

## The Japanese Species of the Genus *Gonocephalum* (Coleoptera, Tenebrionidae)

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**Abstract** A new species belonging to the genus *Gonocephalum* is described from Japan. A revised key to the Japanese species on the genus and a list of them are also given.

Since a monograph of the Indo-malaysian and East Asian species of the Genus *Gonocephalum* was published by KASZAB (1952), six new species of the genus have been described from Japan, two by T. NAKANE (1963), three by M. T. CHÛJÔ (1963, 1973 and 1975), one by the present author himself (1983). Two more species, which were previously known from Micronesia, have been introduced into the Japanese fauna by KULZER (1956) and M. SATÔ (1982).

Through the courtesy of Messrs. K. KAWADA and N. NISHIKAWA, the author was recently given the opportunity of studying a *Gonocephalum* obtained in central Japan. It has proved to be a new species, and will be described in this paper.

Adding to the description of the new species, the author is going to give a revised key to the Japanese species of the genus, together with illustrations of the diagnostic characters of all of them. A key to the Japanese species was already given by M. T. CHÛJÔ (1963), when *G. okinawanum* was described. However, it does not work well, probably because clear-cut features were not always adopted for designing it. He may not have examined all the species then known and may have taken out certain lines simply from KASZAB's work, whose scope is too wide to identify the Japanese species only. It is to be hoped that the renewed key given in this article will prove useful for future workers.

The author would like to express his grateful thanks to Dr. Z. KASZAB (Hungarian Natural History Museum) for loaning type specimens and giving duplicated ones belonging to Japanese fauna, to Messrs. K. KAWADA (Tokyo) and N. NISHIKAWA (Hokkaido University) for offering their materials to be described as the type specimens in this paper, and also to Professor M. SATÔ (Nagoya Women's University) and Mr. K. SAWADA (Kawasaki City) for giving him their valuable specimens for this study. Special thanks are due to Mr. S. KONDO (Tokyo) for spending many hours in assisting him in making a check-list of the Japanese *Gonocephalum*, also to Mr. T. ENDO (Tokyo) for drawing the many fine figures illustrated, and finally to Dr. S.-I. UÉNO (National Science Museum, Natural History, Tokyo), for his kindness in reading the manuscript of this paper and offering suggestions.

### Description of a New Species

#### *Genocephalum sawadai* sp. nov. (figs. 1a, 1b & 1c)

Dark blackish brown, with antennae, mouth parts, each trochanter and tarsi dark reddish brown, bent short hairs on upper surface pale yellowish brown, those on ventral surface a little brownish. Body oblong, moderately convex above.

Head rather transverse-hexagonal, weakly convex in posterior half, coarsely and closely punctate, punctures rather shallow, rugose in middle; fronto-clypeal border shallowly grooved and arcuate posteriad with both ends finer and reaching outer margin; clypeus deeply and roundly emarginate in front, roundly and moderately produced forward on both sides; genae moderately roundly produced laterad, obliquely depressed before eyes, outer margin only weakly indented at clypeo-genal border; eyes fairly small, distance between them about 6 times their transverse diameter in dorsal view; ocular sulcus deep and fine but invisible from above because each inner portion opposite eye somewhat cornice-shaped; antennae reaching basal  $2/5$  of pronotum, 5th segment oval, 6th and 7th spherical, 8th to 10th gradually thickened, 10th widest, relative length of each segment from basal one to apical as follows: 2.0, 0.8, 2.3, 1.1, 0.9, 0.8, 1.0, 1.1, 1.2, 1.2, 1.5.

Pronotum 1.7 times as broad as long, broadest at basal  $2/5$ , roundly narrowed forward, rather strongly narrowed to rear, weakly sinuate before base; front border widely arcuate posteriad, obsolete margin only laterally; basal border widely bisinuate, slightly indented at median, feebly margined except opposite of scutellum; lateral margins finely margined; front angles subrectangular and moderately produced forward; hind angles rather acute and pointed postero-laterad; disk moderately convex, closely punctate and rugose, somewhat corrugatedly sculptured, sparsely with bent short hairs, moderately depressed along margins. Scutellum semicircular, weakly convex, rugosely punctate and sparsely haired.

