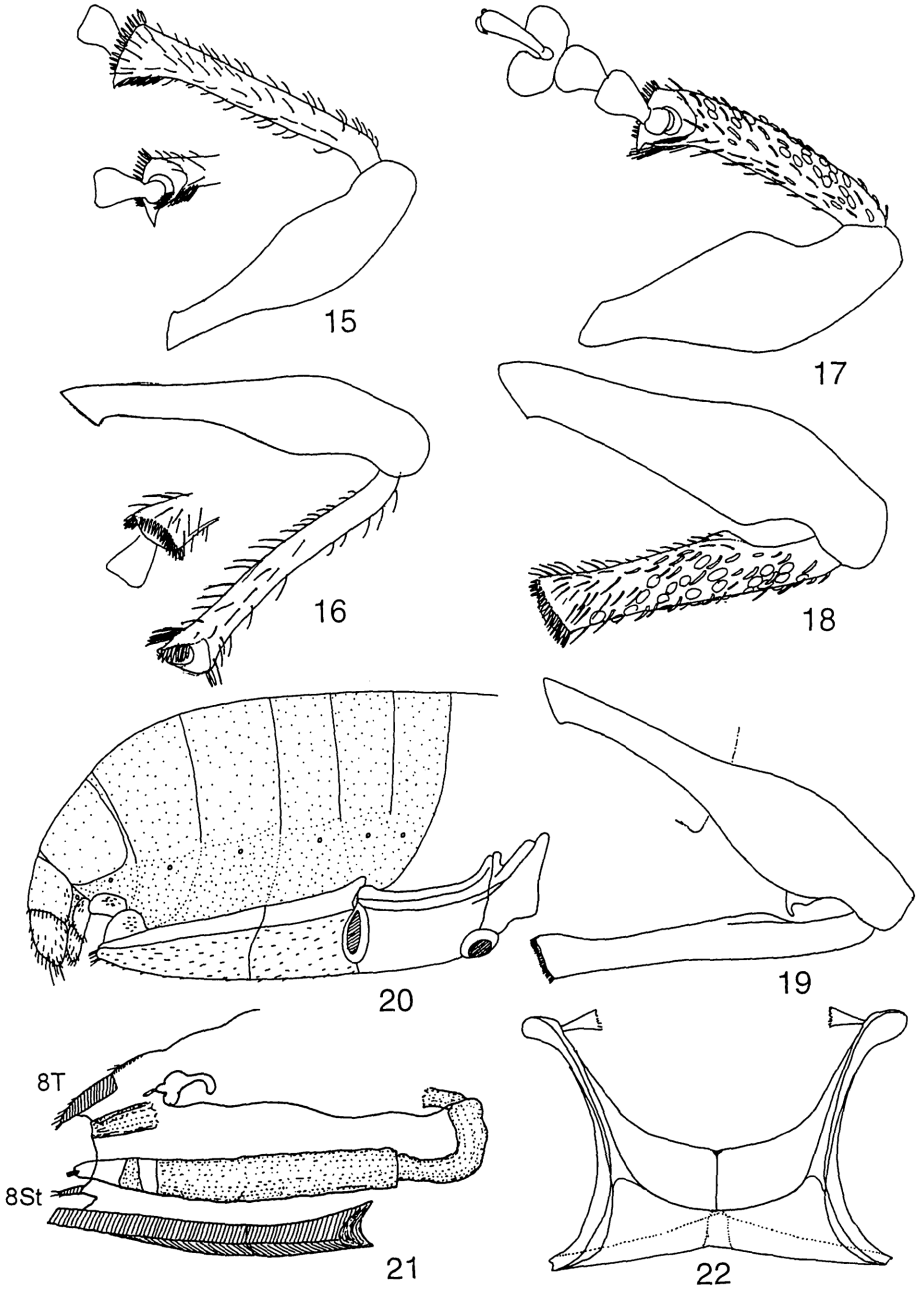


(1962), who speculated their progressive differentiation in the adelognathous Curculionidae. Distal part of coxite is prominent as a pair of processes from the proximal membranous part in the Sitonini and Ottistirini, whereas in the Elytrurini and Celeuthetini, it embraces the vagina and not prominent. The ovipositor is slender in the Celeuthetini and capable of stretching more than whole body length when ovipositing. In this case, the spermatheca is drawn into the tubular extended part.

Key to the Tribes and Subtribes in Question

- 1 (4) Metendosternite with lateral arms (Fig. 61); ovipositor very short, distal part of coxite prominent caudad from proximal membranous part (Fig. 62), bursa copulatrix well bulged (Fig. 53); 8th sternite in female with spiculum ventrale (Fig. 60).
- 2 (3) Mandibles of phaneroognathous type, with almost flat and oblique inner surface, with deciduous process at apex of left mandible, which directs internally and its scar small crescent at apex; maxillae with galea and lacinia distinct; pro- and mesocoxal cavities connate internally. . . . Tribe Sitonini
- 3 (2) Mandibles of adelognathous type, inner surface faced to the opposite, deeply concave; deciduous process indefinite; maxillae with galea and lacinia fused; pro- and mesocoxal cavities entirely separated both externally and internally. . . . Tribe Ottistirini
- 4 (1) Metendosternite without lateral arms (Figs. 10, 52); ovipositor short to long, distal part of coxite continuous with proximal part and embrace vagina between them (Figs. 9, 21).
- 5 (6) Metendosternite T-shaped, anterior part entirely flat, transverse, rounded laterally and conglutinate to mesosternite at three points, the middle of anterior margin and at the posterior wall of mesocoxal bowls, anterior arms and anterior tendons absent (Fig. 57); ovipositor short, bursa copulatrix well bulged, reaching cephalad the level of second ventrite (Fig. 53); 8th sternite in female with spiculum ventrale (Fig. 55); rostrum without transverse sulcus at base; hind tibiae with outer bevel (= corbel enclosed). . . . Tribe Elytrurini
- 6 (5) Metendosternite with anterior arms, anterior tendons widely distant, free from mesosternum (Figs. 10, 52); ovipositor slender, spermathecal duct very long (Figs. 9, 21).
- 7 (8) Metendosternite with ventral longitudinal flange strongly developed, prominent anteriorly as a narrow process from the middle of anterior margin in

