

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

### II. Methiini through Callidiopini

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**Abstract** Sixteen species of cerambycine longicorn beetles are examined for their female reproductive organs. They represent 15 genera of 5 tribes (Methiini through Callidiopini). Though diverse, they are fundamentally similar to one another, with the exception of *Comusia testacea*.

In the second part of this series of papers, five tribes of the subfamily Cerambycinae will be taken up. Three genera each of the tribes Methiini, Hesperophanini and Cerambycini, 2 subgenera of *Allotraeus* of the Phoracanthini, and 5 genera of the Callidiopini are examined for their female reproductive organs. They will be described and illustrated.

The arrangement of the tribes and genera mainly follows that adopted by KUSAMA and TAKAKUWA (1984), though there are certain genera whose true affinity can be disputed. For instance, *Comusia*, currently placed in the Methiini, is considerably different from other genera of the tribe. Such cases will be critically examined in the "Discussion" to be given at the end of the Cerambycinae section.

### Results

#### Subfamily Cerambycinae

#### Tribe Methiini

#### *Comusia testacea* (GRESSITT, 1937)

(Figs. 37–39)

*Collecting data of the material used.* Chichijima Is., Ogasawara Isls., Tokyo Met., 15–VI–1989 (emerged 22–VII–1990), T. ITOH leg.; Hahajima Is., Ogasawara Isls., Tokyo Met., 7–VII–1986 (emerged VII–1987), H. MAKIHARA leg.

Paraproct very short and without baculum; valvifer indistinct; coxite clearly distinguished from paraproct, not constricted and without baculum; coxite lobes rather long, narrowed towards the apices, hardly sclerotized, with many tactile hairs,

and clearly depressed at the inner lateral sides; stylus very narrow, hardly broadened towards the apex, weakly sclerotized except for the base, abaxially articulated to the lateral face of coxite lobe, though ventrally fused with the latter; dorsal baculum absent; proctiger absent so as to make the anus directly open at the dorsal base of paraproct; vaginal plates very narrow; bursa copulatrix extremely long, only the apical part being ovoid, the other part very narrow and forming a long bursal duct; spermatheca weakly sclerotized, weakly constricted at base; spermathecal duct rather broad and simple, entering into the basal part of bursa copulatrix.

*Notes.* Though currently placed in the tribe Methiini by Japanese specialists, the female genitalia of *Comusia testacea* are strikingly different from those of *Xystrocera globosa* and *Leptoxenus ibidiiformis*. The genus *Comusia* was already transferred by MARTINS (1977, pp. 112, 114) from the Methiini to the Oabriini, and the result of the present study strongly supports his view. This problem will be taken up again after the female genitalia of other oabriines are dealt with.

#### *Xystrocera globosa* (OLIVIER, 1795)

(Figs. 40–41)

*Collecting data of the material used.* Mt. Ohboshiyama, Mine-machi, Tsushima Is., Nagasaki Pref., 5–VII–1983, S. SAITO leg.

Paraproct rather long, its baculi thick and slightly curved; valvifer distinct with short baculi; coxite baculi curved at the middle and with sclerotized parts inwardly; coxite lobes rather long, sclerotized at each inner side and with tactile hairs; stylus sclerotized except for the apical part; dorsal baculi rather long, thin and sinuate; proctiger baculi thick and almost straight; vaginal plates very narrow; bursa copulatrix large, globular in apical half, well constricted at middle, and again gradually broadened towards the base; spermatheca not sclerotized, with the apical part divided into two lobes, one of which is rather long and the other short and pointed at the apex; spermathecal gland absent; spermathecal duct thin and simple, entering into the base of bursa copulatrix.

*Notes.* The female genitalia of *Xystrocera* are peculiar in the conformation of the spermatheca, which is not sclerotized and divided at the apical part. They are, however, otherwise ordinary.

