

Female Reproductive Organs of Cerambycid Beetles from Japan and the Neighbouring Areas

IV. Callichromini through Cleomenini

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Abstract Thirty-eight species of cerambycine longicorn beetles are examined for their female reproductive organs. They are distributed to 29 genera of 6 tribes (Callichromini through Cleomenini). General discussion is given on the whole subfamily, concluding that the female genitalia are generally not useful for determining interrelationship of cerambycine tribes and genera, but that the Pyrestini and Purpuricenini are highly specialized and the Oabriini must be the most specialized of the Japanese members of the subfamily Cerambycinae.

In the last part dealing with the Cerambycinae, 29 genera of 6 tribes are taken up and 38 species in total are examined for their female reproductive organs. They are the Callichromini (4 spp. of 2 genn.), Callidiini (8 spp. of 5 genn.), Clytini (16 spp. of 14 genn.), Anaglyptini (5 spp. of 4 genn.), Purpuricenini (3 spp. of 2 genn.), and Cleomenini (2 spp. of 2 genn.). A general discussion on the subfamily Cerambycinae will be given after the descriptive part, and references supplementary to those given at the end of the first part will also be compiled.

Results

Tribe Callichromini

Aromia moschata orientalis PLAVILSTSHIKOV, 1933

(Figs. 131–133)

Collecting data of the material used. Abashiri River, Memanbetsu, Hokkaido, 14–VIII–1979, T. MATSUMOTO leg.

Paraproct moderate in size, its baculi almost straight, rather thick, thickened at the bases and protruding to each lateral side; valvifer distinct with slightly curved thin baculi; coxite rather broad and narrowed towards the apex, its baculi thin and slightly sinuate; coxite lobes broad but rather short, with long tactile hairs; stylus moderate in size, rather heavily sclerotized except for apex; dorsal baculi shorter than paraproct baculi, thin and slightly sinuate; proctiger baculi thin, bent at the apical parts; vaginal plates very narrow; bursa copulatrix swollen in apical half, constricted at the middle

and narrow in basal half; spermatheca bent at middle, rather heavily sclerotized and clearly distinguishable from the duct; spermathecal gland attached to near the base at the outer side of the capsule; spermathecal duct short, thick, straight and entering into the vagina.

***Chloridolum (Chloridolum) lochooanum* GRESSITT, 1934**

(Figs. 134–136)

Collecting data of the material used. Hatsuno, Amami-ohshima Is., Kagoshima Pref., 5–VII–1972, S. OKAJIMA leg.

Paraproct moderate in size, with thin baculi which are rectangularly bent outwards at the bases; valvifer distinct, its baculi thin, almost straight, and continuing anteriorly to paraproct baculi; coxite baculi sinuate and with inwardly sclerotized areas at each base; coxite rather short; stylus moderate in size, sclerotized except for the apex; dorsal baculi shorter than paraproct baculi, thin and slightly sinuate; proctiger baculi slightly sinuate; vaginal plates long, dilated towards the apex in apical third; bursa copulatrix very large, constricted at basal third; spermatheca bent near the middle and moderately sclerotized; spermathecal duct thick, sinuate, sclerotized at base, and entering into an impression at the basal part of bursa copulatrix.

Notes. In the two other Japanese species of the genus, *C. (C.) thaliodes* BATES and *C. (Leontium) viride* (THOMSON), the bases of the bursa copulatrix are also impressed or hollowed. In *C. (C.) thaliodes*, the basal part of the spermathecal duct is sclerotized as in *C. (C.) lochooanum*, but not in *C. (L.) viride*.

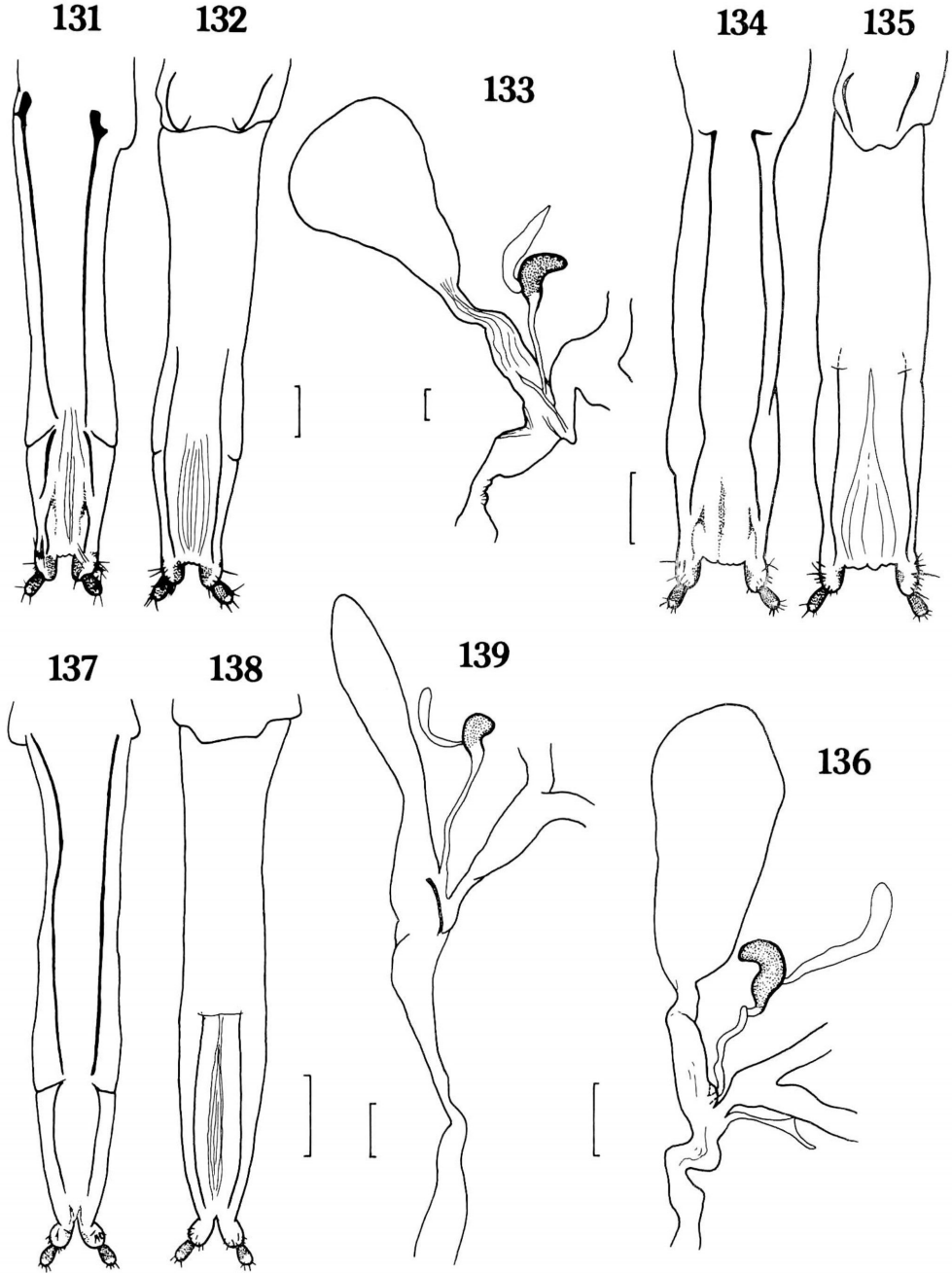
Tribe Callidiini

***Ropalopus (Proropalopus) signaticollis* SOLSKY, 1872**

(Figs. 137–139)

Collecting data of the material used. Data unknown.

Paraproct moderate in size, its baculi rather thick and slightly sinuate; valvifer distinct with slightly curved baculi; coxite very short, with very short and thin baculi, and well constricted at the apex; coxite lobes rather broad, weakly sclerotized, and with short tactile hairs; stylus rather heavily sclerotized except for the apex; dorsal baculi a little longer than half the length of paraproct baculi, and slightly curved; proctiger absent; vaginal plates very narrow and sclerotized; bursa copulatrix long but rather narrow; spermatheca curved at middle, weakly sclerotized in apical two-thirds, but hardly sclerotized in basal third; spermathecal duct thick, slightly sinuate and entering into the basal part of bursa copulatrix.



Figs. 131–139. — 131–133, *Aromia moschata orientalis*; 134–136, *Chloridolum (Chloridolum) loochooanum*; 137–139, *Ropalopus (Proropalopus) signaticollis*. Ovipositor, ventral view (131, 134, 137); ovipositor, dorsal view (132, 135, 138); internal reproductive organs (133, 136, 139). (Scale: 0.5 mm.)

