

## Female terminalia of *Goneccalypsis lucida* and *Laphria nigrovittata* (Diptera, Asilidae)<sup>1,2</sup>

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### Abstract

The structure of the female terminalia of two species of Laphriinae is described and illustrated. They are *Goneccalypsis lucida* (belonging to the tribe Atomosiini) known from Taiwan and Iriomote I., and *Laphria nigrovittata* (the tribe Laphriini) from Japan (Hokkaido, Honshu, Shikoku and Kyushu).

Key words: Taxonomy and morphology, Robber fly, Taiwan, Iriomote I., Japan proper.

### Introduction

The female terminalia or ovipositor of Asilidae vary greatly in shape with tribe or subfamily. MELIN (1923) showed the ovipositor of 13 genera and 13 species belonging to Leptogastrinae (*Leptogaster*), Dasypogoninae s. lat. (*Dioctria*, *Lasiopogon*, *Cyrtopogon*), Laphriinae (*Laphria*), and Asilinae (*Philonicus*, *Pamponerus*, *Asilus*, *Rhadiurgus*, *Dysmachus*, *Eutolmus*, *Machimus* and *Neoitamus*). THEODOR (1976, 1980) published a fine monograph on the genitalia of Asilidae and showed the spermatheca and genital fork admirably in numerous genera and species.

NAGATOMI (1983a, b, 1984), and NAGATOMI et al. (in press) described and illustrated the female terminalia (excluding spermatheca) of *Holopogon* (1 species), *Stichopogon* (2 spp.), *Scylaticus* (3 spp.), and *Molobratia* (4 spp.), all of which

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belong to the subfamily Dasypogoninae s. lat. This paper deals with the female terminalia (excluding spermatheca) of *Goneccalypsis* (1 species) and *Laphria* (1 sp.), belonging to the subfamily Laphriinae.

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### *Goneccalypsis lucida* HERMANN

(Figs. 1-6)

*Goneccalypsis lucida* NERMANN, 1912, Nova Acta Leop.-Carol. Akad. Naturf., 96 : 110. Type locality: Formosa.

*Goneccalypsis* belongs to the tribe Atomosiini. *G. lucida* was redescribed and illustrated by NAGATOMI and IMAIZUMI (1987) on the basis of material from Iriomote I., Japan, but the female terminalia were not treated.

THEODOR (1976) illustrated the spermatheca of *Atomosia puella*, *Atoniomyia viduata*, and *Cerotainia macrocera*, all of which belong to Atomosiini.

Female terminalia (Figs. 1-6): The following description is based upon only one species and no specific character is extracted. Abdominal dorsum arched and strongly sclerotized but venter more or less membranous; segment 6 about as wide as segment 5; segment 7 narrower than segment 6; segment 8 much reduced in size and never protruded beyond segment 7; tergum 7 rounded in posterior margin; tergum 8 trapezoid, much wider than long, and with strong hairs at posterior margin (except middle) and lateral margin (except anterior part); sternum 8 trapezoid, wider than long, more or less concave at anterior margin, with strong hairs except middle and anterior portions, with a pair of stout hairs at inner part of posterior margin, and narrower than tergum 8; tergum 9 + 10 very small, rectangular, much wider than long and without hairs; sternum 10 strongly concave at middle of posterior margin, more strongly sclerotized at postero-lateral portions and with strong hairs except middle and anterior parts; a pair of cerci widely separated and each cercus may be rounded at inner posterior portion and with strong hairs; genital fork rather rectangular except for rounded anterior portion, longer than wide, strongly sclerotized only at each lateral margin.

Specimens dissected (5 ♀♀): 2 ♀♀, Komi, Iriomote I. (Japan: Yaeyama Is.), 2. v. 1976, A. NAGATOMI; 3 ♀♀, Komi, Iriomote I., 30. iv.-1. v. 1982, A. NAGATOMI.