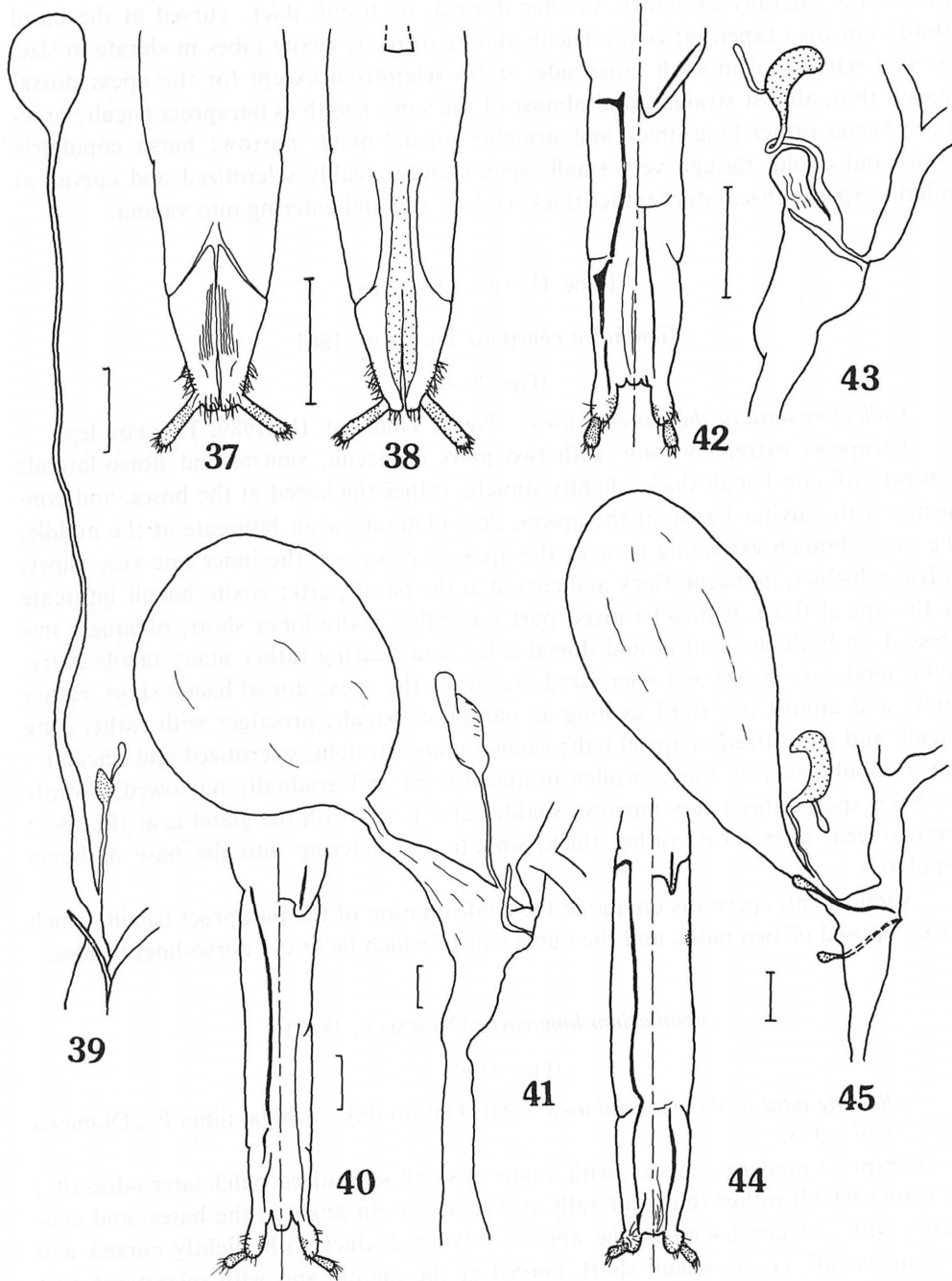
#### *Leptoxenus ibidiiformis* BATES, 1877

(Figs. 42–43)

*Collecting data of the material used.* Mt. Fukuchi, Fukuoka Pref., 24–V–1944, Y. YAMAWAKI leg.

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Figs. 37–45. Ovipositor (left half: ventral view; right half: dorsal view) and internal reproductive organ (ventral view). — 37–39, *Comusia testacea* — ventral view of ovipositor is shown in Fig. 1, dorsal view is shown in Fig. 2; 40–41, *Xystrocera globosa*; 42–43, *Leptoxenus ibidiiformis*; 44–45, *Stromatium longicorne*. (Scale: 0.5 mm.)



Paraproct short, its baculi thick, divided at the bases, the inner baculi short, the outer ones laterally extended; valvifer distinct, its baculi thick, curved at the basal third, and then tapering; coxite baculi almost straight; coxite lobes moderate in size, weakly sclerotized at each inner side; stylus sclerotized except for the apex; dorsal baculi thin, almost straight, and almost of the same length as paraproct baculi; proctiger baculi rather long, thick and straight; vaginal plates narrow; bursa copulatrix short and ovoid, though very small; spermatheca weakly sclerotized and curved at middle; spermathecal duct rather thick, coiled once and entering into vagina.