Callidium (Callidium) violaceum (LINNAEUS, 1758)

(Figs. 140–142)

Collecting data of the material used. Sunagawa-shi, Hokkaido, 19–VI–1981, R. SAITO leg.

Paraproct extremely long, with small sclerotized part at each outer side at the base, its baculi thick and almost straight; valvifer distinct with thick and straight baculi; coxite short and very narrow, with thin baculi; coxite lobes rather narrow; stylus somewhat broad, moderately sclerotized except for the apex; dorsal baculi shorter than half the length of paraproct baculi; proctiger baculi extremely short and thin; vaginal plates very narrow; bursa copulatrix long but rather narrow; spermatheca curved at middle, its sclerotization becoming heavier towards both apex and base; spermathecal duct short, straight and entering into the basal part of bursa copulatrix.

Callidiellum refipenne (MOTSCHULSKY, 1860)

(Figs. 143–145)

Collecting data of the material used. Kominawa, Takao, Tokyo Met., 21–IV–1981, M. SAKAI leg.

Paraproct long, with thick and almost straight baculi; valvifer distinct, its baculi thick and connected with paraproct baculi at the bases; coxite baculi bifurcate at middle, the area between the baculi being sclerotized; coxite lobes rather long and narrow, hardly sclerotized, and with some tactile hairs; stylus fairly long, and sclerotized except for the apex; dorsal baculi shorter than paraproct baculi, thin and almost straight; proctiger baculi slightly curved; vaginal plates long and straight, filiform; bursa copulatrix broad, abruptly bent at the base; spermatheca weakly sclerotized, slightly curved at middle, and constricted at the base, with the gland small and attached to the middle of outer side; spermathecal duct thin, coiled several times and entering into basal third of bursa copulatrix.

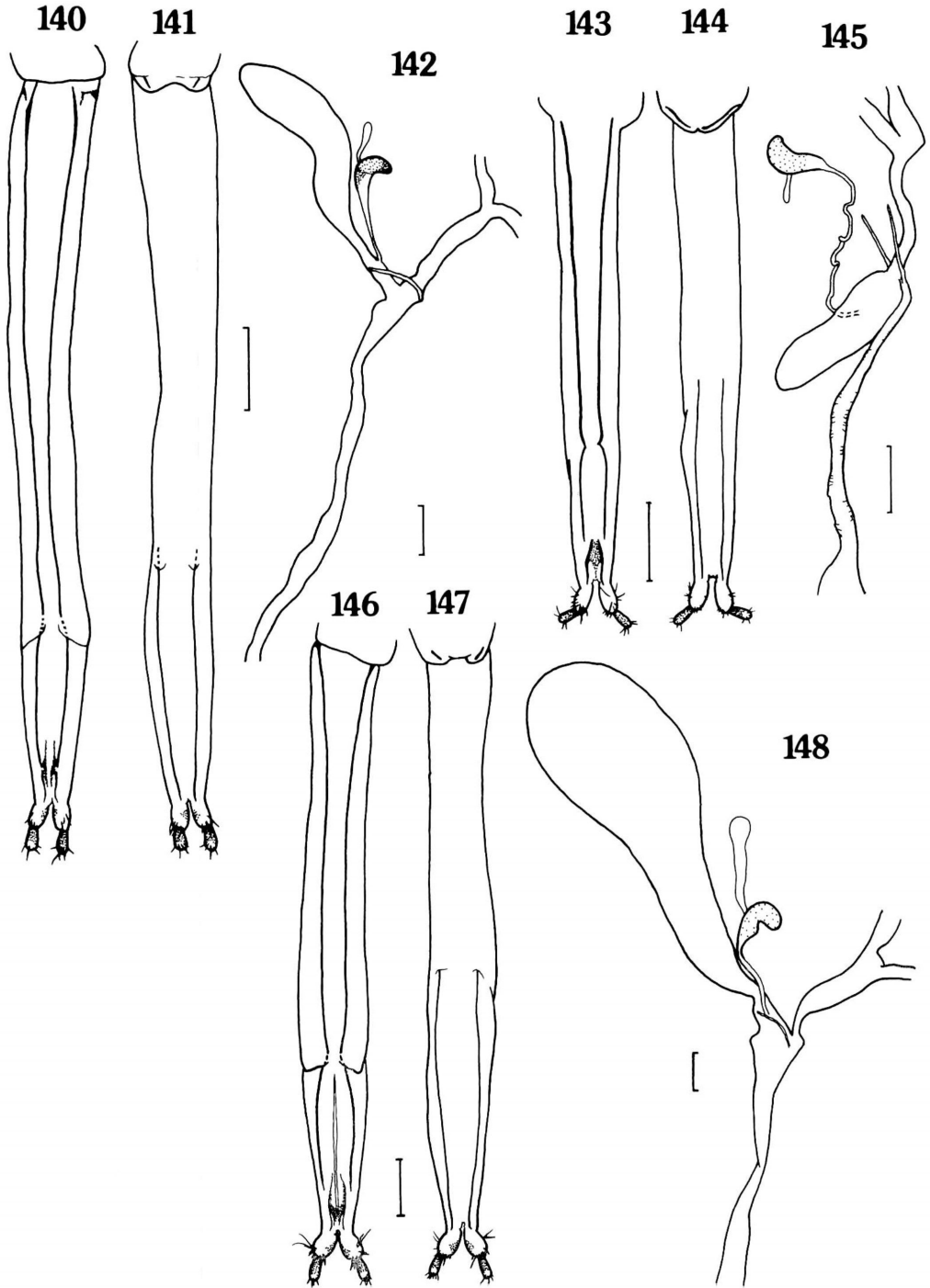
Semanotus japonicus (LACORDAIRE, 1869)

(Figs. 146–148)

Collecting data of the material used. Sugitate, Matsuyama-shi, Ehime Pref., 4–IV–1974, Y. NORSU leg.

Paraproct long, its baculi rather thick and slightly sinuate; valvifer distinct and somewhat long, with thick baculi; coxite narrow, with thin but inwardly sclerotized baculi; coxite lobes broad; stylus moderate in size, sclerotized except for the apex; dorsal baculi shorter than paraproct baculi, thin and almost straight; proctiger baculi

Figs. 140–148. — 140–142, *Callidium (Callidium) violaceum*; 143–145, *Callidiellum rufipenne*; 146–148, *Semanotus japonicus*. Ovipositor, ventral view (140, 143, 146); ovipositor, dorsal view (141, 144, 147); internal reproductive organs (142, 145, 148). (Scale: 0.5 mm.)



very short and thin; vaginal plates filiform; bursa copulatrix very large, swollen in the apical part and gradually narrowed towards the base; spermatheca weakly sclerotized, bent at middle, and with an internal protrusion in basal half; spermathecal duct short, thick, almost straight, and entering into the basal part of bursa copulatrix.

Phymatodes (Phymatodes) testaceus (LINNAEUS, 1758)

(Figs. 149–151)

Collecting data of the material used. Ban'yasawa, Tateiwa-mura, Fukushima Pref., 18–VI–1983, A. SAITO leg.

Paraproct moderate in size, its baculi thin and slightly sinuate; valvifer distinct with thin baculi; coxite constricted at apex, with very short and simple baculi; coxite lobes weakly sclerotized; stylus moderate in size and weakly sclerotized except for the apex; dorsal baculi almost straight, rather long and almost of the same length as paraproct baculi; proctiger baculi thin and slightly curved; vaginal plates very narrow, aciculate; bursa copulatrix large, swollen in apical two-thirds, and constricted at basal third; spermatheca curved and hardly sclerotized; spermathecal duct thick, very short, and entering into the base of bursa copulatrix.

Phymatodes (Phymatodellus) vandykei GRESSITT, 1935

(Figs. 152–154)

Collecting data of the material used. Otaru, Hokkaido, 30–IV–1979 (emerged at Nakano, Tokyo).

Paraproct moderate in size, its baculi thin and slightly sinuate; valvifer distinct, with thin and almost straight baculi; coxite devoid of baculi; coxite lobes rather short, hardly sclerotized; stylus weakly sclerotized except for the apex; dorsal baculi almost straight, and shorter than paraproct baculi; proctiger absent; vaginal plates filiform and somewhat sclerotized; bursa copulatrix large but not swollen; spermatheca abruptly bent at base and also at apical third, hardly sclerotized; spermathecal duct very short and thin, entering into the basal part of bursa copulatrix.