Figs. 15–22. — 15–19. Legs; 15, 16, *Neasphalmus okinawanus* (15: fore leg, 16: hind leg); 17, 18, *Isopterus kotoensis* (17: fore leg, 18: hind leg.); 19, hind leg of *Isopterus macromerus*, showing slender femur and characteristic tooth. — 20, 21. *Arrhaphogaster pilosus*, female; 20, abdomen relaxed with KOH solution; 21, ovipositor in abdomen, semidiagrammatical. — 22. Metendosternite of *Isopterus macromerus*.



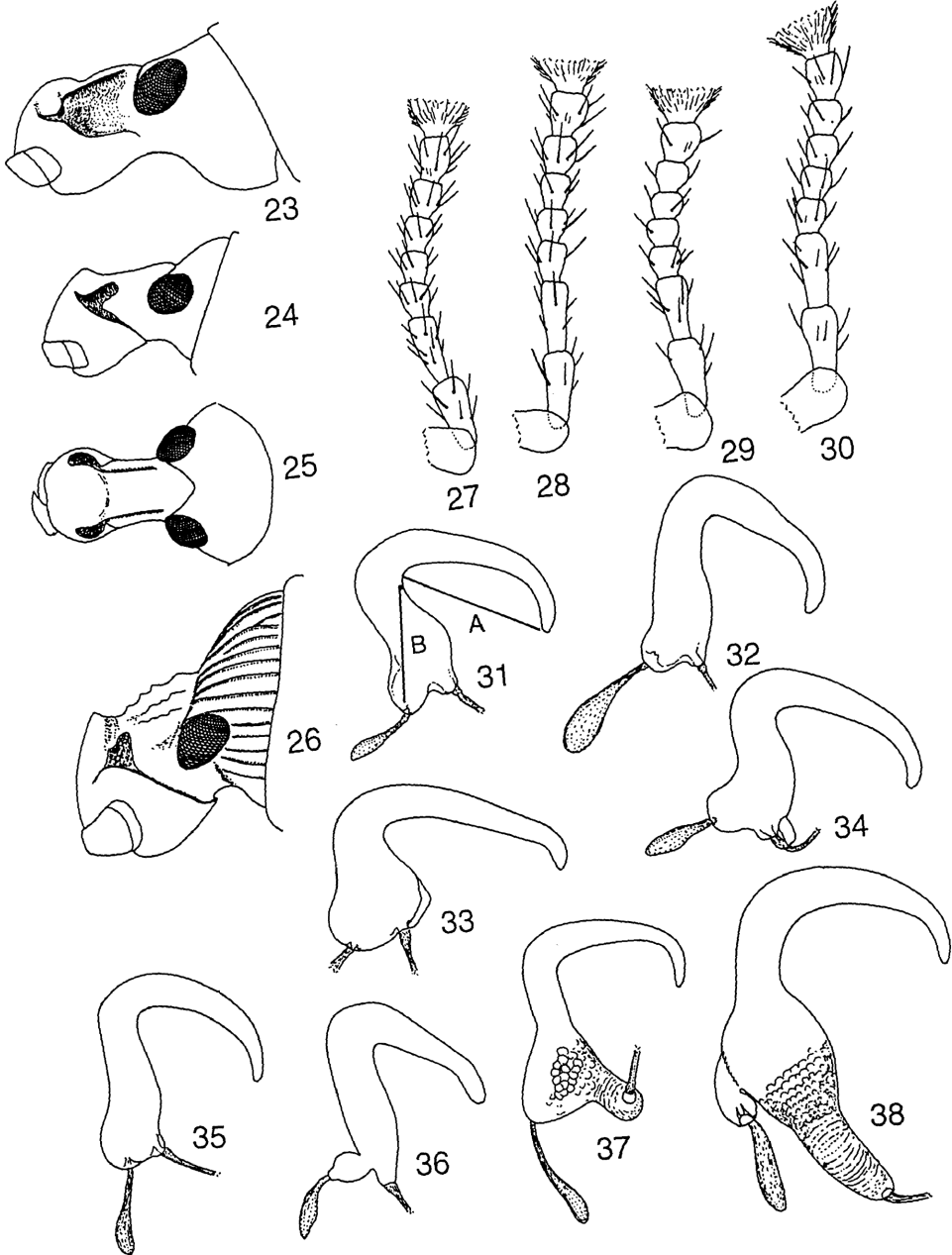
- dorsal aspect, anterior arms reaching mesocoxal bowls; ovipositor with distal part sclerotized, proximal part membranous with sclerotized stripe at side, bursa copulatrix short; venter in female with 7th tergite terminal, wholly covering 8th, 8th sternite concealed inside the 7th, with slender spiculum ventrale; mandibles without deciduous process, other structure of typical adelognathous type. Tribe Pachyrhynchini
- 8 (7) Metendosternite with anterior margin straight or shallowly concave; ovipositor very long, reaching basally to mesosternum, distal part divided into two sclerotized part, proximal part membranous, long and bellows-like (Fig. 9); bursa copulatrix indiscernible; mandibles with deciduous process, of typical adelognathous type. Tribe Celeuthetini
- 9 (10) Rostrum with transverse sulcus at base separating dorsal from head (Fig. 25); 8th sternite in female withdrawn inside 7th, with slender spiculum ventrale (Fig. 50); 8th tergite in female partly covered by 7th at base; 9th sternite in male consisting of a sclerite. Subtribe Celeuthetina s. str.
- 10 (9) Rostrum without transverse sulcus at base (Fig. 3); 8th sternite in female terminal (Figs. 8, 20), without spiculum ventrale (Fig. 13); 8th tergite in female also terminal, uncovered; 9th sternite in male subdivided into three sclerites. Subtribe Isoptera nov.