### Tribe Hesperophanini

#### *Gnatholea eburifera* THOMSON, 1861

(Figs. 46-48)

*Collecting data of the material used.* Ngao, Thailand, III-1989, T. IKEDA leg.

Paraproct extremely long, with two pairs of baculi, ventral and dorso-lateral; ventral ordinary baculi thick, slightly sinuate, rather thickened at the bases, and connected with valvifer baculi at the apices, dorso-lateral baculi bifurcate at the middle, the outer branch extending to near the apex of proctiger, the inner one very short; valvifer distinct, its baculi thick and curved at the basal parts; coxite baculi bifurcate at the apical third, with sclerotized part inwardly; coxite lobes short, obliquely impressed on both the ventral and dorsal sides, and bearing rather many tactile hairs; stylus moderate in size and sclerotized except for the apex; dorsal baculi short, rather thick, and almost one-third as long as paraproct baculi; proctiger with rather long baculi, and sclerotized in apical half; vaginal plates straight, sclerotized and aciculate; bursa copulatrix very long, swollen in apical third and gradually narrowed towards the base; spermatheca very narrow, weakly curved, and with the gland near the apex; spermathecal duct short, rather thick, sinuate and entering into the base of bursa copulatrix.

*Notes.* This species is unique in the conformation of the paraproct baculi, which are composed of two pairs, and the outer pair of which lie at the dorso-lateral sides.

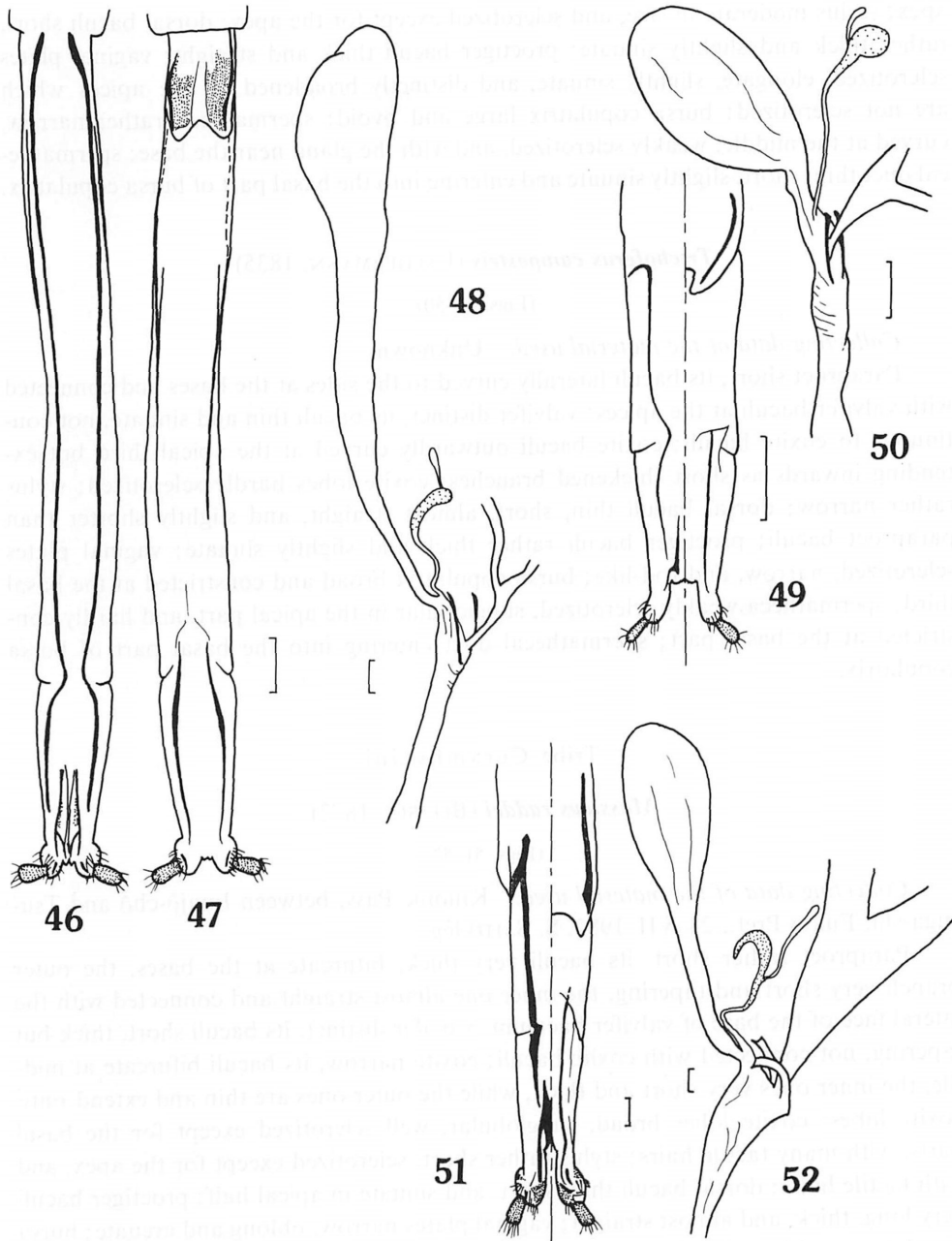
#### *Stromatium longicorne* (NEWMAN, 1842)