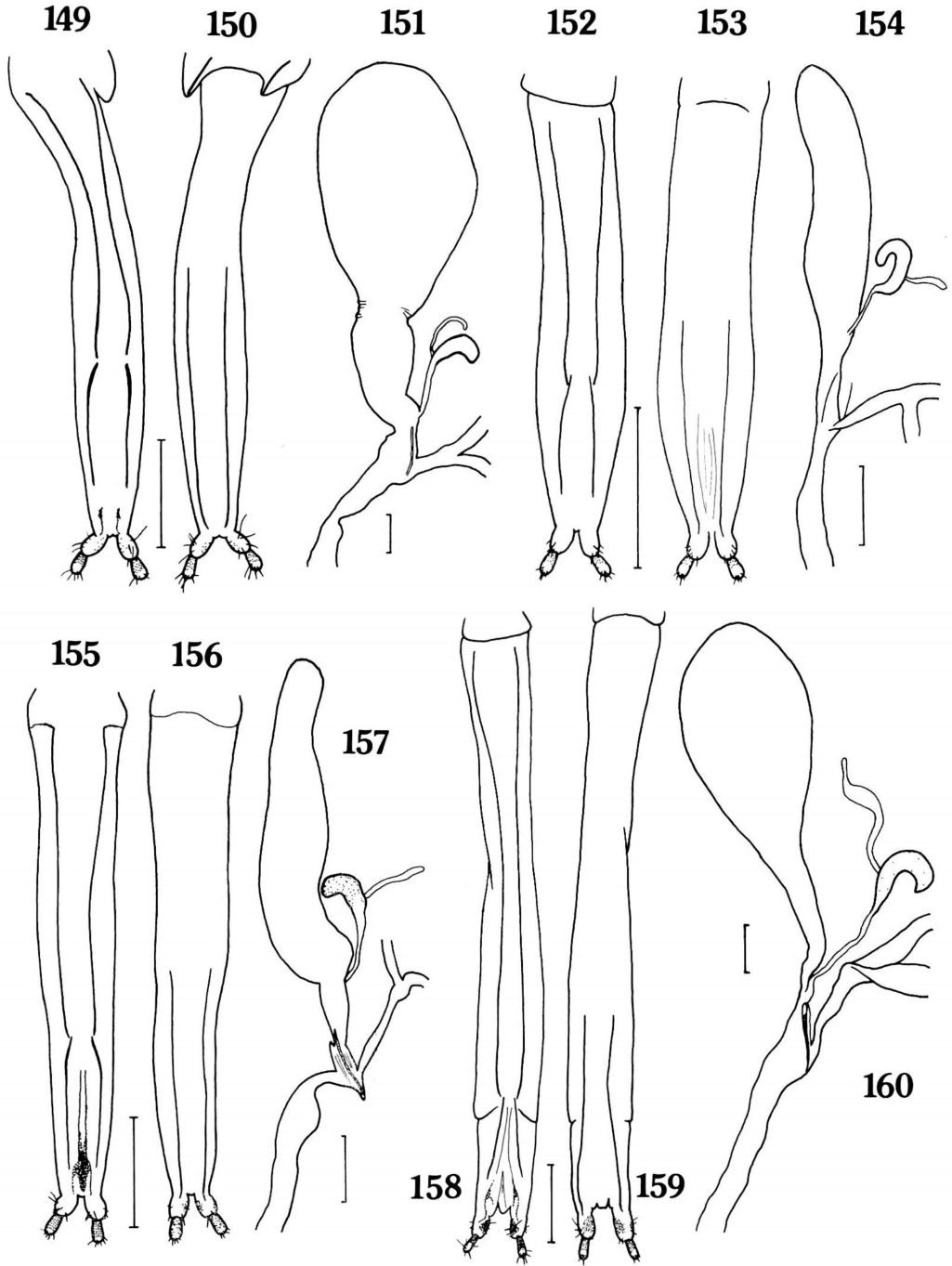
Phymatodes (Poecilium) maaki KRAATZ, 1873

(Figs. 155–157)

Collecting data of the material used. Masutomi, Sudama-chô, Yamanashi Pref., 22–V–1971, H. KOBAYASHI leg.

Paraproct rather long, its baculi thin, slightly sinuate, and rectangularly bent at

Figs. 149–160. — 149–151, *Phymatodes (Phymatodes) testaceus*; 152–154, *P. (Phymatodellus) vandykei*; 155–157, *P. (Poecilium) maaki*; 158–160, *Xylotrechus cuneipennis*. Ovipositor, ventral view (149, 152, 155, 158); ovipositor, dorsal view (150, 153, 156, 159); internal reproductive organs (151, 154, 157, 160). (Scale: 0.5 mm.)



the bases; valvifer distinct, with thin and long baculi; coxite constricted at apex, its baculi short but extending their sclerotized parts towards the base of valvifer; coxite lobes hardly sclerotized; stylus weakly sclerotized except for the apex; dorsal baculi thin, slightly sinuate, and shorter than paraproct baculi; proctiger absent; vagina abruptly dilated at the base, forming a dish-like dilatation; vaginal plates very long, filiform and weakly sclerotized; bursa copulatrix very long, constricted at basal fourth; spermatheca curved and weakly sclerotized; spermathecal duct very short, entering into the constriction of bursa copulatrix at its basal fourth.

Notes. In another Japanese species of the genus, *P. (Paraphymatodes) albicinctus* BATES, the bursa copulatrix is also attached to a dish-like dilatation at the base of the vagina.

Tribe Clytini

Xylotrechus cuneipennis (KRAATZ, 1879)

(Figs. 158–160)

Collecting data of the material used. Shindenbara, Tateiwa-mura, Fukushima Pref., 17–VI–1983, A. SAITO leg.

Paraproct long, its baculi thin and slightly sinuate; valvifer distinct and with thin and almost straight baculi; coxite hardly constricted, its baculi sinuate and inwardly sclerotized in basal halves; coxite lobes moderate in size; stylus moderately sclerotized except for the apex; dorsal baculi thin, sinuate and shorter than half the length of paraproct baculi; proctiger absent; vaginal plates very narrow, straight and heavily sclerotized except for the apices; bursa copulatrix ovoid in the apical part, and gradually narrowed towards the base; spermatheca abruptly bent at middle and hardly sclerotized; spermathecal duct short, thick, slightly sinuate, and entering into the base of bursa copulatrix.

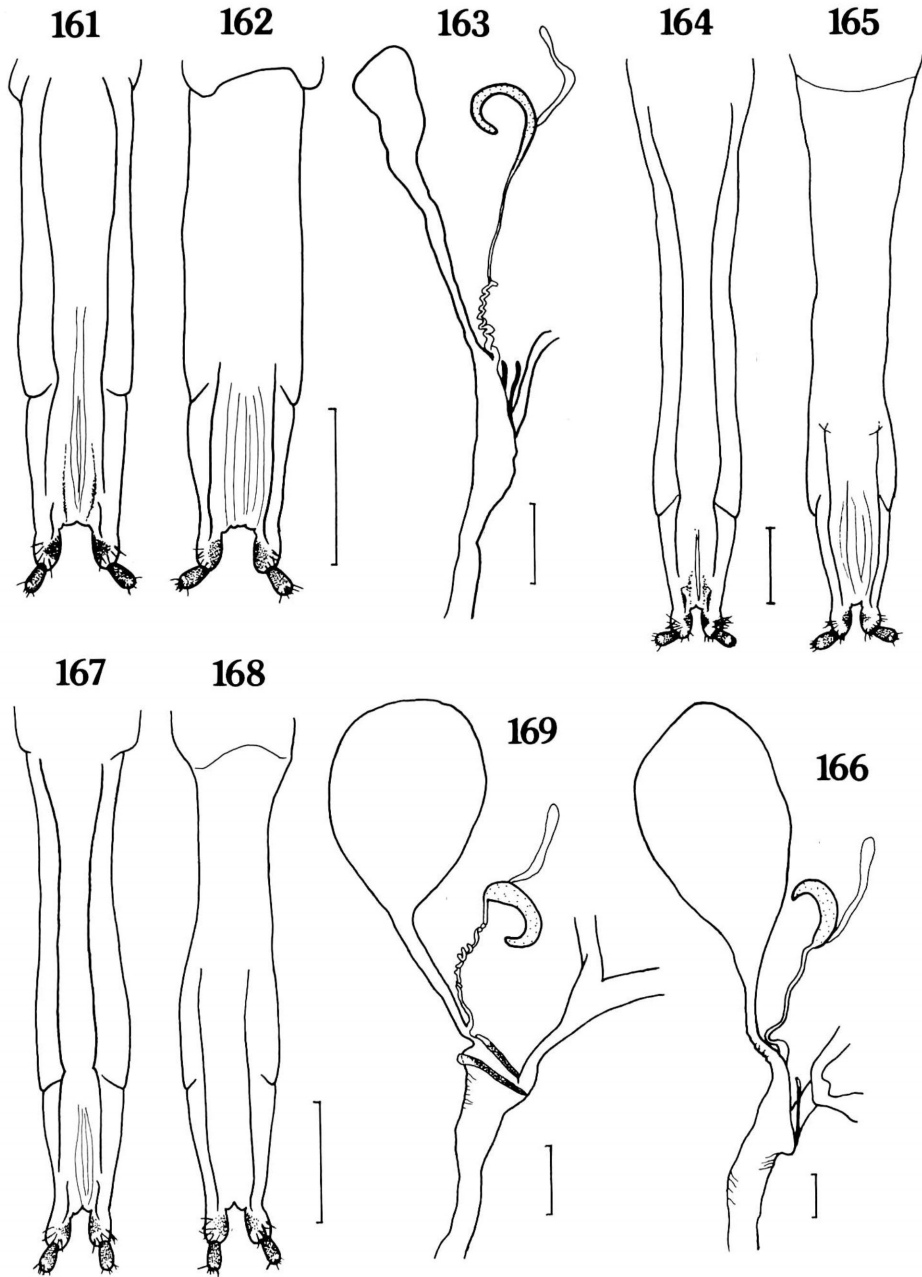
Notes. In *X. rusticus* (LINNAEUS, 1758), the female genitalia are similar in general conformation to those of this species.