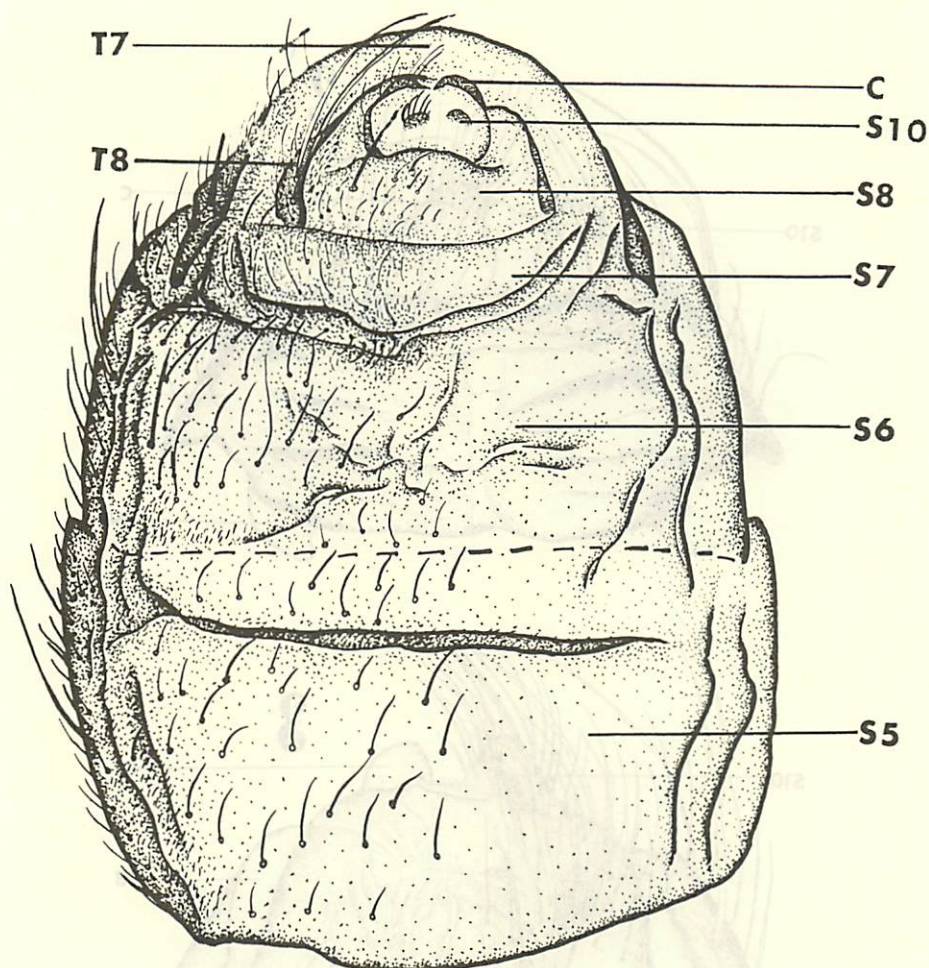


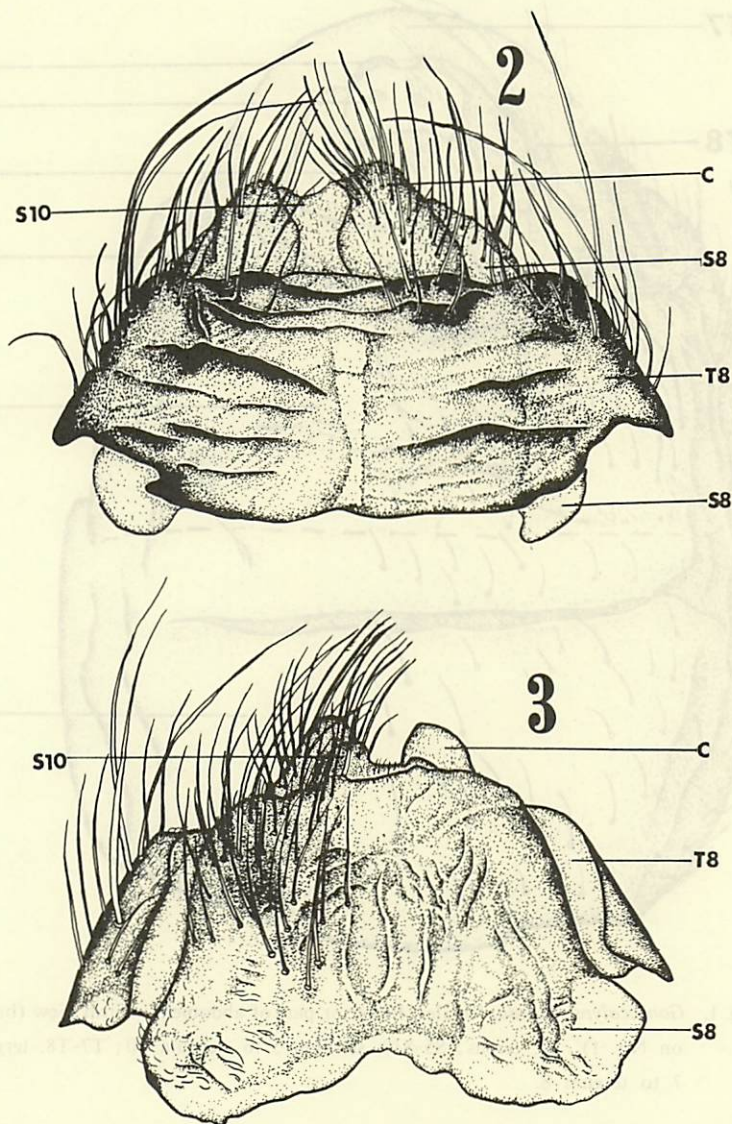
Fig. 1. *Goneccalypsis lucida*, female. Posterior part of abdomen, ventral view (based on No. 1). C, cercus; S5-S10, sternum 5 to sternum 10; T7-T8, tergum 7 to tergum 8.