(Figs. 44-45)

*Collecting data of the material used.* Mt. Omoto-dake, Ishigakijima Is., Okinawa Pref., 31-V-1973.

Paraproct moderate in size, with a pair of small sclerotized patch latero-dorsally; paraproct baculi rather thick, laterally curved at a right angle at the bases, and connected with valvifer baculi at the apices; valvifer distinct with slightly curved and tapering baculi; coxite baculi short, curved at the middle and with sclerotized part inwardly; coxite lobes short, each with an impression on the ventral side near the





Figs. 46-52. Ovipositor (left half: ventral view; right half: dorsal view) and internal reproductive organ (ventral view). — 46-48, *Gnatholea eburifera* — ventral view of ovipositor is shown in Fig. 10, dorsal view in Fig. 11; 49-50, *Trichoferus campestris*; 51-52, *Massicus raddei*. (Scale: 0.5 mm.)

apex; stylus moderate in size, and sclerotized except for the apex; dorsal baculi short, rather thick and slightly sinuate; proctiger baculi thick and straight; vaginal plates sclerotized, elongate, slightly sinuate, and distinctly broadened at the apices which are not sclerotized; bursa copulatrix large and ovoid; spermatheca rather narrow, curved at the middle, weakly sclerotized, and with the gland near the base; spermathecal duct thin, short, slightly sinuate and entering into the basal part of bursa copulatrix.

*Trichoferus campestris* (FALDERMANN, 1835)

(Figs. 49–50)

*Collecting data of the material used.* Unknown.

Paraproct short, its baculi laterally curved to the sides at the bases and connected with valvifer baculi at the apices; valvifer distinct, its baculi thin and sinuate, not continuous to coxite baculi; coxite baculi outwardly curved at the apical third but extending inwards as short thickened branches; coxite lobes hardly sclerotized; stylus rather narrow; dorsal baculi thin, short, almost straight, and slightly shorter than paraproct baculi; proctiger baculi rather thick and slightly sinuate; vaginal plates sclerotized, narrow, and rod-like; bursa copulatrix broad and constricted at the basal third; spermatheca weakly sclerotized, subglobular in the apical part, and hardly constricted at the basal part; spermathecal duct entering into the basal part of bursa copulatrix.

Tribe Cerambycini

*Massicus raddei* (BLESSIG, 1872)

(Figs. 51–52)

*Collecting data of the material used.* Kinome Pass, between Imajô-chô and Tsuruga-shi, Fukui Pref., 28–VII–1982, S. SAITO leg.

Paraproct rather short, its baculi very thick, bifurcate at the bases, the outer branch very short and tapering, the inner one almost straight and connected with the lateral face of the base of valvifer baculum; valvifer distinct, its baculi short, thick but tapering, not connected with coxite baculi; coxite narrow, its baculi bifurcate at middle, the inner ones very short and thick, while the outer ones are thin and extend onto coxite lobes; coxite lobes broad, subglobular, well sclerotized except for the basal parts, with many tactile hairs; stylus rather short, sclerotized except for the apex, and with tactile hairs; dorsal baculi thin, short, and sinuate in apical half; proctiger baculi very long, thick, and almost straight; vaginal plates narrow, oblong and arcuate; bursa copulatrix oval in apical half, narrow in basal half; spermatheca narrow and curved, with narrowly protruding basal part to which attaches the spermathecal gland, its duct being sinuate and entering into the base of bursa copulatrix.