Perissus kiusiuensis kiusiuensis OHBAYASHI, 1958

(Figs. 161–163)

Collecting data of the material used. Minamitane, Tanegashima Is., Kagoshima Pref., emerged 7–IV–1984, K. MORI leg.

Paraproct moderate in size, its baculi thin and slightly sinuate; valvifer distinct with straight baculi which are connected with paraproct baculi at the bases; coxite hardly constricted, with short baculi; coxite lobes rather heavily sclerotized at each inner side; stylus rather large and heavily sclerotized except for the apex; dorsal baculi thin, slightly sinuate, and much shorter than paraproct baculi; proctiger absent; vaginal plates narrow, slightly sinuate, and heavily sclerotized except for the apices; bursa



Figs. 161–169. — 161–163, *Perissus kiusiuenis kiusiuenis*; 164–166, *Cyrtoclytus caproides caproides*; 167–169, *Clytus melaenus*. Ovipositor, ventral view (161, 164, 167); ovipositor, dorsal view (162, 165, 168); internal reproductive organs (163, 166, 169). (Scale: 0.5 mm.)

copulatrix fairly large in apical half; spermatheca very narrow, strongly curved as a whole, and weakly sclerotized; spermathecal duct thin and straight in basal half, coiled many times in apical half, and entering into the base of bursa copulatrix.

***Cyrtoclytus caproides caproides* (BATES, 1873)**

(Figs. 164-166)

Collecting data of the material used. Marunuma, Katashina-mura, Gunma Pref., 21-VI-1978, A. TAKASU leg.

Paraproct long, its baculi thick and sinuate; valvifer distinct, with rather thin baculi which are connected with paraproct baculi at the bases; coxite baculi short but thick; coxite lobes rather heavily sclerotized at each inner side; stylus rather heavily sclerotized except for the apex; dorsal baculi short and thin, almost a half as long as paraproct baculi; proctiger absent; vaginal plates filiform and heavily sclerotized; bursa copulatrix very large in apical two-thirds, narrow in basal third; spermatheca curved and weakly sclerotized; spermathecal duct sinuate, abruptly curved and thickened at the apex just before entering into the basal part of bursa copulatrix.

Notes. The spermathecal duct is also thickened at the apex in *Brachyclytus singularis* KRAATZ, 1879.

***Clytus melaenus* BATES, 1884**

(Figs. 167-169)

Collecting data of the material used. Masho Pass, Fukui Pref., 18-V-1982, T. MATSUMOTO leg.

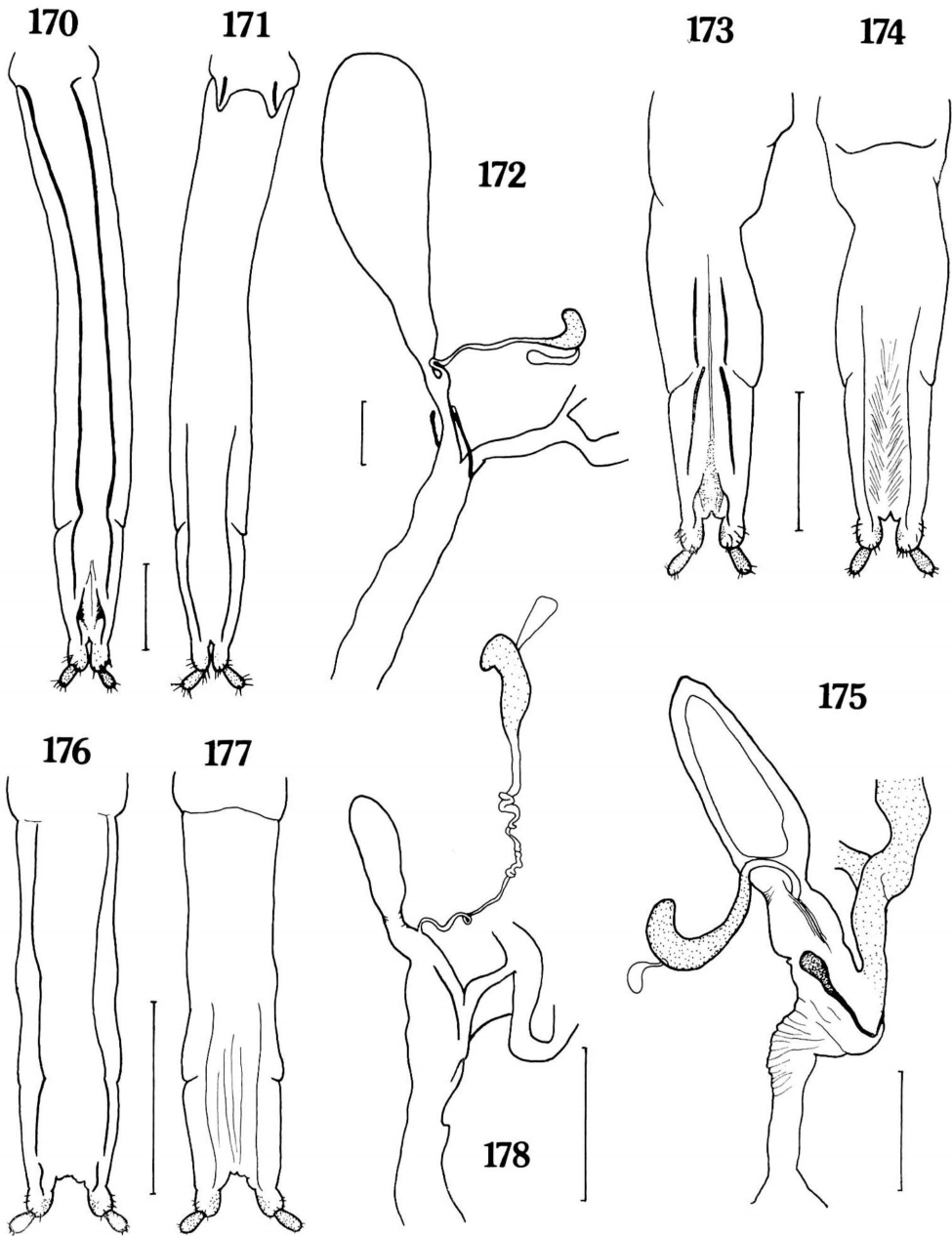
Paraproct moderate in size, its baculi rather thick and slightly sinuate; valvifer distinct, with straight baculi which are basally connected with paraproct baculi; coxite baculi thin and sinuate; coxite lobes moderately sclerotized, especially at the inner sides; stylus rather large and moderately sclerotized except for the apex; dorsal baculi thin and a little shorter than paraproct baculi; proctiger absent; vaginal plates narrow and heavily sclerotized except for the apices; bursa copulatrix ovoid in apical half, constricted at the middle and narrow in basal half; spermatheca strongly curved, hardly sclerotized; spermathecal duct coiled many times except for the basal and apical parts, entering to near the base of bursa copulatrix.