Tribe **Celeuthetini** LACORDAIRE, 1863

Mandibles with deciduous appendages, with three setae in general; antennal scrobes dorso-lateral or lateral, narrow triangular or bifurcate, ventral furrow running down obliquely in front of eye to the ventrolateral edge; rostrum without pterygia; antennae with scape long, exceeding posteriorly beyond the anterior margin of pronotum when rested, 7-segmented in funicle, club much shorter than funicle; postmentum shortly pedunculate; prementum about as long as broad, labial palpi attached to the inner surface of its apical margin; maxillae partly visible between labium and hypostoma, galea and lacinia fused. Prothorax without ocular lobes. Procoxae often narrowly separated, but coxal cavities connate internally; mesocoxae separated externally, but connate internally. Metacoxae widely separated, contiguous with elytra at sides. Mesepimera much reduced, remote from the base of elytra. Metendosternite transverse, without lateral arms, anterior tendons widely distant. Hind tibiae with inner flange at apex (corbel semienclosed auct.). Claws simple, free. Aedeagus long, its

Figs. 23–38. — 23–26. Rostrum and head of Celeuthetini; 23, *Platyspatus latiscapus* (ex Sulawesi); 24, 25, *Philicoptus waltoni* (ex Mindanao); 26, *Phraotes nodifer* (ex Sulawesi). — 27–30. Antennal funicle of *Neasphalmus* spp.; 27, 29, *N. rotundipennis* (27: ex Kuchinoshima I., 29: ex Okinawa-Hontō I.); 28, *N. okinawanus*; 30, *N. ihai* (ex. Ishigaki I.). — 31–38. Spermatheca of *Neasphalmus* spp. and *Isopterus* spp.; 31, 32, *N. okinawanus* (31: ex Takarajima I., 32: ex Nakanoshima I.); 33, 34, *N. rotundipennis* (33: ex Iejima I., 34: ex Kuchinoshima); 35, *N. ihai* (ex. Ishigaki I.); 36, *I. kotoensis*; 37, *I. variabilis*; 38, *I. macromerus*.

New Subtribe of the Celeuthetini



struts almost reaching cephalad to or beyond the anterior margin of mesothorax. Ovipositor also long, reaching cephalad to the anterior margin of mesothorax, bursa copulatrix not differentiated as pouch, spermathecal duct long, meander.

Subtribe **Celeuthetina** s. str.

= *Coptorrhynchina* VOSS, 1940

= *Platysparina* VOSS, 1940

= *Celeuthetini*: MARSHALL, 1956

Rostrum with sulcus at base separating transversely from head. Female venter with five, four or two visible segments (ventrites), 8th sternite with spiculum ventrale, setose at apex; 9th sternite in male consisting of a sclerite, undivided.

Subtribe **Isopterina** nov.

Type genus: *Isopterus* FAUST, 1895.