*Aeolesthes (Pseudaolesthes) chrysothrix chrysothrix* (BATES, 1873)

(Figs. 53-54)

*Collecting data of the material used.* Mt. Kohbohyama, Kanagawa Pref., 24-V-1981, T. MAENAMI leg.

Paraproct moderate in size, its baculi rather thick, bifurcate at the bases, the outer ones rather short but curved, the inner ones almost straight; valvifer distinct and broad, its baculi rather long, curved at the basal fourth, and not connected with coxite baculi, which are very short and thin; coxite lobes hardly constricted at the bases, weakly sclerotized at each inner side, and with many tactile hairs; stylus rather long, with tactile hairs at the apex; dorsal baculi thin, slightly sinuate, and shorter than paraproct baculi; proctiger baculi thin; vaginal plates extremely narrow though stiff; bursa copulatrix oval in apical half and narrowed at middle; spermatheca narrow, comma-shaped, not constricted at the base, and smoothly narrowed to the duct, which enters into the basal part of bursa copulatrix.

*Dymasius hirayamai* MATSUSHITA, 1941

(Figs. 55-56)

*Collecting data of the material used.* Jih-yueh-tan, Nantou Hsien, Taiwan, 14-V-1978, K. SASAKI leg.

Paraproct moderate in size, its baculi bifurcate at the bases, the outer branch being very short; valvifer distinct, with tapering baculi; coxite baculi very short and weakly sclerotized; coxite lobes narrow, hardly sclerotized, clearly distinguished from coxite, and with tactile hairs; stylus very narrow at base, sclerotized except for the apex, abaxially articulated to coxite lobe, and with tactile hairs; dorsal baculi thin, slightly sinuate, and shorter than paraproct baculi; proctiger baculi rather thick and almost straight; vaginal plates very narrow, rather long, sclerotized, and slightly sinuate; bursa copulatrix oval, though narrowed at the basal third; spermatheca narrow and curved, weakly swollen in basal half, its duct coiled twice and entering into the basal part of bursa copulatrix.

## Tribe Phoracanthini

*Allotraeus (Allotraeus) sphaerioninus* BATES, 1877

(Figs. 57-58)

*Collecting data of the material used.* Mt. Kobushidake, Nagano Pref., 4-VIII-1976, K. SASAKI leg.

Paraproct rather short, with thick baculi which form small sclerotized outer expansions extending to the lateral sides near the bases of paraproct; valvifer distinct, its baculi thick, curved, tapering, and not connected with coxite ones; coxite baculi

rather long and sinuate; coxite lobes hardly sclerotized, and with tactile hairs; stylus rather short; dorsal baculi straight, and almost as long as paraproct baculi; proctiger baculi rather thick; vaginal plates very long and narrow, sclerotized and needle-like; bursa copulatrix rather broad, narrowed towards the base; spermatheca weakly sclerotized, curved at middle, more or less broadened in basal half, with straight duct which enters into the basal part of bursa copulatrix.

*Allotraeus (Nysina) insularis amamiensis* HAYASHI, 1961

(Figs. 59–60)

*Collecting data of the material used.* Mt. Yonaha-dake, Okinawa Is., Okinawa Pref., 18–IV–1979, H. MAKIHARA leg.

Paraproct moderate in size, its baculi thick, slightly sinuate, outwardly with small sclerotized parts near the bases; valvifer distinct, its baculi curved at the basal third and tapering; coxite baculi curved at middle, the area inside each baculum being sclerotized; coxite lobes rather broad, hardly sclerotized, with oblique impressions near the bases of the ventral surface and at the middle of dorsum; stylus moderate in size, and sclerotized except for the apex; dorsal baculi thin, almost straight, and shorter than paraproct baculi; proctiger baculi thin and almost straight; vaginal plates long and very narrow, sclerotized, and distinctly curved at the bases; bursa copulatrix rather broad tubular and not constricted; spermatheca c-shaped, constricted at the base, and with the gland at the lateral face near the base; spermathecal duct rather short, slightly sinuate, and entering into the base of bursa copulatrix.