Notes. In *Kazuoclytus lautoides* (HAYASHI, 1950), the spermathecal duct is also coiled as in this species.

***Plagionotus pulcher* (BLESSIG, 1879)**

(Figs. 170-172)

Collecting data of the material used. Shindenbara, Tateiwa-mura, Fukushima Pref., 17-VI-1983, A. SAITO leg.



Figs. 170–178. — 170–172, *Plagionotus pulcher*; 173–175, *Epiclytus yokoyamai*; 176–178, *Amamiclytus subnitidus*. Ovipositor, ventral view (170, 173, 176); ovipositor, dorsal view (171, 174, 177); internal reproductive organs (172, 175, 178). (Scale: 0.5 mm.)

Paraproct long, its baculi thick, sinuate, and rectangularly bent outwards at the bases; valvifer distinct, with thick baculi which are connected with paraproct baculi at the bases; coxite baculi weakly curved, with sclerotized areas inwards; coxite lobes hardly sclerotized; stylus weakly sclerotized except for the apex; dorsal baculi thin, almost a half as long as paraproct baculi; proctiger baculi short, thick and straight; vaginal plates filiform and sclerotized except for the apical parts; bursa copulatrix broad and gradually narrowed towards the base; spermatheca bent at middle, blunt at the apex, and weakly sclerotized; spermathecal duct slightly sinuate, abruptly curved and thickened at the apical part, and entering into the basal part of bursa copulatrix.

Notes. In *Rhaphuma xenisca* (BATES, 1884), *R. diminuta diminuta* (BATES, 1884), *Chlorophorus japonicus* (CHEVROLAT, 1863) and *Grammographus notabilis notabilis* (PASCOE, 1862), general conformation of female genitalia is very similar to that in this species except for one character which is the thickness of the apical part of the spermathecal duct.

***Epiclytus yokoyamai* (KANO, 1933)**

(Figs. 173–175)

Collecting data of the material used. Near Masutomi, Sudama-chô, Yamanashi Pref., 13–VI–1987, R. INAGAWA leg.

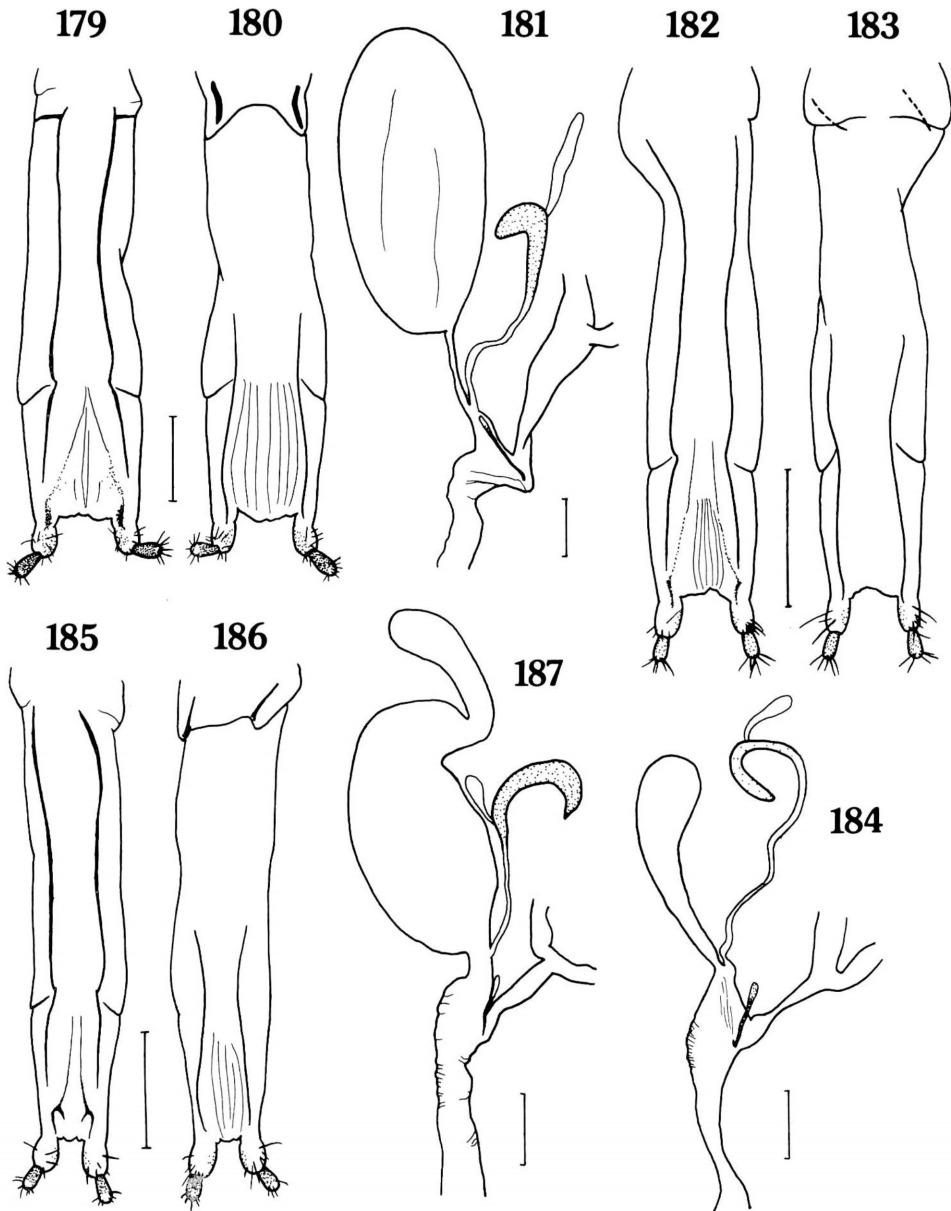
Paraproct short, its baculi very short though rather thick, and almost straight; valvifer distinct with straight and rather thick baculi; coxite baculi sinuate; coxite lobes rather broad, weakly sclerotized at each inner side, and with some tactile hairs; stylus narrow, weakly sclerotized except for the apex, which bears tactile hairs; dorsal baculi long and thin, obviously longer than paraproct baculi, and slightly sinuate; proctiger absent; vagina broadened at the base and with many transverse wrinkles; vaginal plates well sclerotized, very narrow at bases though gradually broadened towards the apices; bursa copulatrix rather broad at the basal part, constricted at basal third, and again broadened in the apical part, which forms a doubled pouch, with a longitudinal furrow on the ante-basal part, into which enters the spermathecal duct; spermatheca strongly bent at apical third to which is attached the small gland, and gradually narrowed towards the base; spermathecal duct extremely short and thick.

***Amamiclytus subnitidus* HOLZSCHUH, 1984**

(Figs. 176–178)

Collecting data of the material used. Central Formosa, 1967.

Paraproct rather short, its baculi very thin, slightly sinuate; valvifer distinct, with thin and almost straight baculi; coxite baculi short, thin and sinuate; coxite lobes weakly sclerotized at each inner side; stylus moderate in size, and weakly sclerotized; dorsal baculi very thin, slightly sinuate, and obviously shorter than paraproct baculi;



Figs. 179–187. — 179–181, *Hayashicyltus acutivittis inscriptus*; 182–184, *Demonax transilis*; 185–187, *Paraclytus excultus*. Ovipositor, ventral view (179, 182, 185); ovipositor, dorsal view (180, 183, 186); internal reproductive organs (181, 184, 187). (Scale: 0.5 mm.)

proctiger absent; vaginal plates sclerotized though very thin filiform; bursa copulatrix small, weakly constricted at basal third; spermatheca weakly sclerotized, abruptly bent at apical third, and gradually narrowed towards the base, with the gland near the subapical bend; spermathecal duct irregularly coiled, and entering into the basal part of bursa copulatrix.

Notes. It is generally considered that the genus *Amamiclytus* is close to *Rhaphuma*. However, the result of comparison of the female genitalic features shows that there is no special similarity between these two genera.

***Hayashiclytus acutivittis inscriptus* (BATES, 1884)**

(Figs. 179–181)

Collecting data of the material used. Narutaki, Hinoemata-mura, Fukushima Pref., 23–VI–1984, S. SAITO leg.