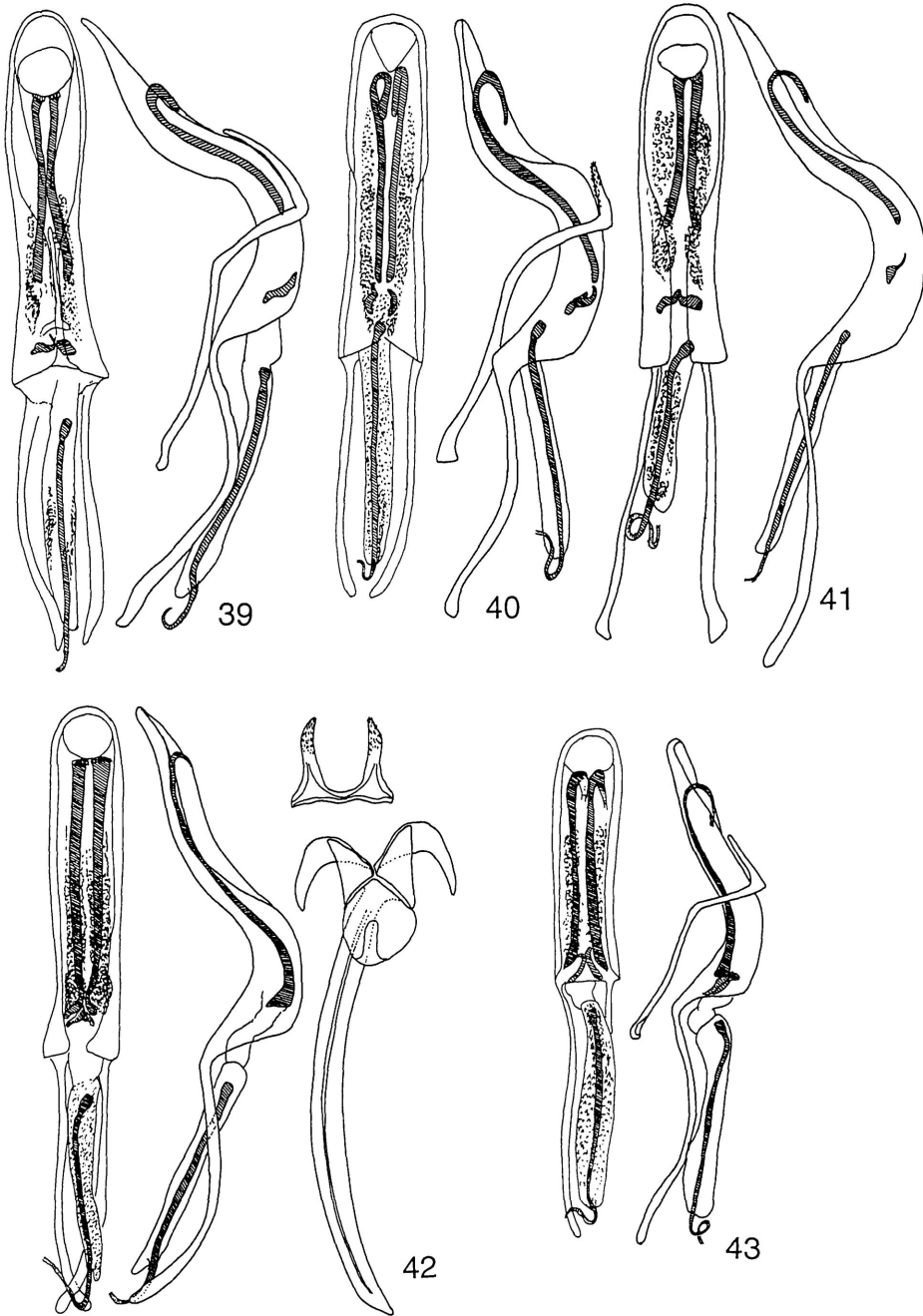
The other genera included: *Arrhaphogaster* ROELOFS, 1873; *Neasphalmus* NAKANE, 1963; *Pseudottistira* HELLER, 1934.

Mandibles with scar a little below the mid-line of outer margin, with dorsal, apical and ventral teeth, with 3–5 setae, not scaled; postmentum shortly but distinctly pedunculate, prementum about as long as broad, labial palpi attached to the inner surface of apical margin, close to each other in position, two-segmented; maxillae partly exposed, galea and lacinia fused. Rostrum not delimited posteriorly by transverse sulcus, shallowly and broadly depressed and bare behind epistome to antennal sockets; antennal scrobes dorso-lateral (*Arrhaphogaster*) or lateral, with or without definite oblique sulcus from antennal socket in addition to the dorsolateral sulcus. Antennae with scape reaching pronotum, funicle 7-segmented, basal two segments slender. Pronotum without ocular lobes. Elytra wholly covering abdomen, with 10 or 12 regular striae. Pro- and mesocoxal cavities narrowly separated externally, but continuous internally. Legs with hind coxae rather broadly touching elytra; femora clavate, tibiae mucronate, corbels with inner flange (=semienclosed), tarsi with 3rd segment deeply bilobate; claws simple, free. Venter visibly 5-segmented in male, first and second ventrites large, second longer than third and fourth combined, 9th sternite subdivided into three sclerites; in female venter visibly 2-segmented and 8th sternite without spiculum ventrale. Metendosternite transverse, without lateral arms, anterior tendons attached near apex.

Among the genera in *Isopterina*, *Arrhaphogaster* is apparently isolated from the rest, and *Isopterus* includes more diverse species than the others. The arrangement of the genera in the following key can be regarded as the reflection of their phylogenetic relationship.

Key to Genera of the Subtribe Isopterina

- 1 (2) Elytra with 12 striae; antennal scrobes dorso-lateral in position, reniform in dorsal aspect, with short, shallow and weak oblique sulcus below antennal



Figs. 39–43. Male aedeagus of *Neaspalmus* spp., dorsal and lateral views; parameres, and 8th and 9th sternites in some species; 39, 40, 41, *N. okinawanus* (39: ex Kuroshima I., 40: ex Nakanoshima I., 41: ex Takarajima I.); 42, 43, *N. ihai* (42: ex Ishigaki I., 43: ex Yonaguni I.).

- socket at each side, their dorsal margins incurved behind antennal sockets in dorsal aspect, then parallel to each other to base; dorsal area between them half as broad as the basal width of rostrum, much narrower than forehead between eyes; eyes small, convex, slightly longer than broad; rostrum not declivous at apex. (Japan: Kantô District).
- *Arrhaphogaster* ROELOFS
- 2 (1) Elytra with 10 striae; antennal scrobes lateral in position, <-shaped, oblique sulcus shallow but definite, dorsal area between them narrowed posteriorly to base; eyes ovate, weakly convex, forehead between them much less than half the width of rostrum at base.
- 3 (4) Rostrum not abruptly declivous at apex, but weakly and evenly bent ventrad and almost bare before antennal sockets; forehead between eyes more than half the width of rostrum; hind tibiae often costate internally at least on basal half and often enlarged internally at about basal third. (Philippines, Taiwan: Lan Yu and Lutao Isls.).
- *Isopterus* FAUST (= *Kotoshozo* KÔNO)
- 4 (3) Rostrum abruptly declivous at apex, lateral margin above antennal scrobe obtusely ridged and arcuate ventrad in lateral aspect.
- 5 (6) Elytra distinctly costate along basal margin, tuberculate. (Philippines: Luzon).
- *Pseudottistira* HELLER
- 6 (5) Elytra not costate along basal margin, smooth. (Japan: Ryukyus).
- *Neasphalmus* NAKANE (= *Borodinophilus* VOSS)