Tribe Callidiopini

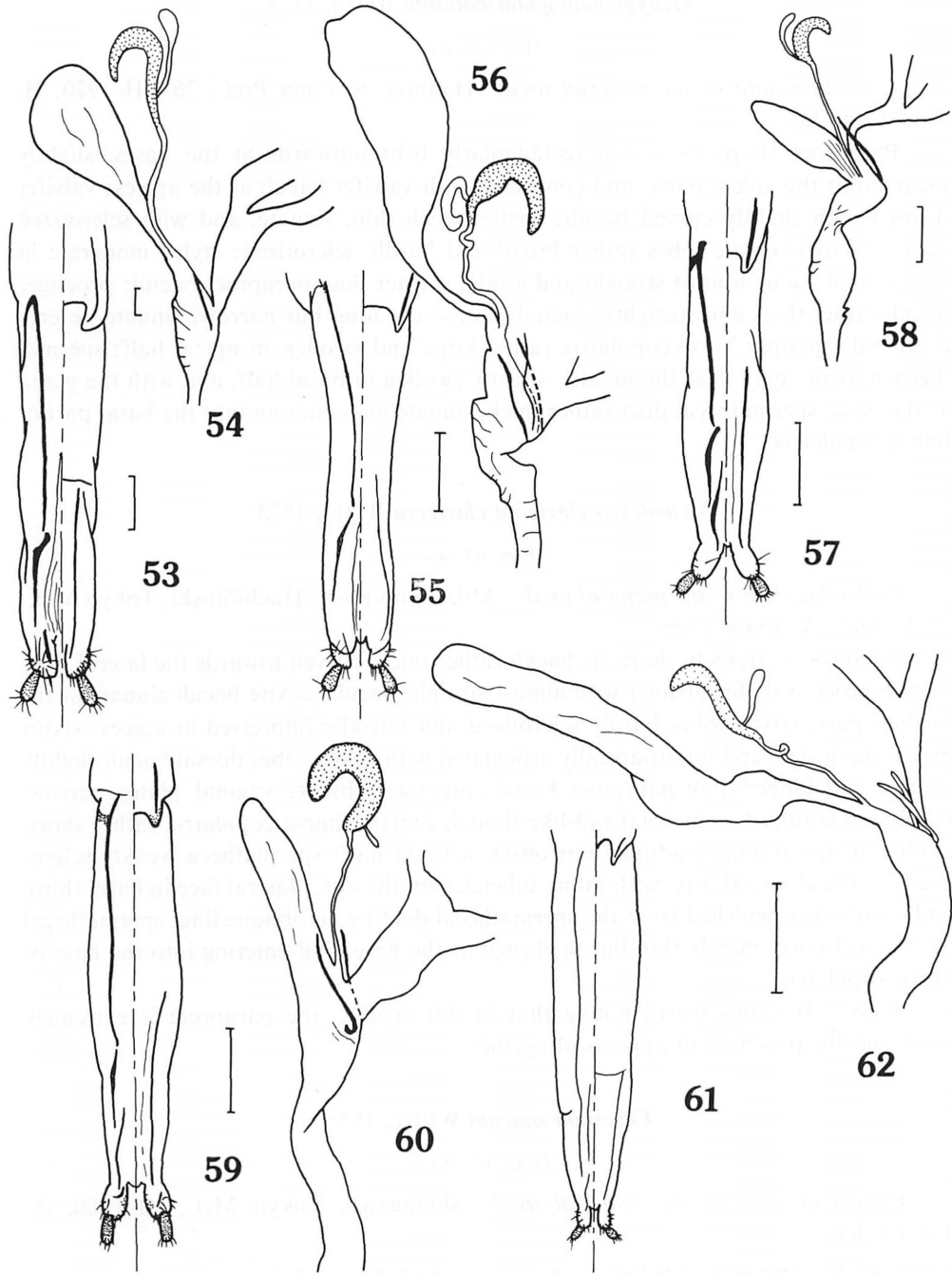
*Curtomerus flavus* (FABRICIUS, 1775)

(Figs. 61–62)

*Collecting data of the material used.* Hahajima Is., Ogasawara Is., Tokyo Met., 26–VI–1976, Y. KUROSAWA leg.

Paraproct rather long, its baculi thin, slightly sinuate and connected with valvifer baculi at the apices; valvifer distinct with thin and almost straight baculi; coxite baculi thin and sinuate; coxite lobes moderate in size and hardly sclerotized; stylus sclerotized except for the apex; dorsal baculi short, thin, almost straight and a half as long as paraproct baculi; proctiger baculi very short and thin; vaginal plates narrow and weakly sclerotized; bursa copulatrix very long, and constricted at basal fourth; spermatheca narrow, rather long, slightly sclerotized and with the gland near the base; spermathecal duct coiled once and entering into the base of bursa copulatrix.