Paraproct moderate in size, its baculi thick, bifurcate at the base, the inner branches being short and extending anteriorly, and the outer ones rectangularly extending to lateral sides; valvifer distinct, with thick and straight baculi; coxite baculi not clearly rod-like, disappearing anteriorly into converging folds; coxite lobes weakly sclerotized at each inner side; stylus moderate in size, rather heavily sclerotized except for the apex; dorsal baculi thin, slightly sinuate and a little shorter than paraproct baculi; proctiger baculi very thick, and slightly curved; vaginal plates filiform, sclerotized except for the apices; bursa copulatrix ovoid in apical two-thirds, strongly constricted at basal third and forming bursal duct; spermatheca weakly sclerotized, bent at apical third, and narrow at basal two-thirds; spermathecal duct short and thick, entering into the basal part of bursa copulatrix.

***Demonax transilis* BATES, 1884**

(Figs. 182–184)

Collecting data of the material used. Mt. Takao, Tokyo Met., 30–V–1971, H. KOBAYASHI leg.

Paraproct moderate in size, with thin and sinuate baculi; valvifer distinct, its baculi thin and almost straight; coxite baculi rather thick though short; coxite lobes rather broad, hardly sclerotized, and bearing rather long tactile hairs; stylus weakly sclerotized except for the apex; dorsal baculi thin, sinuate, and a little shorter than paraproct baculi; proctiger baculi thin and almost straight; vaginal plates straight, filiform, sclerotized except for the apices; bursa copulatrix rather small, broadened in apical part, narrowed towards the base; spermatheca extremely narrow, strongly curved as a whole, hardly sclerotized, and not clearly distinguishable from its duct, which is sinuate and enters into the vagina.

Tribe Anaglyptini

Paraclytus excultus BATES, 1884

(Figs. 185-187)

Collecting data of the material used. Ashio, Tochigi Pref., 29-V-1976, Y. NAGASHIMA leg.

Paraproct moderate in size, its baculi thick and slightly bisinuate; valvifer distinct, its baculi slightly curved, rather thick though thinned towards the apices; coxite baculi furcate at apical fourth, with shorter internal branches; coxite lobes rather broad, weakly sclerotized at each inner side, and with some tactile hairs; stylus moderate in size, and sclerotized except for apex; dorsal baculi weakly curved, and shorter than paraproct baculi; proctiger baculi short and straight; vaginal plates sinuate, thin at the bases though thickened towards the apices, and sclerotized in basal halves; bursa copulatrix large and sigmoidal, subglobular in basal part though narrower apically, constricted at the base; spermatheca narrow, strongly arcuate and tapering, with the gland attached to near the base of the outer side; spermathecal duct short, straight and entering into the base of bursa copulatrix.

Anaglyptus (Anaglyptus) matsushitai HAYASHI, 1955

(Figs. 188-190)

Collecting data of the material used. Near Masutomi, Sudama-chô, Yamanashi Pref., 13-VI-1987, R. INAGAWA leg.

Paraproct long, its baculi thick; valvifer distinct with rather long and almost straight baculi; coxite hardly constricted, with the baculi short and sharply bent inwards at the bases; coxite lobes short, with rather long tactile hairs; stylus moderate in size, sclerotized except for the apex, and bearing some long tactile hairs; dorsal baculi almost straight and somewhat shorter than paraproct baculi; proctiger baculi thin, short, and almost straight; vaginal plates sclerotized and acuminate; bursa copulatrix oval in apical half, narrow in basal half, with narrow longitudinal sclerotization; spermatheca curved and almost of the same width in apical two-thirds, with the gland fairly long and attached to the basal third of the outer side of spermatheca; spermathecal duct very short, rather thick, sinuate, and entering into bursa copulatrix at its basal third.

Oligoenoplus rosti rosti (PIC, 1911)

(Figs. 191-193)

Collecting data of the material used. Yunohana, Tateiwa-mura, Fukushima Pref., VI-1983, H. MAKIHARA leg.

Paraproct moderate in size, with thin and slightly sinuate baculi; valvifer distinct,

with almost straight baculi; coxite baculi rather thick though simple; coxite lobes hardly sclerotized, with rather long tactile hairs; stylus moderate in size, sclerotized except for the apex; dorsal baculi thin, a little shorter than paraproct baculi; proctiger baculi rather thick, almost straight; vaginal plates sclerotized and filiform; bursa copulatrix broad throughout; spermatheca narrow, curved, and weakly sclerotized; spermathecal duct short and thick, linearly sclerotized at the apex, and entering into the basal part of bursa copulatrix.

Notes. In *Anaglyptus (Akajimatora) bellus bellus* MATSUMURA et MATSUSHITA, 1933, general conformation of the female genitalia is similar to that of this species, with linear sclerotization at the apex of spermathecal duct, though the sclerotization is weaker than in this species. Because of this characteristic feature, *A. bellus bellus* is closer to this species than to *A. (Anaglyptus) matsushitai*. *Hirticlytus comosus* (MATSUSHITA, 1941) is also similar to this species in the feature of the female genitalia, but its spermathecal duct is not sclerotized.

Tribe Purpuricenini

Purpuricenus (Sternoplistes) spectabilis MOTSCHULSKY, 1857

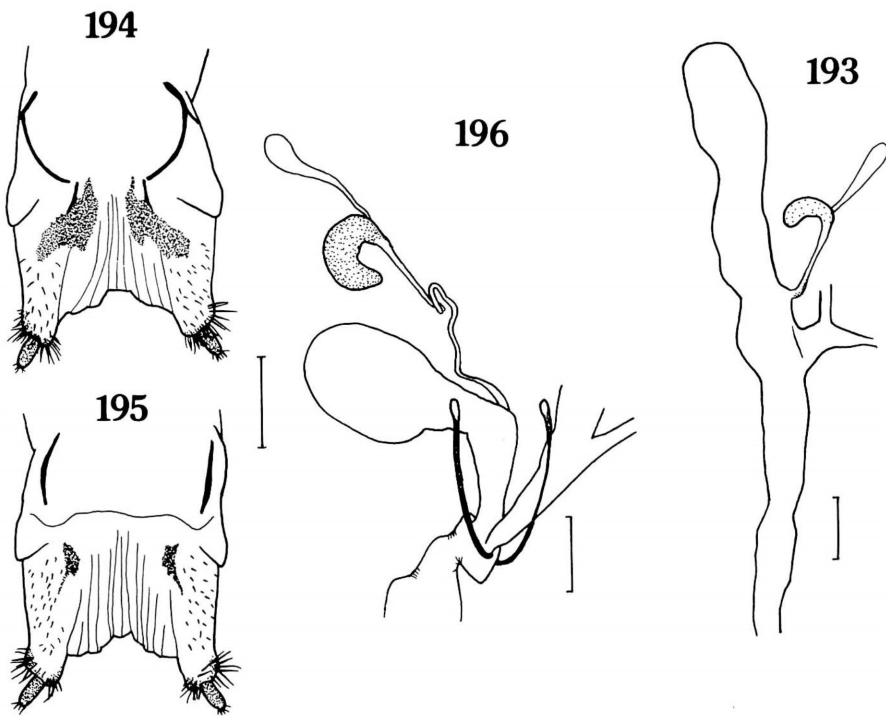
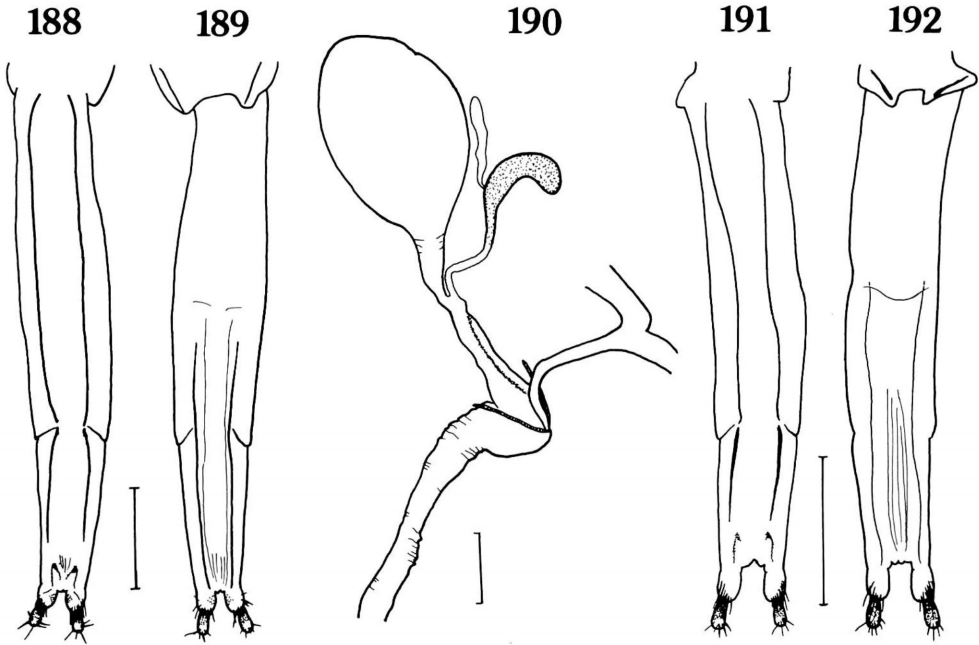
(Figs. 194–196)

Collecting data of the material used. Tobira, Nagano Pref., 18–VII–1969, H. KOBAYASHI leg.