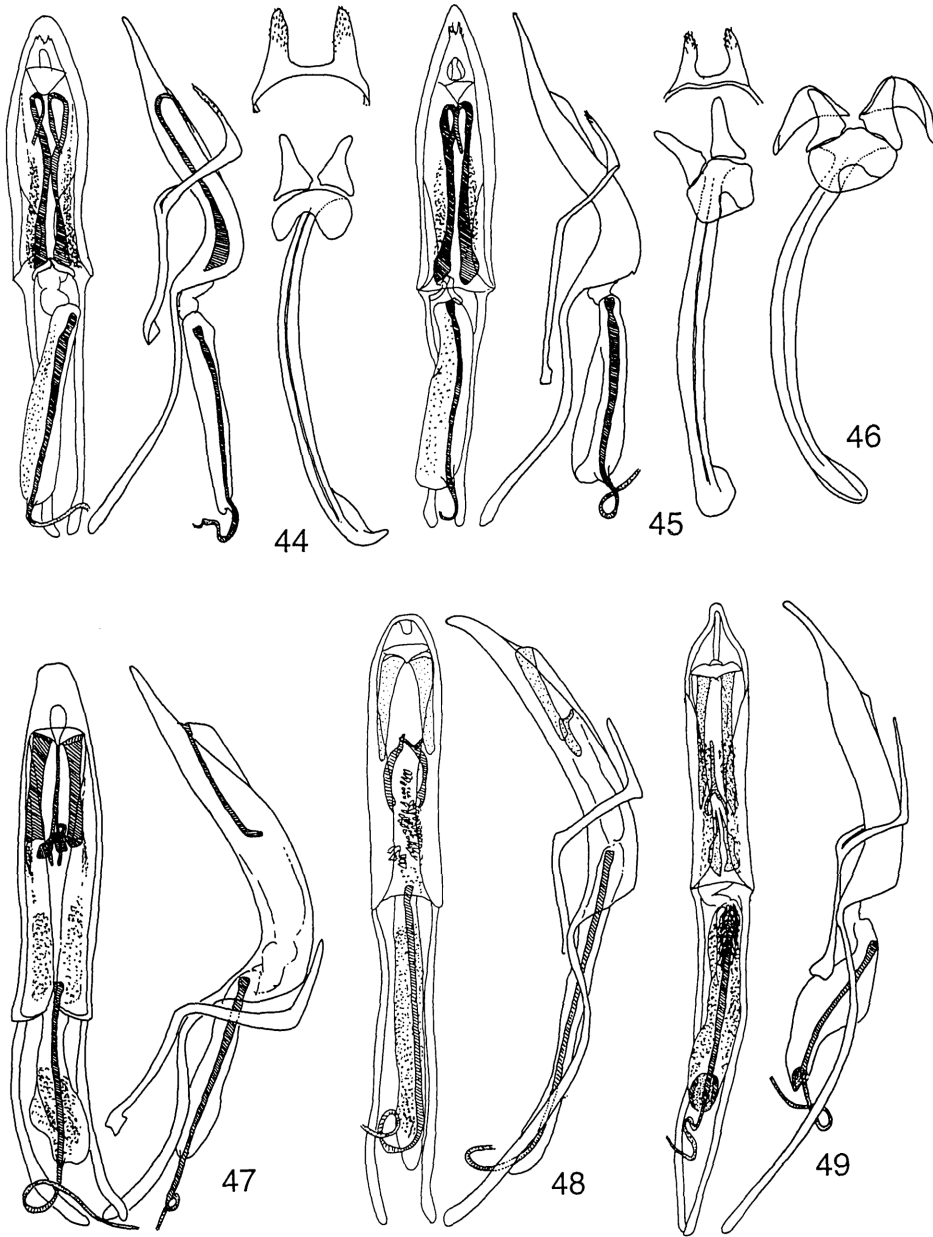
Arrhaphogaster ROELOFS, 1873

Arrhaphogaster ROELOFS, 1873, Anns. Soc. ent. Belg., **16**: 163 (Celeuthetides; type species: *Arrhaphogaster pilosus* ROELOFS, 1873, monobasic). — SHARP, 1896, Trans. ent. Soc. Lond., **1896**: 94. — FAUST, 1897, Stett. ent. Ztg., **58**: 16, note. — KÔNO, 1930, J. Fac. Agric., Hokkaido imp. Univ., **24**: 221, 222. — LONA, 1938, Coleopt. Cat., 162, Otiorrhynchinae III: 507 (Celeuthetini). — MORIMOTO, 1962, J. Fac. Agric., Kyushu Univ., **12**: 32. — MORIMOTO & MIYAKAWA, 1985, Mushi, Fukuoka, **50**: 30 (Key to spp.). — ALONSO-ZARAZAGA & LYAL, 1999, World Cat. Fam. Gen. Curc., 147 (Celeuthetini).

This genus has been placed in the Celeuthetini, but MARSHALL (1956) ignored it in his generic revision, because its distribution is outside the range of the tribe in MARSHALL's viewpoint. This genus comprises two species.