Figs. 53–62. Ovipositor (left half: ventral view; right half: dorsal view) and internal reproductive organ (ventral view). — 53–54, *Aeolesthes (Pseudaeolesthes) chrysothrix chrysothrix*; 55–56, *Dymasius hirayamai*; 57–58, *Allotraeus (Allotraeus) sphaerioninus*; 59–60, *Allotraeus (Nysina) insularis amamiensis*; 61–62, *Curtomerus flavus*. (Scale: 0.5 mm.)



*Stenygrinum quadrinotatum* BATES, 1873

(Figs. 63–64)

*Collecting data of the material used.* Hannou, Saitama Pref., 26–VII–1970, H. KOBAYASHI leg.

Paraproct short, its baculi rectangularly bent outwards at the bases, slightly incurved at the apical parts, and connected with valvifer baculi at the apices; valvifer distinct with slightly curved baculi; coxite baculi thin, sinuate, and with sclerotized areas inwards; coxite lobes rather broad and hardly sclerotized; stylus moderate in size; dorsal baculi almost straight and a little shorter than paraproct baculi; proctiger baculi rather thick and straight; vaginal plates very long but narrow, sinuate, sclerotized and tapering; bursa copulatrix rather large and swollen in apical half; spermatheca narrow, curved at the middle, slightly swollen in basal half, and with the gland at the base; spermathecal duct rather thick, sinuate and entering into the basal part of bursa copulatrix.

*Stenodryas clavigera clavigera* BATES, 1873

(Figs. 65–66)

*Collecting data of the material used.* Mikoromo-reien, Hachiōji-shi, Tokyo Met., 19–V–1982, A. TAKASU leg.

Paraproct extremely short, its baculi rather thick, curved towards the lateral sides of paraproct; valvifer distinct with almost straight baculi; coxite baculi sinuate at the median part; coxite lobes hardly sclerotized and dorsally impressed at apices; stylus moderate in size, and latero-apically articulated with coxite lobe; dorsal baculi slightly sinuate and longer than paraproct baculi; proctiger absent; vaginal plates narrow, strongly sclerotized, somewhat rod-like though sinuate; bursa copulatrix rather short, swollen in apical half, gradually narrowed in basal half; spermatheca weakly sclerotized in apical two-thirds, with many tubercles on the outer lateral face in basal third, and clearly distinguished from the spermathecal duct by an oblique line; spermathecal duct coiled once, mostly thin but thickened at the base, and entering into the base of bursa copulatrix.

*Notes.* It seems worth noting that in this species, the paraproct is extremely short and the proctiger disappears altogether.