Elytra 1.5 times as long as broad, 1.2 times broader and 3 times longer than pronotum, broadest at middle, feebly narrowed to front, gradually and roundly narrowed to apical portion, shortly truncate at apex in dorsal view; dorsum moderately convex, thickest at middle, faintly flattened after scutellum; disk shallowly striated, striae punctures small and round, distance between them about 0.8-1.5 times their diameter; intervals very feebly convex, microshagreened and finely granulate, each with 2 rows of bent short hairs; sides rather steeply declined, so, lateral margins invisible in dorsal view.

Mentum inverted-pyriform, weakly raised medianly, gouged on both sides; terminal segment of maxillary palpus medium-sized, securiform, with arcuate outer side about 1.4 times length of inner, 1.1 times length of apical.

Prosternum asperate, raised along median, especially strongly so and then flattened in intercoxal space, with longer hairs than on upper surface, prosternal process wide but almost not produced posteriad; mesosternum short and asperate, raised in wide V-shape along antero-inner portions of mesocoxae, excavated at median of hind border; metasternum rather short, coriaceous, but somewhat vitreous in middle, more noticeably haired, depressed postero-medianly, with fine groove. Abdomen fairly large, also

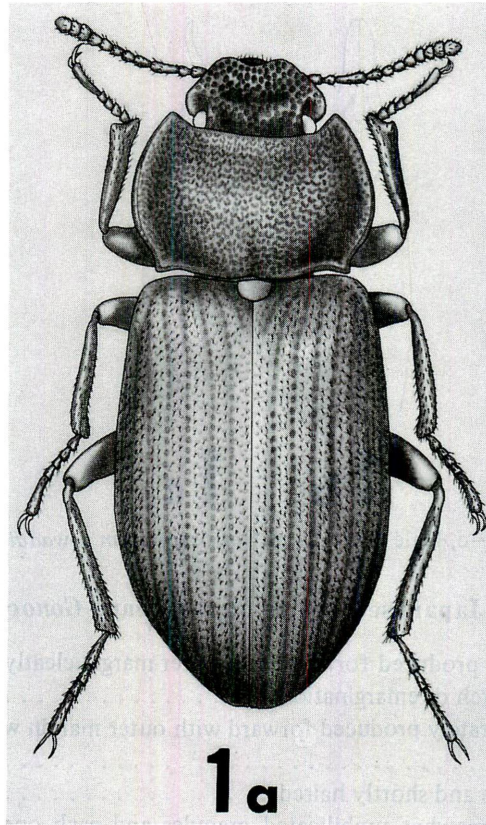


Fig. 1a, *Gonocephalum sawadai* sp. nov.

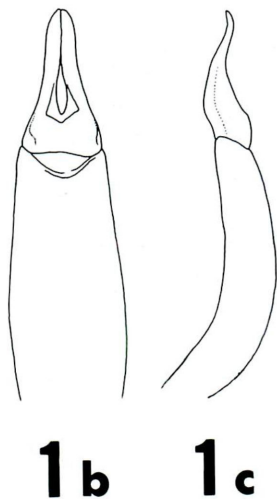
coriaceous, remarkably depressed in medial portion of 1st and 2nd sternites; outer margin of anal sternite finely margined.

Protibia in male moderately dilated to apex, nearly as wide as 2 basal segments combined at apex, inner margin indented in apical  $2/5$ , outer margin slightly sinuate in apical  $1/3$ , underside with ridge which is excavated in apical  $1/3$ , having tooth-like point at basal edge, in female more strongly widened, as wide as 3 basal segments of tarsus combined at apex, underside with low ridge but only lowered in apical  $1/3$ , without point as in male; relative length of each tarsal segment as follows: 1.4, 0.5, 0.4, 0.3, 3.7; 2.0, 0.7, 0.9, 1.2, 4.0; 4.0, 1.8, 1.5, 4.8.

Body length: 8.5–9.5 mm.