Japanese name: Hachigata-ko-mushihiki.

Biology: No knowledge of biology is gained in this species.

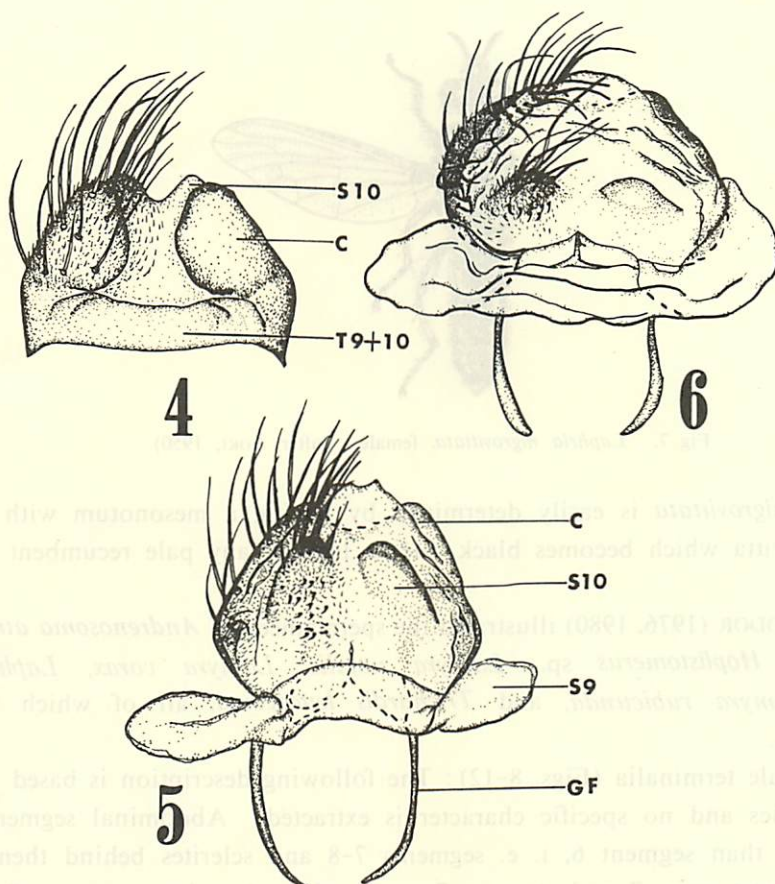
HULL (1962: 369) wrote as to *Atomosiini*, "Larval habits are unknown." The adults of *G. lucida* collected were resting on the foliage in shadowy woods.

Distribution. Taiwan, and Iriomote I. (Japan: Yaeyama Is.).



Figs. 2-3. *Goneccalypsis lucida*, female. Segment 8 and cerci, dorsal and ventral views (based on No. 2). C, cercus; S8-S10, sternum 8 to sternum 10; T8, tergum 8.





Figs. 4-6. *Goneccalypsis lucida*, female. Tergum 9 + 10, sternum 9, sternum 10, cerci and genital fork (based on No. 3). 4, Dorsal view; 5, ventral view (genital fork is kept nearly horizontal); 6, posterior view (showing variation according to angle). C, cercus; GF, genital fork; S9-S10, sternum 9 to sternum 10; T9 + 10, tergum 9 + 10.