Paraproct extremely short and broad, its baculi thick, curved, bifurcate at basal fourth; valvifer indistinct; coxite very short and broad, wholly pubescent, its baculi forming widely sclerotized parts, and rod-like only at their anterior external portions; coxite lobes weakly sclerotized, with many rather long tactile hairs; stylus narrow, sclerotized except for the apex; dorsal baculi very short, not rod-like but forming irregular sclerotized patches; proctiger baculi very thick, slightly curved; vaginal plates narrow and extremely long, gently curved, and heavily sclerotized except for the apices; bursa copulatrix ovoid in apical half, slightly constricted at the middle, and gradually narrowed towards the base; spermatheca abruptly bent at middle, its basal part very narrow; spermathecal duct coiled once before the middle, sinuate, and entering into the basal part of bursa copulatrix.

Notes. In *Purpuricenus (Sternoplistes) lituratus* GANGLBAUER, 1886, and *Amarysius sanguinipennis* (BLESSIG, 1872), the female genitalia are also peculiar in conformation as in this species.

Figs. 188–196. — 188–190, *Anaglyptus (Anaglyptus) matsushitai*; 191–193, *Oligoenoplus rosti rosti*; 194–196, *Purpuricenus (Sternoplistes) spectabilis*. Ovipositor, ventral view (188, 191, 194); ovipositor, dorsal view (189, 192, 195); internal reproductive organs (190, 193, 196). (Scale: 0.5 mm.)



Tribe Cleomenini

Kuraru rhopalophoroides HAYASHI, 1951

(Figs. 197–199)

Collecting data of the material used. Mt. Kasuga, Nara Pref., 23–IV–1979, A. SEKI leg.

Paraproct rather short, with thin and almost straight baculi; valvifer indistinct; coxite baculi slightly curved, and connected with paraproct baculi at each base; coxite lobes rather long, sclerotized at each inner side; stylus rather heavily sclerotized except for the apex; dorsal baculi a little longer than paraproct baculi and slightly sinuate; proctiger baculi thin and inwardly bent at apical third; vaginal plates not detected; bursa copulatrix not ovoid, rather narrow throughout; spermatheca narrow, strongly arcuate, and rectangularly bent near the base; spermathecal duct thin, coiled once at the base, sinuate, rectangularly bent before the apical portion, which is stiff, and entering into the basal part of bursa copulatrix.

Artimpaza setigera setigera (PIC, 1928)

(Figs. 200–202)

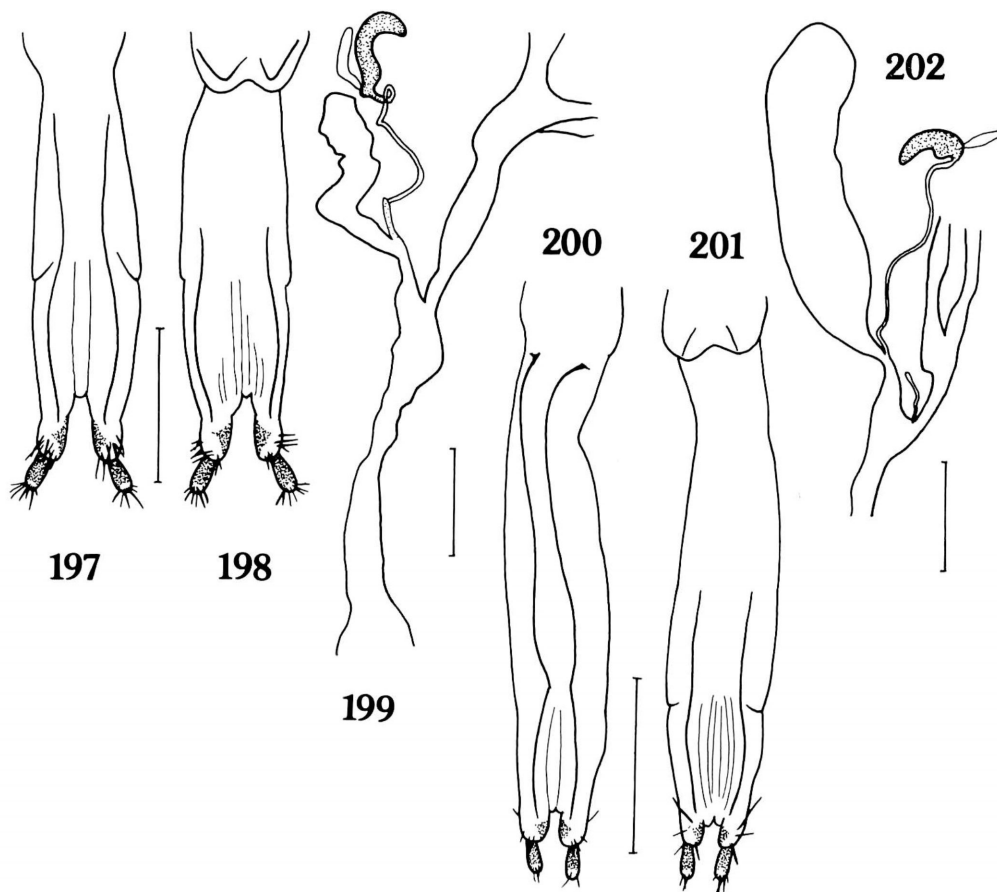
Collecting data of the material used. Musha, Taiwan, V–1942, T. SHINORA leg.

Paraproct rather long, its baculi thin and sinuate, though somewhat thickened at each base; valvifer indistinct; coxite hardly constricted, its baculi thin, slightly curved, and connected with paraproct baculi at each base; coxite lobes rather narrow, moderately sclerotized at each inner side; stylus moderate in size, sclerotized except for the apex; dorsal baculi thin and sinuate, obviously shorter than paraproct baculi; proctiger baculi short, thin and straight; vaginal plates very narrow and sinuate; bursa copulatrix long and broad, though narrow at basal fourth; spermatheca bent near the base, inwardly broadened in basal half, and narrowed in apical half; spermathecal duct long, thin, sinuate, and entering into the base of bursa copulatrix.

Discussion [Cerambycinae]

Since the time of THOMSON (1860–'61) and LACORDAIRE (1869), higher classification in the subfamily Cerambycinae has not been much changed. It is true that minor re-arrangement has been made from time to time, and certain groups, like disteniines, asemines and, of course, lepturines, have been removed from the subfamily. However, phylogenetic scrutiny of remaining tribes and genera has seldom been made, probably because of difficulty in arranging them in a convincing order. On the other hand, many new species have been added to the subfamily as recognition of species is usually not difficult, which makes the phylogenetic analysis more and more difficult.

In the latest monograph of the Japanese Cerambycidae, NIISATO (1992 a) classified the Japanese species of the subfamily Cerambycinae into 68 genera of 18 tribes.



Figs. 197–202. — 197–199, *Kurarua rhopalophoroides*; 200–202, *Artimpaza setigera setigera*.
Ovipositor, ventral view (197, 200); ovipositor, dorsal view (198, 201); internal reproductive
organs (199, 202). (Scale: 0.5 mm.)

His arrangement of the tribes is as follows: Cerambycini – Methiini – Hesperophanini – Achrysonini – Phoracanthini – Callidiopini – Oabriini – Stenopterini – Molorchini – Cleomenini – Thraniini – Pyrestini – Rosaliini – Callichromini – Purpuricenini – Callidiini – Clytini – Anaglyptini. These tribes are about the same as those recognized by HAYASHI (1983) in his check-list, though NISATO placed *Comusia* in the tribe Oabriini and *Merionoeda* in the Stenopterini. Besides, he arranged the Cleomenini at the side of the Molorchini and Purpuricenini next to the Callichromini.