Holotype: ♂, Mizunesawa, Okutama, Tokyo, 28. IV. 1975, K. KAWADA leg.; paratype: 1 ex., Honkawane-chô, Shizuoka Pref., 16. VIII. 1980, Y. ISHIKAWA & R. TOYOSHIMA leg;

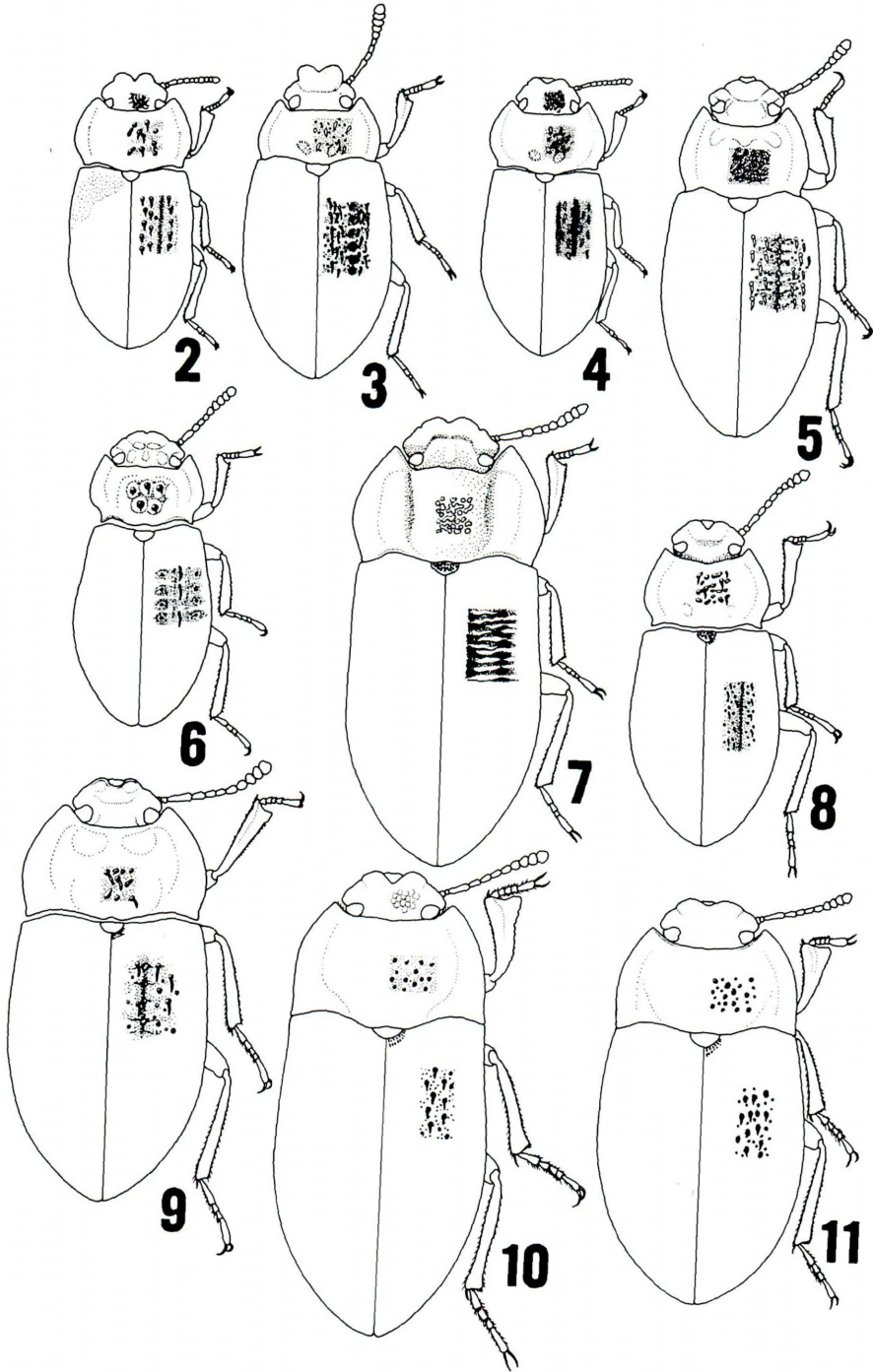
This new species is allied to *Gonocephalum coriaceum* MOTSCHULSKY, but is easily distinguishable from the latter by its unique sculpture on pronotum and its truncate apex of elytra.