### *Laphria nigrovittata* MATSUMURA

(Figs. 7-12)

*Laphria nigrovittata* MATSUMURA, 1916, Thous. Ins. Jap. Addit., 2: 318.

Type locality: Japan (Sapporo).

*Laphria* belongs to the tribe Laphriini. *L. nigrovittata* was redescribed and illustrated by AOKI (1950) and HISAMATSU (1965), but the male and female genitalia were not examined. The members of *Laphria* are very similar to one another,



Fig. 7. *Laphria nigrovittata*, female. (after AOKI, 1950).

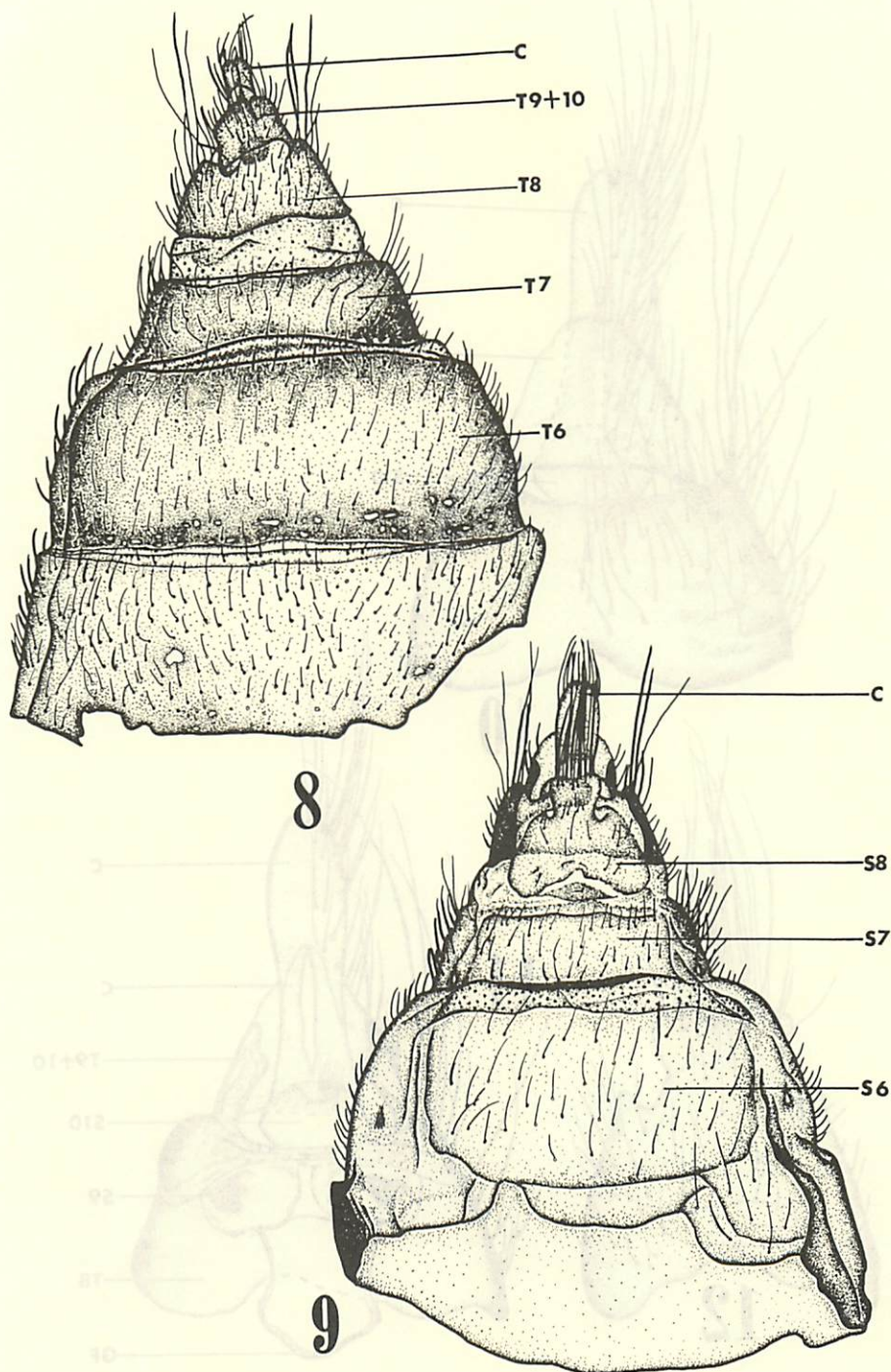
but *L. nigrovittata* is easily determined by having a mesonotum with a distinct median vitta which becomes black due to lack of any pale recumbent dense pile (Fig. 7).