Arrhaphogaster pilosa ROELOFS, 1873

Arrhaphogaster pilosus ROELOFS, 1873, Anns. Soc. ent. Belg., **16**: 164, pl. 2, fig. 3 (Hakodadi=Hakodate). — SHARP, 1896, Trans. ent. Soc. Lond., **1896**: 94 (Yokohama). — KÔNO, 1930, J. Fac. Agric., Hokkaido imp. Univ., **24**: 222 (Abiko, Takao). — YOKOYAMA, 1931, Zoku Nihon no Kôchû, 69, pl. IX, fig. 8. — KAMIYA & ADACHI, 1933, Genshoku Kôchû Zufu, pl. 44, f. 9. — TAKAHASHI, 1930, Kaju Gaichû Kakuron, **1**: 450, fig. 232 (injurious to pear and peach). — WATANABE, 1934, Nihon Jumoku Gaichû Sou Mokuroku, 24, 373, 456 (pear and peach). — NAKANE, 1963, Icon Ins. Japon. Col. nat. ed., **2**: 360, pl. 180, f. 25. — MORIMOTO, 1984, Coleopt. Japan Col., Osaka, **4**: 276,



Figs. 44–49. Male aedeagus of *Neasphalmus* spp. and *Isopterus* spp., dorsal and lateral views; parameres, and 8th and 9th sternites in some species; 44, 45: *N. rotundipennis* (44: ex Okinawa-Hontō I., 45: ex Kuchinoshima I.); 46, 47, *I. kotoensis*; 48, *I. macromerus*; 49, *I. variabilis*.

pl. 54, f. 12. — MORIMOTO & MIYAKAWA, 1985, Mushi, Fukuoka, **50**: 32, fig. 6 C.

Distribution. Japan (Hokkaido: Hakodate—after ROELOFS, 1873; Honshu: Chiba, Tokyo, Izu-Oshima I., Kanagawa, Nagano, Ishikawa). This species was recorded from Hakodate in the original description, but no specimen has been captured in Hokkaido and northern Honshu ever since. This is fairly common in Tokyo, Kanagawa and Chiba Prefs. at present, and old specimens are preserved in the collection of Kyushu University from Nagano (Mt. Yatsugatake, 1918, M. SUZUKI leg.) and Ishikawa (Mt. Sekidô, 1947, T. JOHRAKU).

Biology. The adults feed on the flowers, flower- and leaf buds, and young leaves of pear and peach from the middle spring to the summer, and often give considerable damage.

***Arrhaphogaster hachijoensis* MORIMOTO et MIYAKAWA, 1985**

Arrhaphogaster [sic] *hachijoensis* MORIMOTO et MIYAKAWA, 1985, Mushi, Fukuoka, **50**: 30, fig. 6 AB (Izu Isls.: Hachijô, Miyake and Mikura Isls).

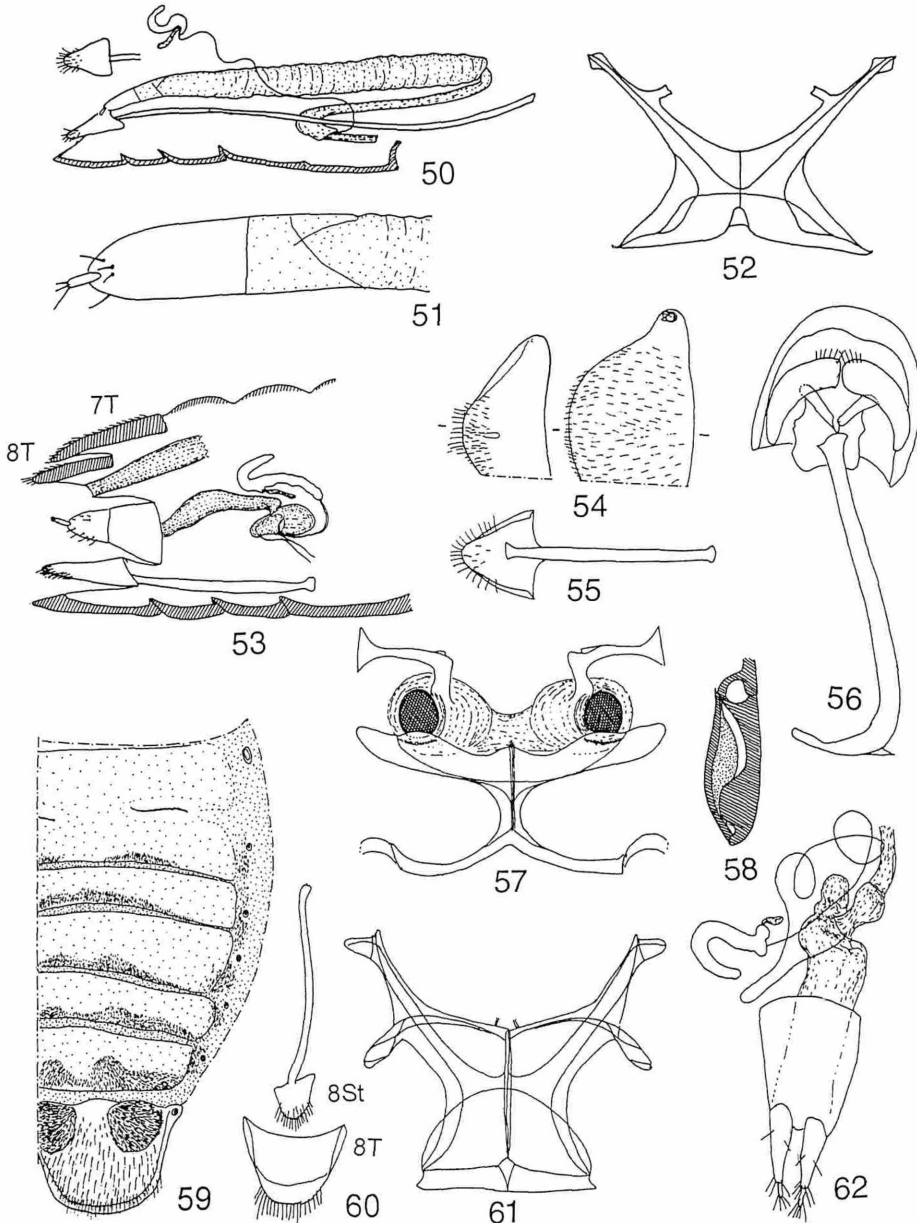
Distribution. Japan: Izu Islands (Hachijô, Miyake and Mikura Isls.)