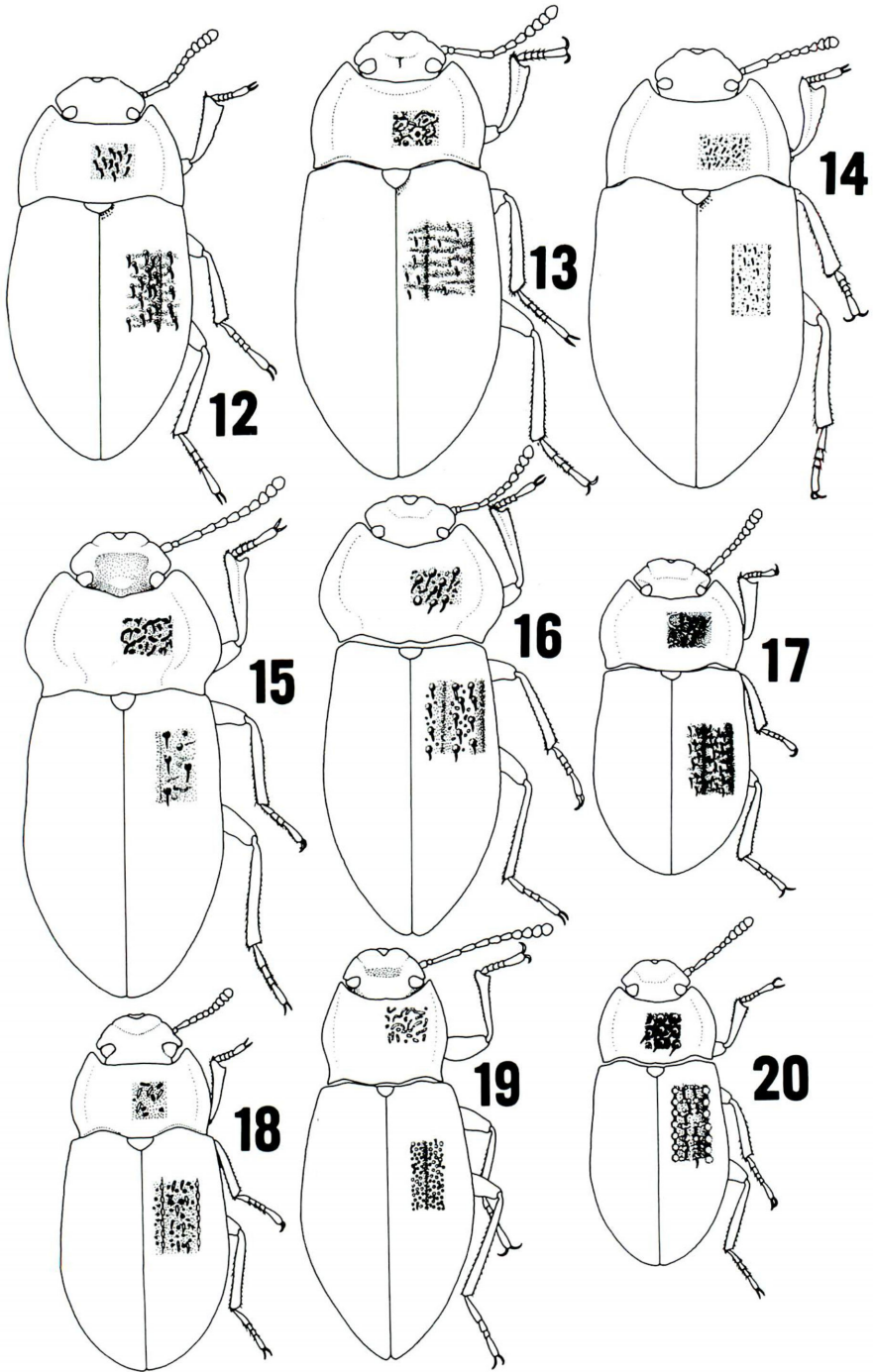


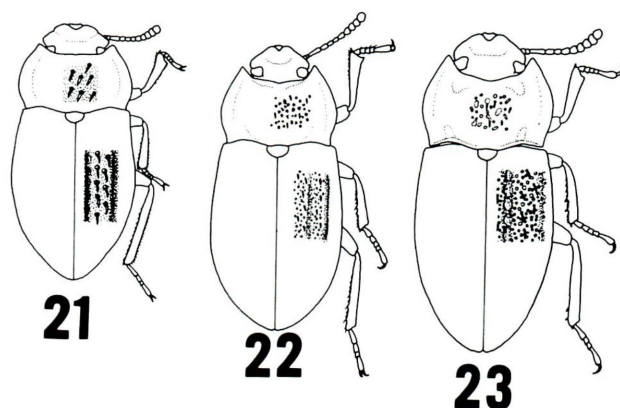
Figs. 1b-c, Male genitalia of *Gonocephalum sawadai* sp. nov.

#### Key to the Japanese Species of the Genus *Gonocephalum*

1. Clypeus noticeably produced forward with outer margin clearly separated from each genal margin by notch or emargination . . . . . 2
  - Clypeus only moderately produced forward with outer margin weakly separated from genal margins . . . . . 6
2. Pronotum granulate and shortly haired . . . . . 3
  - Pronotum with somewhat umbilicated granules and each one surrounded by low ridge . . . . . 5
3. Pronotum simply convex; elytral intervals with 1 or 2 rows of rather remarkable granules and hairs; 6-7 mm. (fig. 2) . . . . . *okinawanum* M. T. CHŪJŌ
  - Pronotum with spot-like depressions; elytra with fine granules and hairs in 2 or 3 rows at least . . . . . 4
4. Body larger, broader and convex above; clypeus extremely produced forward; genae oblique; pronotum with front angles narrowly rounded; 7-8 mm. (fig. 3) . . . . .
  - . . . . . *senkakuense* M. T. CHŪJŌ
  - Body smaller, narrower and less convex above; clypeus not extremely produced; pronotum with front angles more acute; 5.5-6 mm. (fig. 4) . . . . . *pottsii* KULZER