My own study of the female genitalia reached a result somewhat different from those given by HAYASHI and NISATO. In many cases, these organs are not useful for classifying cerambycine tribes and genera, but sometimes, they are strikingly modified and furnish fundamental characters for phylogenetic study. The features that are

worth noting are as summarized below.

a) Cerambycini, Methiini, Hesperophanini, Phoracanthini and Callidiopini

No characteristics indicating diagnostic tribal features are found in the female genitalia of the species belonging to these tribes, though some features are species specific; in *Massicus raddei* (Cerambycini), all the baculi are very thick and the coxite lobes are very broad; in *Xystrocera globosa* (Methiini), the spermatheca is divided at the apical part and not sclerotized, and the bursa copulatrix bears distinctly defined duct; in *Leptoxenus ibidiiformis* (Methiini), the bursa copulatrix is unusually small; the problem of the taxonomic position of the genus *Comusia*, which was tentatively placed in the tribe Methiini in the second part of this series, will be taken up under the Oabriini; in *Gnatholea eburifera* (Hesperophanini), the paraproct baculi are composed of two pairs, a peculiarity that does not appear in any other cerambycines at all; in *Stenodryas clavigera clavigera* (Phoracanthini), the paraproct is extremely short and the proctiger is absent.

b) Thraniini, Rosaliini, Callichromini, Callidiini, Cleomenini

In the Thraniini, though only one species is examined, the paraproct baculi and coxite baculi are clearly connected with each other, and the coxite is not constricted at the base; in the two species of the Rosaliini, *Rosalia (Rosalia) batesi* and *Acrocyrtidus elegantulus longicornis*, the coxite is narrow but the coxite lobes are broad; in the four species of the two genera of the Callichromini, the base of the bursa copulatrix, into which the spermathecal duct enters, is either hollowed or provided with many grooves; in the Callidiini, the paraproct is rather long in most species, the proctiger tends to reduce or disappears, and the sclerotization of the spermatheca is rather weak; in the Cleomenini, the valvifer is absent. Though the genus *Kurarua* was originally erected as a member of the Molorchini, *K. rhopalophoroides* has normally developed proctiger and seems to have no direct affinity to the Molorchini, in which the proctiger is always absent.

c) Molorchini

In all the species belonging to this tribe, the proctiger is absent, and the vaginal plates are sclerotized. NISATO (1992 a) regarded the genus *Merionoeda*, which had been currently placed in the Molorchini by many Japanese specialists, as a member of the Stenopterini. This view is supported by the conformation of its female genitalia. *Merionoeda* is closer to the Stenopterini or Oabriini than to the Molorchini, though I cannot say whether or not the genus is really a member of the Stenopterini.

In any case, there is no similarity between the Molorchini and the Stenopterini or Oabriini.

d) Clytini, Anaglyptini

The Clytini is composed of many genera and species, though no diversification can be observed in the conformation of their female genitalia, and no direct affinity can be detected between the Clytini and Anaglyptini so far as concerned with these organs.

e) Pyrestini, Purpuricenini

Close similarity of these tribes has not been clearly recognized before, though they were placed side by side by GRESSITT (1951) in his monograph of the Chinese Cerambycidae. In reality, they are closely related to each other so far as concerned with the female genitalia, especially in the following points: the 8th abdominal segment bears many long bristles, the paraproct is very short, and the coxite is also short and bears long tactile hairs. These similarities seem to suggest a high probability that the two tribes belong to the same lineage.

f) Obriini, Stenopterini

The cerambycines belonging to these tribes are very peculiar in the conformation of their female genitalia. In all the species excluding *Obrium nakanei* and the species of *Ibidionidum*, the 4th abdominal sternite (2nd visible sternite) is distinctly emarginate and bears numerous long modified bristles along the posterior edge, some of which undergo sensilla-like modification, and the 5th and 6th segments are also shortened. The paraproct, valvifer and coxite are fused together in many species and completely devoid of their baculi, both the coxite and styli bear long tactile hairs, and the proctiger is always absent. The spermatheca is heavily sclerotized, and the spermathecal duct is long and thin, sometimes coiled many times. In the genus *Obrium*, both the paraproct and coxite considerably vary in length, sometimes even between two species whose external morphology is closely similar to each other in the adult.

The tribe Stenopterini is usually distinguished from the Obriini by shortening or tapering of the elytra, but I cannot find any genitalic characters that distinguish the former from the latter.

Conclusion

Though fairly diverse, the female genitalia are generally not useful for determining affinity or disparity of cerambycine tribes and genera. Even the Clytini, a large, homologous and externally isolated group, does not show any genitalic peculiarity distinguishing it from many other cerambycine tribes. As regards the Methiini, CROWSON (1955, p. 149) noted its partial resemblance to the Lamiinae, but so far as concerned with the Japanese species, *Xystrocera globosa* and *Leptoxenus ibidiiformis*, the female genitalia are fundamentally identical with those of other non-specialized groups of the Cerambycinae, and show no direct relationship to those of the Lamiinae. On the other hand, *Comusia* belongs to the obriine stock, not belonging to the Methiini. This was already pointed out by MARTINS (1977, pp. 112, 114) and followed by NII-SATO (1992 a, p. 482), and the present study also reached the same result (SAITO, 1991, pp. 167–168).

There are, however, some tribes in which the female genitalia are highly modified and show remarkable specialization. In the Molorchini, for instance, the proctiger is always absent, though the other parts are not much modified. The same feature is also found in certain species of the Callidiini and Clytini. On the other hand, *Merionoeda*, which was previously placed in the Molorchini, does not belong to this tribe

but is closer to the Obriini. Though NISATO (1992 a, p. 448) treated it as a member of the Stenopterini, it is difficult to determine from my study of the female genitalia to which tribe *Merionoeda* really belongs.

As was pointed out before, the two tribes, Pyrestini and Purpuricerini, are highly specialized and closely related to each other as viewed from the morphology of female genitalia. More striking is the Obriini, which must be the most specialized of the Japanese longicorn beetles belonging to the Cerambycinae. It is not only remarkable in the unique modification of ovipositor but also in that of the abdominal sternites.

要 約

斉藤明子：日本および近隣地域に産するカミキリムシ類の雌生殖器。II-IV。アオスジカミキリ族からホタルカミキリ族まで。——日本とその近隣地域に分布するカミキリムシ類のうち、カミキリ亜科に含まれる属の代表的な種を選んで、雌生殖器を精査した。その結果から導かれた、いくつかの種群についての類縁関係や分類学的地位に関する見解をまとめた。

カミキリ亜科に含まれる種では、外部形態の多様化にもかかわらず、雌生殖器の構造は全体に同質的であり、その形態は、族や属の類縁関係を知るために有効でない場合が多い。しかし、いくつかの種群では腹部第9節に顕著な変形が認められ、類縁関係を知る手がかりとなっている。

オガサワラチャイロカミキリ属は、最近になってアオスジカミキリ族からアメイロカミキリ族に移され、後者の一員として扱われることが多いが、雌生殖器の構造からみても、この処置を支持する結果が得られた。

NISATO (1992 a) は、モモプトコバナカミキリ属を、ヒゲナガコバナカミキリ族のものではなく、モモプトコバナカミキリ族の1属として扱っているが、雌生殖器の構造からみても、この属とヒゲナガコバナカミキリ族とは類縁的に大きく離れたものだろうと考えられる。アメイロカミキリ族とモモプトコバナカミキリ族では、腹部第9節が短縮し棒状片 (baculi) を欠くなど、共通したいちじるしい特異性を多くの種が示している。したがって、これら2族の類縁関係が近いことは確実である。しかし、モモプトコバナカミキリ属が、アメイロカミキリ族とモモプトコバナカミキリ族のいずれに含まれるべきであるかはわからない。

クスベニカミキリ族とベニカミキリ族でも、腹部第9節が短縮するという特異性がいちじるしく、類縁関係に近いものと考えられる。

Additional References

[Those given at the end of Part I are omitted.]

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Elytra, Tokyo, **21** (1): 25, May 15, 1993

Occurrence *Philonthus discoideus* GRAVENHORST (Coleoptera, Staphylinidae) on Torishima of the Izu Islands

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Recently, I had an opportunity to re-examine a species of staphylinid beetle obtained on Torishima Island previously recorded as *Philonthus* sp. (WATANABE, 1963, p. 172, pl. 3, fig. 17). It was found that this species agrees with *Philonthus discoideus* GRAVENHORST widely distributed in Japan except Hokkaido. Its collecting data are as given below.

1 ♂, Torishima Is. of the Izu Isls., Japan, 14-VII-1961, Y. WATANABE leg.

Reference

- WATANABE, Y., 1963. The insect fauna of Torishima. *Meteorological data and report of Marcus and Torishima Islands*, pp. 169-174, pl. 3.