***Isopterus* FAUST, 1895**

Isopterus FAUST, 1895, Stett. ent. Ztg., **56**: 4 (Scythropini; type not designated). — HELLER, 1912, Philipp. J. Sci., **7**: 388 (Scythropidae). — EMDEN, 1936, Stett. ent. Ztg., **97**: 70 (Otiorrhynchinae). — LONA, 1938, Coleopt. Cat., (162), Otiorrhynchinae: 526 (in genera incertae sedis). — GÜNTHER, 1943, Dt. ent. Z., Iris, **1943**: 58 (Celeuthetini; key to spp.). — MARSHALL, 1956, Otiorrhynch. Curc. Celeuthetini, 5 (Comp. w. *Pseudottistira*; excl. from Otiorrhynchinae). — ALONSO-ZARAZAGA & LYAL, 1999, World Cat. Fam. Gen. Curc., 187 (Entiminae, incertae sedis).
Kotoshozo KÔNO, 1942, Ins. Mats., **16**: 23 (Pachyrrhynchini; type species: *Kotoshozo kotoensis* KÔNO, 1942, by original designation). — ALONSO-ZARAZAGA & LYAL, 1999, World Cat. Fam. Gen. Curc., 170 (Pachyrrhynchini)—*syn. nov.*

This genus was revised by GÜNTHER (1943), who recognized 6 species and 7 subspecies in the Philippines and a key to them was provided. *Kotoshozo kotoensis* was originally described by KÔNO (1942) in the Pachyrrhynchini from Kotosho (=Lan Yu Island, south-east off Taiwan), but is synonymous with *Isopterus* as newly treated in this paper. The type species of the latter is easily recognized in the following emendation of GÜNTHER's key (p. 59, first and second couplets):

- 1 (14) Fore femora edentate.
- 2 (5) Hind femora also edentate; fore tibiae slightly curved inwards, of the same width throughout.
- 3 (4) Hind tibiae distinctly enlarged internally at basal third; legs robust, fore tibiae much thicker than antennal scape; forehead between eyes about quarter as wide as the maximum width of rostrum.
. *Isopterus kotoensis* (KÔNO), comb. nov.
- 4 (3) Hind tibiae of the same width throughout; legs slender, fore tibiae almost as



Figs. 50–62. — 50–52. *Philicoptus waltoni* (ex. Mt. Makiling, Luzon); 50, ovipositor and 8th sternite; 51, distal part of ovipositor, enlarged; 52, metendosternite. — 53–58. *Elytrurus subangulatus* (ex Fiji); 53, ovipositor, semidiagrammatical; 54, 7th and 8th tergites; 55, 8th sternite; 56, male 8th tergite, 8th sternite and 9th sternite; 57, metendosternite; 58, ditto, lateral aspect. — 59–62. *Ottistiria* sp., female (ex New Britain); 59, tergum of abdomen; 60, 8th tergite and 8th sternite; 61, metendosternite; 62, ovipositor, dorsal.

- thick as antennal scape; forehead between eyes about a half as wide as the maximum width of rostrum. *Isopterus minutus* GÜNTHER
5 (2) Hind femora dentate. (continued to couplet 4 of GÜNTHER's key)

***Pseudottistira* HELLER, 1934**

Pseudottistira HELLER, 1934, Philipp. J. Sci., **54**: 289 (aberrant genus in Celeuthetini, near *Celeuthetes*; type species: *Pseudottistira subtuberculata* HELLER, 1934, monobasic). — MARSHALL, 1956, Otiior. tribe Celeuthetini, 4 (excluded from Celeuthetini). — ALONSO-ZARAZAGA & LYAL, 1999, World Cat. Fam. Gen. Curc., 149 (Celeuthetini).

This genus is known to contain only the type species from Luzon, of which the important features were well illustrated in the original description.

***Neasphalmus* NAKANE, 1963**

Neasphalmus NAKANE, 1963, Fragm. Coleopterol., pars 9: 35 (near *Asphalmus*; type species: *Neasphalmus okinawanus* NAKANE, 1963, by monotypy). — MORIMOTO, 1984, Coleopt. Japan Col., Osaka, **4**: 276.

Borodinophilus VOSS, 1971, Mem. Fac. Educ., Kagawa Univ., (II), (202): 46 (Celeuthetini; type species: *Borodinophilus ihai* VOSS, 1971). — *syn. nov.*

This genus includes so similar species as MORIMOTO (1984) once regarded them as one species, but are markedly different in the structure of male genitalia. Weevils of this genus are variable in general shape and pilosity of elytra; namely, the elytra are ovate and evenly rounded from humeri to apices in males and in smaller females, or straightly expanded for a short distance from humeri to above hind coxae, then rounded to apices in larger females; and thus the elytra are angulately rounded at the broadest point on each side. The suberect scales on the elytra are generally evident on caudal half, but are often conspicuous on whole part, or appressed or declined and only visible in lateral aspect, they are scale-like and more or less clavate in general, or slender and setaceous in some cases, and no species distinction are noticed.