5. Body rather flattened; pronotum less strongly narrowed before base; elytra with larger and smaller granules, only former with short hair each, 2-3 rows on every interval; ca. 9 mm. (fig. 5) . . . . . *klapperichii* KASZAB
  - Body moderately convex; pronotum strongly narrowed before base with hind angles acute and pointing postero-laterad; elytral intervals with single row of similar granules, each with comparatively longer hair, 7-8 mm. (fig. 6) . . . . . *titschacki* KASZAB
6. Protibia very broad, with outer margin sharply edged . . . . . 7
  - Protibia narrow, with outer margin mostly rounded . . . . . 14







Explanation of figs. 2–23. *Gonocephalum* spp. — 2, *G. okinawanum* M. T. CHŪJŌ; 3, *G. senkakuense* M. T. CHŪJŌ; 4, *G. possti* KULZER; 5, *G. klapperichi* KASZAB; 6, *G. titschacki* KASZAB; 7, *G. bilineatum* (WALKER); 8, *G. persimile* (LEWIS); 9, *G. macrophthalmum* KASZAB; 10, *G. recticolle* MOTSCHULSKY; 11, *G. terminale* REICHARDT; 12, *G. kondoi* MASUMOTO; 13, *G. annamita* CHATANAY; 14, *G. pubens* (MARSEUL); 15, *G. japanum* MOTSCHULSKY; 16, *G. miyakense* NAKANE; 17, *G. coenosum* KASZAB; 18, *G. adpressiforme* KASZAB; 19, *G. sexuale* (MARSEUL); 20, *G. moluccanum* (BLANCHARD); 21, *G. takara* NAKANE; 22, *G. coriaceum* MOTSCHULSKY; 23, *G. acoriaceum* M. T. CHŪJŌ. Small areas of pronotum and elytron are drawn in a magnified scale of 2 x compared with the body to show puncturation and microsculpture.