*Ceresium sinicum* WHITE, 1855

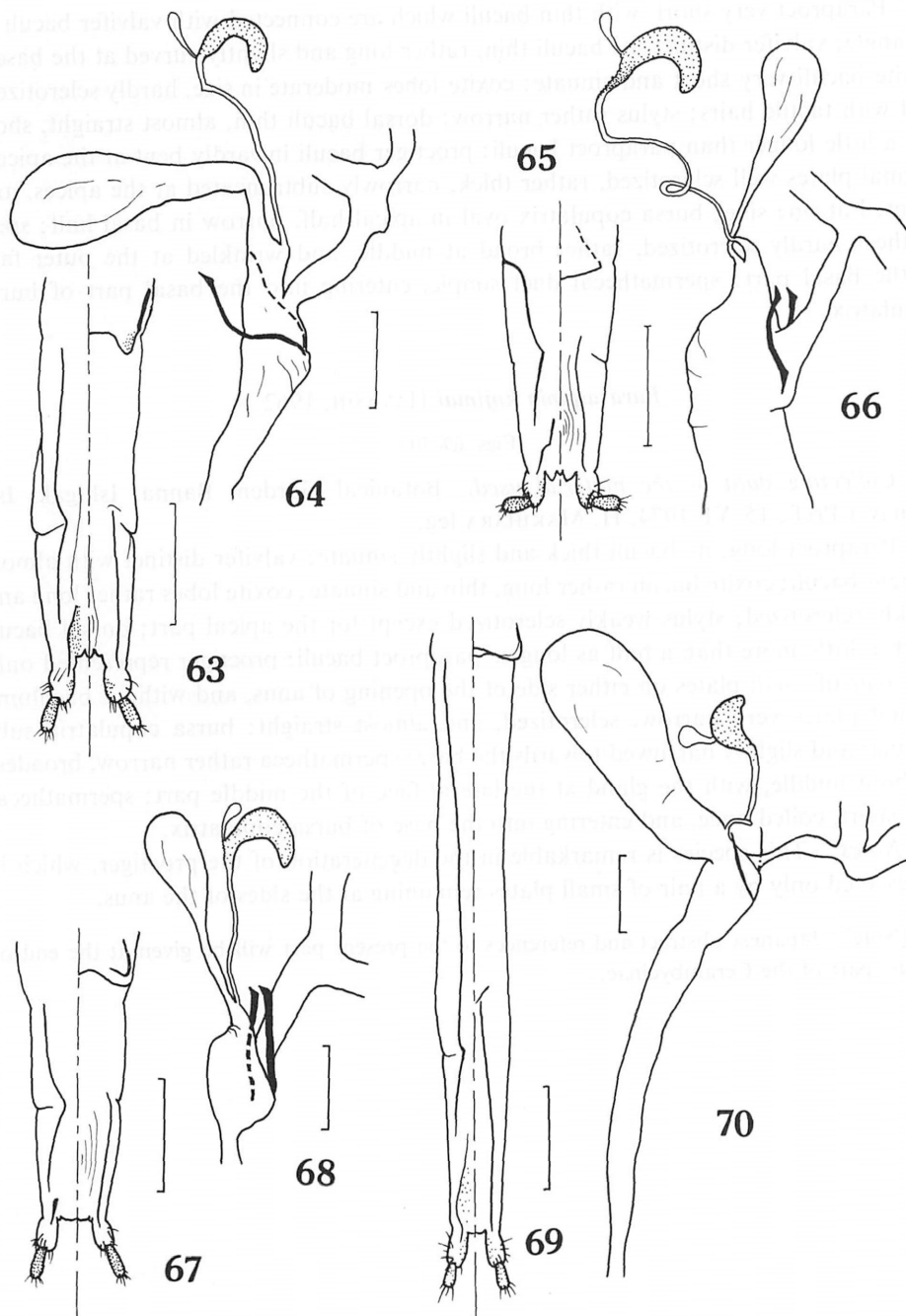
(Figs. 67–68)

*Collecting data of the material used.* Shinagawa, Tokyo Met., VI–1980, A. TAKASU leg.

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Figs. 63–70. Ovipositor (left half: ventral view; right half: dorsal view) and internal reproductive organ (ventral view). — 63–64, *Stenygrinum quadrinotatum*; 65–66, *Stenodryas clavigera clavigera*; 67–68, *Ceresium sinicum*; 69–70, *Parasalpinia kojimai*. (Scale: 0.5 mm.)





Paraproct very short, with thin baculi which are connected with valvifer baculi at an angle; valvifer distinct, its baculi thin, rather long and slightly curved at the bases; coxite baculi very short and sinuate; coxite lobes moderate in size, hardly sclerotized, and with tactile hairs; stylus rather narrow; dorsal baculi thin, almost straight, short but a little longer than paraproct baculi; proctiger baculi inwardly bent at the apices; vaginal plates well sclerotized, rather thick, narrowly subtruncated at the apices, and pointed at one side; bursa copulatrix oval in apical half, narrow in basal half; spermatheca hardly sclerotized, rather broad at middle, and wrinkled at the outer face of the basal part; spermathecal duct simple, entering into the basal part of bursa copulatrix.

*Parasalpinia kojimai* HAYASHI, 1962

(Figs. 69-70)

*Collecting data of the material used.* Botanical Garden, Banna, Ishigaki Is., Okinawa Pref., 15-VI-1974, H. MAKIHARA leg.

Paraproct long, its baculi thick and slightly sinuate; valvifer distinct with almost straight baculi; coxite baculi rather long, thin and sinuate; coxite lobes rather long and weakly sclerotized; stylus weakly sclerotized except for the apical part; dorsal baculi short, a little more than a half as long as paraproct baculi; proctiger represented only by a pair of small plates on either side of the opening of anus, and without baculum; vaginal plates very narrow, sclerotized, and almost straight; bursa copulatrix subglobular and slightly narrowed towards the base; spermatheca rather narrow, broadest at about middle, with the gland at the lateral face of the middle part; spermathecal duct short, coiled once, and entering into the base of bursa copulatrix.

*Notes.* This species is remarkable in the degeneration of the proctiger, which is represented only by a pair of small plates remaining at the sides of the anus.

[**Note**] Japanese abstract and references to the present part will be given at the end of the last part of the Cerambycinae.