THEODOR (1976, 1980) illustrated the spermatheca of *Andrenosoma atra*, *Ctenota molitrix*, *Hoplistomerus* sp., *Lamyra nobilis*, *Lamyra vorax*, *Laphria flava*, *Stiphrolamyra rubicunda*, and *Trichardis leucocoma*, all of which belong to Laphriini.

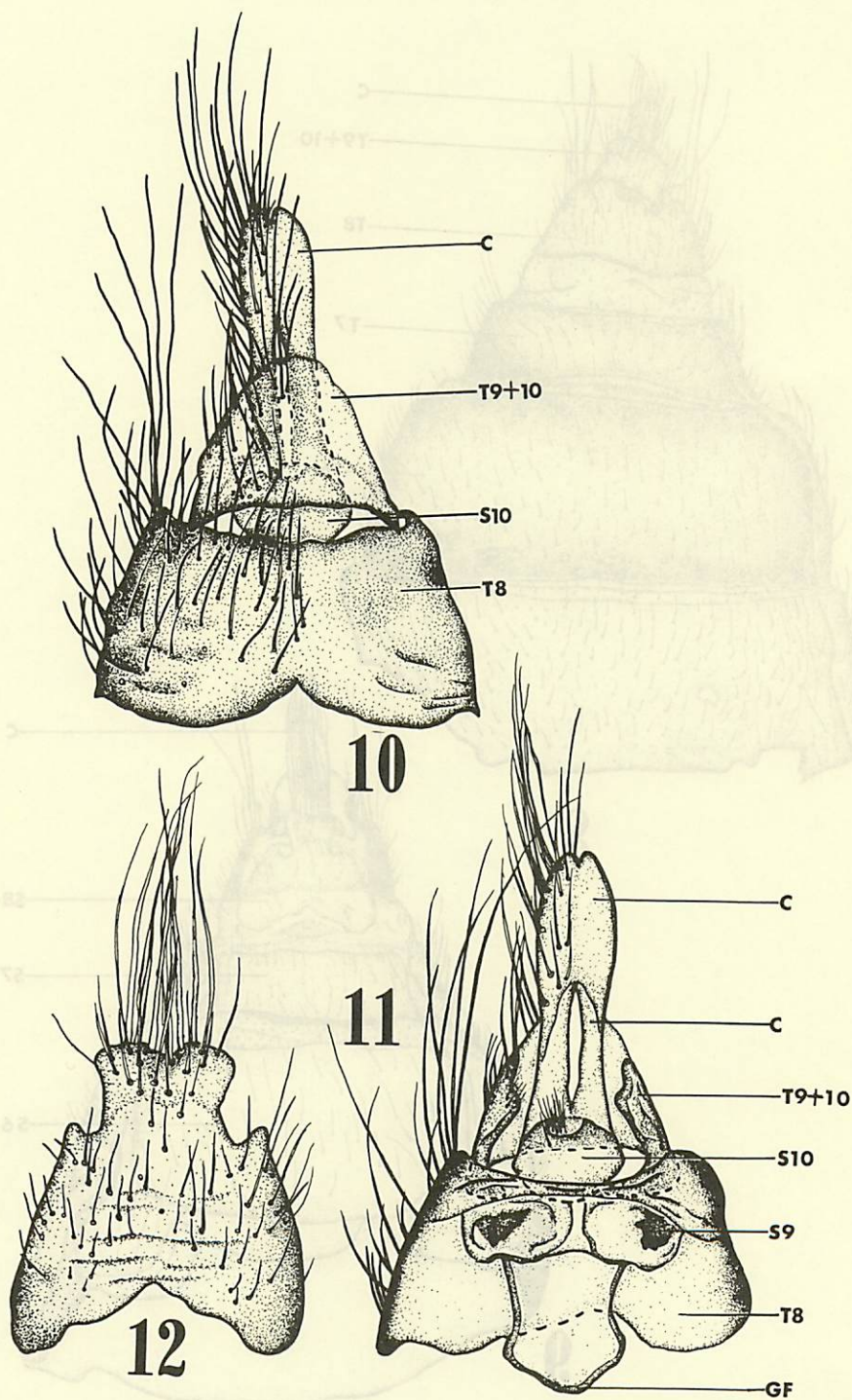
Female terminalia (Figs. 8-12): The following description is based upon only one species and no specific character is extracted. Abdominal segment 7 much narrower than segment 6, i. e. segments 7-8 and sclerites behind them form an ovipositor; tergum 7 and sternum 7 much wider than long; tergum 8 trapezoid, much wider than long, with hairs which become conspicuously long on posterolateral parts. Sternum 8 consists of a larger anterior trapezoid part and a smaller posterior rectangular part; the former concave at anterior margin, protruded to some degree at posterolateral corner, and with hairs except anterior part; the latter wider than long, with triangular haired area which points anteriorly; posterior margin of sternum 8 with strong hairs which are somewhat longer than sternum 8 at midline. Tergum 9 + 10 semicircular or rather triangular in shape, with lateral parts (except posterior portions) folded ventrally, and with fine hairs; sternum 10 small, elliptical or pentagonal, wider than long and with a midposterior patch which is desclerotized and densely covered with short hairs; cerci fused at posterior portion, much longer than tergum 9 + 10, rounded posteriorly, with a shallow mid concavity at apex, and with long hairs at posterolateral borders. Genital fork longer than wide, sclerotized only at lateral and anterior margins, which form U-shape.