7. Elytra not or only very weakly raised behind scutellum; scutellum not shining, punctate, granulate and haired, only narrowly smooth and shining posteriorly . . . 8
- Elytra rather distinctly raised behind scutellum; scutellum smooth, shining, glabrous, or mostly haired only in basal portion . . . . . 9
8. Body larger and subparallel-sided; pronotum broadly explanate laterally, with shallow longitudinal groove along median elevation, lateral margins just widely arcuate, hind angles subrectangular; elytra feebly, transversely wrinkled; 9–12 mm. (fig. 7) . . . . . *bilineatum* (WALKER)
- Body smaller and oblong oval; pronotum rather simply convex above, lateral margins strongly sinuate before base, hind angles acute; elytra granulate, sparsely with pale hairs; 7–9 mm. (fig. 8) . . . . . *persimile* (LEWIS)
9. Protibia dilated to apex, with outer and inner margins straight, or dilated outward at apex; male abdomen not impressed, mostly flattened . . . . . 10
- Protibia curved, with outer and inner margins not straight; male abdomen mostly rather strongly impressed in middle . . . . . 12
10. Eyes fairly large; pronotum narrower than elytra at base, rather widely explanate and weakly reflexed above in lateral portions; prosternum not producing posteriad; 10–11 mm. (fig. 9) . . . . . *macrophthalmum* KASZAB
- Eyes smaller; pronotum nearly same width as elytra at base, comparatively narrowly explanate laterally; prosternal process roundly pointed . . . . . 11

11. Body a little larger, relatively more oblong and less shining, more finely granulate; pronotum comparatively more widely explanate; male protibia with inner margin clearly emarginate in basal half, female one simply, strongly widened to apex; 11-13 mm. (fig. 10) . . . . . *recticollis* MOTSCHULSKY
- Body smaller, more oval and comparatively more shining; relatively a little coarsely and closely granulate (especially distinct on pronotum); pronotum less widely explanate laterally; protibia with inner margin simple in both sexes; 9.5-12 mm. (fig. 11) . . . . . *terminale* REICHARDT
12. Body smaller; upper surface wholly, rather densely covered with fine granules and short hairs; 8.3-9.8 mm. (fig. 12) . . . . . *kondoii* MASUMOTO
- Body larger; upper surface not densely covered with granules and short hairs . . . 13
13. Body comparatively oblong; elytra with intervals feebly convex, transversely wrinkled and sparsely haired; 10.5-15 mm. (fig. 13) . . . . . *annamita* CHATANAY
- Body rather oval; elytra finely but clearly striated, with intervals flat and not wrinkled but finely, closely granulate; 11-12 mm. (fig. 14) . . . *pubens* (MARSEUL)
14. Male pro- and mesotibia simple, or mostly protibia with obtuse edge on underside, without tooth, or without large serrulation . . . . . 15
- Male pro- and mesotibia with sharp teeth, or more sharpened serrulation . . . . . 18
15. Pronotum arcuate laterad and remarkably broader than elytra . . . . . 16
- Pronotum not broader than elytra . . . . . 17
16. Pronotum with front and hind angles comparatively less acute, elytra moderately arcuate laterad; 10.5-12 mm. (fig. 15) . . . . . *japanum* MOTSCHULSKY
- Pronotum with front and hind angles more acute; elytra rather narrow and subparallel-sided; 10.2-11 mm. (fig. 16) . . . . . *miyakense* NAKANE
17. Eyes a little smaller; gena angulate laterad and widest at line before eye; pronotum comparatively broader with front angles less acute; 7-9.5 mm. (fig. 17) . . . . .
- . . . . . *coenosum* KASZAB
- Eyes larger; gena rather rounded and widest at line at middle of eye; pronotum narrower with front angles more acute and slightly protruded forward; 8.5-9.5 mm. (fig. 18) . . . . . *adpressiforme* KASZAB
18. Body widened posteriorly; pronotum remarkably narrower than elytra with front angles distinctly acute and protruded forward, upper surface finely, closely granulate; elytra sparsely with short, white hairs; protibia only granulate on underside; mesotibia suddenly thickened apically with outer margin straight, inner curved inward, and metatibia with inner margin sharply serrulate in male; 9.5-12 mm. (fig. 19) . . . . . *sexuale* (MARSEUL)
- Body mostly oblong-oval; pronotum not as narrower as elytra with front angles not very acute and protruded; male protibia with strong tooth; mesotibia with outer and inner margins straight, inner apex not curved inward, metatibia only with blunt serrulation in both sexes . . . . . 19
19. Pronotum weakly with granules, each with distorted low surrounding ridge; elytra with intervals feebly shining; 6.5-10 mm. (fig. 20) . . . *moluccanum* (BLANCHARD)
- Pronotum without granules with distorted low ridges; elytra with intervals not