The adults feed frequently on sprout and young plant of suash, cucumber and water-melon in farm and garden.

Key to Species

- 1 (4) Male aedeagus almost parallel-sided or weakly sinuate at sides, broadly rounded at apex before ostium when viewed dorsally (Figs. 39-43); spermatheca with apical part shorter than basal part ($A < B$ in Fig. 31); second ventrite with punctures sparser, intervals between punctures at least as great as the diameter of punctures in medio-basal area in female.
- 2 (3) Male aedeagus arcuate dorsally in basal half when viewed laterally (Figs. 39, 40, 41). Kuroshima I., Nakanoshima I., Takarajima I.
. *Neasphalmus okinawanus* NAKANE, 1963

- 3 (2) Male aedeagus arcuate dorsally in basal quarter when viewed laterally (Figs. 42, 43). Ishigaki I., Iriomote I., Yonaguni I., Daitô I.
 *Neasphalmus ihai* (Voss, 1971)
- 4 (1) Male aedeagus tapered apically in front of middle and narrowly rounded at apex when viewed dorsally (Figs. 44, 45); spermatheca with apical part longer than basal part ($A > B$ in Fig. 31); second ventrite with punctures larger, intervals between punctures at most as great as the diameter of punctures. Okinawa-Hontô I., Iejima I., Kuchinoshima I.
 *Neasphalmus rotundipennis* NAKANE, 1963, stat. nov.

***Neasphalmus okinawanus* NAKANE, 1963**

Neasphalmus okinawanus NAKANE, 1963, *Fragm. Coleopterol.*, pars 9: 35 (Nakanoshima, Tokaras); 1963, *Icon. Ins. Japon. Col. nat. ed.*, 2: 361, pl. 181, fig. 4. — MORIMOTO, 1984, *Coleopt. Japan Col.*, Osaka, 4: 276, pl. 64, fig. 16.

Distribution. Japan: Kuroshima I., Nakanoshima I., Takarajima I.

***Neasphalmus rotundipennis* NAKANE, 1963, stat. nov.**

Neasphalmus okinawanus rotundipennis NAKANE, 1963, *Fragm. Coleopterol.*, pars 9: 35 (Okinawa). — MORIMOTO, 1984, *Coleopt. Japan Col.*, Osaka, 4: 276 (in part).

Distribution. Japan: Okinawa-Hontô I., Iejima I., Kuchinoshima I.

***Neasphalmus ihai* (Voss, 1971), comb. nov.**

Borodinophilus ihai Voss, 1971, *Mem. Fac. Educ., Kagawa Univ.*, (II), (202): 47 (Is. Borodino). — MORIMOTO, 1984, *Coleopt. Japan Col.*, Osaka, 4: 276 (in part).

Voss described this species on three specimens from Is. Borodino (Minami-Daitô I.), and another one specimen from Okinawa was noted as “variation?”. The holotype, one paratype and the last mentioned specimen in the Chûjô collection were examined. These are all females, a little broken, and mounted on respective cards. Specimens from Ishigaki, Iriomote and Yonaguni Is. are tentatively identified as *N. ihai* on external examination.

Distribution. Japan: Ishigaki I., Iriomote I., Yonaguni I., Daitô I.

要 約

森本 桂・小島弘昭：ヒメカタゾウムシ族に新亜族 Isopterina の創設とこれの近似族との関係。—— ヒメカタゾウムシ族に関する総説で MARSHALL (1956) が除外した属，所属不明の属，および KONO (1942) が紅頭嶼からカタゾウムシ族で記載した *Kotoshozo* を含む6属を再検討して4属に整理し，吻基部に溝がないこと，雌腹部は外見上2節で，第8腹板に支柱突起を欠くこと，雄第9腹節が3小片に分かれることなどの特徴で，新亜族 Isopterina を創設してヒメカタゾウムシ族に含めた。この亜族はフィリッピン，台湾（蘭嶼，緑島），日本（琉球列島，関東地方，伊豆諸島）に分布する。

NAKANE (1963) の記載した *Neasphalmus* 属は, *N. okinawanus* (トカラ中之島) とその亜種 *rotundipennis* (沖縄) を含み, また大東島から記載された *Borodinophilus ihai* Voss, 1971 もこの属のシノニムである。これらは外見上酷似し, しかもかなりの個体変異を示すにもかかわらず, 雄交尾器は明瞭に3つの型を示すことから, これらを次ぎの3種とした。1) *Neasphalmus okinawanus* NAKANE, 1963 ニセホソヒメカタゾウムシ (黒島, 中之島, 宝島), 2) *N. rotundipennis* NAKANE, 1963 オキナワホソヒメカタゾウムシ (新称) (沖縄本島, 伊江島, 口之島), 3) *N. ihai* (Voss, 1971) ヤエヤマホソヒメカタゾウムシ (新称) (石垣島, 西表島, 与那国島, 大東島)。今回の研究では, 上記以外の島の標本を調べることができず, また大東島産も雌だけで, 触角や点刻などから八重山産と同種としておいた。さらに, トカラ群島に2種分布することなど生物地理学上の問題や, 今回標本を調べることができなかった奄美群島などを含めた種分類については, 今後十分の標本を集積した再検討が望まれる。

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