Specimens dissected (4 ♀♀): 1 ♀, Nukabira, Hokkaido, 19. vii. 1964, A. NAGATOMI; 1 ♀, Kamikochi, Nagano Pref., 9. vii. 1963, A. NAGATOMI; 1 ♀, Gokanoshō, Kumamoto Pref., 20. vii. 1966, A. TANAKA; 1 ♀, Ōnogahara, Mt.





Figs. 8-9. *Laphria nigrovittata*, female. Posterior part of abdomen, dorsal and ventral views (based on No. 1 from Kamikochi, Nagano Pref.). C, cercus; S6-S8, sternum 6 to sternum 8; T6-T8, tergum 6 to tergum 8; T9 + 10, tergum 9 + 10.



Figs. 10-12. *Laphria nigrovittata*, female. 10-11, Tergum 8, tergum 9 + 10, sternum 9, sternum 10, cerci, and genital fork, dorsal and ventral views (based on No. 2 from Nukabira, Hokkaido); 12, sternum 8, ventral view (based on No. 2). C, cercus; GF, genital fork; S9-S10, sternum 9 to sternum 10; T8, tergum 8; T9 + 10, tergum 9 + 10.



Takakuma, Kagoshima Pref., 29. iv. 1968, A. TANAKA.

Japanese name: Kurosui-ishiabu.

Biology: Unknown in this species. LAVIGNE and BULLINGTON (1984) wrote: "All known larvae of the Laphriinae occur in dead wood (LAVIGNE et al., 1978). 'In *Laphria*, *Lampria* and *Bombomima* the ovipositor is short and the eggs are laid in shallow crevices of dead wood.' (BROMLEY, 1946). BROMLEY was referring primarily to eastern species with which he was familiar. Similar oviposition sites were recorded for species of European *Laphria* by MELIN (1923). *Laphria fernaldi* oviposition habits do not differ significantly from those previously mentioned, although no one has noted hovering prior to site selection."

Distribution. Japan (Hokkaido, Honshu, Shikoku and Kyushu).

#### Distinction between *Goneccalypsis lucida* and *Laphria nigrovittata* in female terminalia

The female terminalia of *G. lucida* (Atomosiini) differ markedly from those of *L. nigrovittata* (Laphriini) in the following points: tergum 8 and cerci situated beneath tergum 7 whose posterior margin is rounded; sternum 8 without midposterior protruded part; tergum 9 + 10 rectangular and transverse at posterior margin; sternum 10 larger than tergum 9 + 10; cerci widely separated and much shorter than sternum 8.

In *L. nigrovittata*, tergum 8 and cerci protruded behind tergum 7 whose posterior margin is transverse; sternum 8 with midposterior protruded part; tergum 9 + 10 semicircular or triangular and markedly convex at posterior margin; sternum 10 much smaller than tergum 9 + 10; cerci fused at posterior portion and longer than sternum 8.

Judging from the structure of female terminalia, the oviposition habits and sites must be different between these two species, genera or tribes.

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