- shining . . . . . 20
20. Body smaller; upper surface rather densely haired; 6–7.5 mm. (fig. 21) . . . . .  
 . . . . . *takara* NAKANE  
 – Body larger; upper surface sparsely haired . . . . . 21
21. Pronotum punctate and rugose, so, seemed to be somewhat corrugated; elytra truncate at apex in dorsal view; 8.5–9.5 mm. (fig. 1a, 1b, & 1c) . . . . . *sawadai* sp. nov.  
 – Pronotum not punctate but more or less granulate; elytra rounded at apex . . . . . 22
22. Pronotum rather closely granulate; elytra weakly and finely striated; 7–9 mm. (fig. 22) . . . . . *coriaceum* MOTSCHULSKY  
 – Pronotum sparsely granulate; elytra rather noticeably striated, with intervals more coarsely granulate; 7.2–8 mm. (fig. 23) . . . . . *acoriaceum* M. T. CHÛJÔ

### List of the Japanese Species of the Genus *Gonocephalum*

1. *Gonocephalum okinawanum* M. T. CHÛJÔ  
*Gonocephalum okinawanum* M. T. CHÛJÔ, 1963, Kontyu, Tokyo, 31: 149.  
 Distr.: Ryukyu Is. (Tokara Is., Amami Is., Okinawa Is., Iriomotejima).
2. *Gonocephalum senkakuense* M. T. CHÛJÔ  
*Gonocephalum senkakuensis!* M. T. CHÛJÔ, 1973, Esakia, Kyushu Univ., (8): 13.  
 Distr.: Ryukyu Is. (Yonagunijima, Uotsurijima).
3. *Gonocephalum possti* KULZER  
*Gonocephalum possti* KULZER, 1957, Ins. Micronesia, 17 (3): 194.  
 Distr.: Bonin Is. (Chichijima), Volcano Is. (Iwojima); Micronesia.
4. *Gonocephalum klapperichi* KASZAB  
*Gonocephalum klapperichi* KASZAB, 1952, Ent. Arb. Mus. Frey, 3: 550.  
 Distr.: Japan (Honshu, Niijima, Himeshima); China.
5. *Gonocephalum titschacki* KASZAB  
*Gonocephalum titschacki* KASZAB, 1952, Ent. Arb. Mus. Frey, 3: 509.  
 Distr.: Japan (Shikoku); China.
6. *Gonocephalum bilineatum* (WALKER)  
*Opatrum bilineatum* WALKER, 1858, Ann. Mag. nat. Hist., (3) 2: 284.  
 Distr.: Japan (Honshu); China, Kamchatka, S. E. Asia, Micronesia, Melanesia.
7. *Gonocephalum persimile* (LEWIS)  
*Opatrum persimile* LEWIS, 1894, Ann. Mag. nat. Hist., (6) 13: 381.  
 Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Sado, Mikurajima, Hachijojima, Oki, Tsushima); Korea, N. E. China, Ussuri, Mongolia.
8. *Gonocephalum macrophthalmum* KASZAB  
*Gonocephalum macrophthalmum* KASZAB, 1952, Ent. Arb. Mus. Frey, 3: 582.  
 Distr.: Japan (Shikoku); Indochina.
9. *Gonocephalum recticolle* MOTSCHULSKY  
*Gonocephalum recticolle* MOTSCHULSKY, 1866, Bull. Soc. Nat. Mosc., 39: 173.  
 Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima); Ussuri.
10. *Gonocephalum terminale* REICHARDT

- Gonocephalum terminale* REICHARDT, 1936, Tabl. Anal. Fauna URSS, **19**: 110.  
Distr.: Japan (Hokkaido, Honshu, Shikoku, Amakusajima, Iki, Tsushima);  
Korea, E. Siberia.
11. *Gonocephalum kondoi* MASUMOTO  
*Gonocephalum kondoi* MASUMOTO, 1983, Ent. Rev. Japan, **38** (2): 173.  
Distr.: Ryukyu Is. (Ishigakijima, Iriomotejima).
12. *Gonocephalum annamita* CHATANAY  
*Gonocephalum annamita* CHATANAY, 1917, Bull. Mus. Hist. nat. Paris, (4): 236.  
Distr.: Japan (Shikoku); China, S. E. Asia, India.
13. *Gonocephalum pubens* (MARSEUL)  
*Opatrum (Gonocephalum) pubens* MARSEUL, 1876, Ann. Soc. ent. France, (5)  
**6**: 97.  
Distr.: Japan (Honshu, Shikoku, Kyushu); Korea, China.
14. *Gonocephalum japanum* MOTSCHULSKY  
*Gonocephalum japanum* MOTSCHULSKY, 1860, Étud. ent., **9**: 16.  
Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Sado, Hachijojima, Oki,  
Tsushima).
15. *Gonocephalum miyakense* NAKANE  
*Gonocephalum miyakense* NAKANE, 1963, Fragm. Col., (6): 26.  
Distr.: Japan (Izu-Oshima, Kozujima, Miyakejima, Mikurajima).
16. *Gonocephalum coenosum* KASZAB  
*Gonocephalum coenosum* KASZAB, 1952, Ent. Arb. Mus. Frey, **3**: 643  
Distr.: Japan (Honshu, Shikoku, Kyushu, Tsushima), Ryukyu Is. (Tokara  
Is., Miyako Is., Yaeyama Is., Senkaku Is.); Korea, China, Formosa.
17. *Gonocephalum adpressiforme* KASZAB  
*Gonocephalum adpressiforme* KASZAB, 1951, Ann. Mag. nat. Hist., (12) **4**: 182.  
Distr.: Volcano Is. (Minami-Iwojima); Philippines, Micronesia.
18. *Gonocephalum sexuale* (MARSEUL)  
*Opatrum (Gonocephalum) sexuale* MARSEUL, 1876, Ann. Soc. ent. France, (5)  
**6**: 98.  
Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu); Korea, China, Ussuri.
19. *Gonocephalum moluccanum* (BLANCHARD)  
*Opatrum moluccanum* BLANCHARD, 1853, Voy. Pôle Sud, Zool., **4**: 153.  
Distr.: Ryukyu Is. (Tokara Is., Okinawa Is., Yaeyama Is.); China, Formosa,  
S. E. Asia, Ceylon, India, Philippines, New Guinea.
20. *Gonocephalum takara* NAKANE  
*Gonocephalum coriaceum takara* NAKANE, 1963, Fragm. Col., (6): 26.  
Distr.: Ryukyu Is. (Takarajima).
21. *Gonocephalum sawadai* sp. nov.
22. *Gonocephalum coriaceum* MOTSCHULSKY  
*Gonocephalum coriaceum* MOTSCHULSKY, 1857, Études ent., **6**: 34  
Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Sado, Izu Is., Oki,  
Tsushima, Danjo Is., Kuroshima, Yakushima), Ryukyu Is. (Amami-Oshima);  
Kuroshima, Korea, China, Formosa.

23. *Gonocephalum acoriaceum* M. T. CHÛJÔ  
*Gonocephalum acoriaceum* M. T. CHÛJÔ, 1975, Esakia, Kyushu Univ., (9): 15.  
Distr.: Japan (Tanegashima, Yakushima), Ryukyu Is. (Ishigakijima).

摘 要

日本産スナゴミムシダマシ属 (*Gonocephalum*) の 1 新種を記載し, 併せて日本に分布する同属のすべての検索表とリストを作成した.