

HEMISPHAERIINAE OF THE JAPAN ARCHIPELAGO (HEMIPTERA : ISSIDAE)¹⁾

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In 1906, Melichar divided the family Issidae into three groups, namely Caliscelidae, Issidae and Hemisphaeriidae. Most of all hemipterists followed him.

The subfamily Hemisphaeriinae, which has the hemispherical body similar to lady-beetle, is separable easily from the two other groups.

Butler (1875) described a species as the first species from Japan. In Melichar's monograph (1906) two Japanese species were shown. Schumacher (1915) reported eleven species including a new genus *Gergithoides* and eight new species of *Hemisphaerius*, *Gergithus* or *Gergithoides* in his two papers. In the next year, Matsumura (1916) published the revisional study of Japanese and Formosan Issidae, in which he made belong fourteen species including eleven new species to the subfamily Hemisphaeriinae, later he (1923) described a new species of *Gergithus* from I. Okinawa. Kato (1933) described a new species of *Gergithus* from Formosa.

Recently I could examine a considerable number of specimens of Hemisphaeriinae.

In the genus *Gergithus* some species so widely vary in the coloration that it is difficult to be separated to species according only to the coloration. The male genital characters, however, help us identify them.

In the present paper, I want to give descriptions of a new genus and five new species belonging to *Hemisphaerius* or *Gergithus*, together with some new synonymies.

Before going further, I wish to express my hearty thanks to Prof. Dr. T. Ishihara, Prof. Dr. T. Tachikawa, Mr. M. Miyatake and Mr. S. Hisamatsu of Ehime University for their kind guidance and constant encouragement. I would like to extend many thanks also to Prof. Dr. C. Watanabe and Dr. S. Takagi of Hokkaido University who offered me much benefit in examining and photographing the Matsumura's type specimens. I must express my sincere thanks also to Mr. Y. Arita, Mr. K. Hatta, Mr. H. Hasegawa, Dr. Y. Hirashima, Mr. I. Hiura, Mr. N. Ohbayashi, Mr. Y. Miyatake, Mr. S. Nomoto, Mr. M. Satô, Dr. T. Shirôzu, Mr. M. Takagi, Mr. S. Tamai, Mr. S. Ueda et al., who helped me in the material, literature or in giving me valuable advice.

Key to the genera of Hemisphaeriinae of the Japan Archipelago

- 1(2) Frons with lateral and median carinae, reticulate, one and half times as long as wide, straightly divergent, widest subapically *Gergithoides* Schumacher
2(1) Frons without any carinae.

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- 3 (4) Frons levigate, a little shorter than one and a half times the width. Pronotum very short, about half as long as between eyes *Ishiharanus* gen. nov.
 4 (3) Frons more or less reticulate, nearly as wide as long.
 5 (6) Wings rudimentary *Hemisphaerius* Schaum
 6 (5) Wings developed.
 7 (8) Anterior margin of vertex carinated, lateral margins of frons roundly diverging to below level of antennae thence smoothly incurved, not subangulate *Mongoliana* Distant
 8 (7) Anterior margin of vertex not carinated, lateral margins of frons straight, divergent distally as far as subangulate inflexure below level of antennae *Gergithus* Stål

Genus *Gergithus* Stål, 1870

Gergithus Stål, 1870, Vet. Akad. Förk. 28: p. 756; *Hemisphaerius*: Melichar, 1903, p. 74; *Gergithus*: Melichar, 1906, p. 58; Distant, 1909, p. 86; Schumacher, 1915 a, p. 134; Schumacher, 1915 b, p. 127; Matsumura, 1916, p. 97; Fennah, 1956, p. 506; Ishihara, 1965, p. 108.

Type-species: *Hemisphaerius schauumi* Stål, 1855.

The distribution of this genus is Japan and the Oriental region.

Sixteen species including four new ones in this paper are distinguished from one another by the following key.

Key to the species of *Gergithus* of the Japan Archipelago

- 1 (6) Frons with a distinct whitish or greenish band near apex.
 2 (3) Body comparatively elongate. Tegmina blackish with a yellowish longitudinal stripe *G. lineatus* Kato
 3 (2) Body almost round. Tegmina without any stripe.
 4 (5) Tegmina not reticulated (only longitudinal veins elevated), dark brown with eight or nine greenish or yellowish spots arranged in four lines *G. tessellatus* Matsumura
 5 (4) Tegmina strongly reticulated (cross-veins also elevated), sordid brown with several blackish blots and blackish costal margin *G. reticulatus* Matsumura
 6 (1) Frons entirely concolorous though apical parts are more or less paler in some species.
 7 (22) Tegmina without any markings.
 8 (21) Tegmina greenish or brownish.
 9 (12) Tegmina generally greenish.
 10 (11) Posterior margins of vertex and of pronotum tinged with pale yellow or pale green. Scutellum weakly punctured and rugose in apical part. Wings with a slightly dark tint and darker veins. Length 4.5-5 mm *G. yayeyamensis* sp. nov.
 11 (10) Posterior margins of vertex and of pronotum without pale tint. Scutellum reticulate. Wings with colorless veins. Length 6-7 mm *G. affinis* Schumacher
 12 (9) Tegmina brownish.
 13 (14) Costal margin of tegmina conspicuously black *G. nigrolimbatus* Schumacher
 14 (13) Tegmina without dark margin with a few exceptions in which costal margins are narrowly and faintly infuscated.
 15 (16) Hind femora infuscated apically *G. horishanus* Matsumura
 16 (15) Hind femora concolorously brown.
 17 (18) Aedeagus stout, with the twisting apical half, and the left and right spines both arising subapically *G. variabilis* (Butler)
 18 (17) Not as above.

- 19 (20) Aedeagus curved and attenuate, left spine arising subapically and the right posterior to the left, with the apices both reaching the base. Anal segment of the male oval *G. okinawanus* Matsumura
- 20 (19) Left spine of aedeagus arising from about the middle toward the right side and right spine arising posterior to the left one, with the apex extending to the base of aedeagus. Anal segment of the male as long as wide *G. satsumensis* Matsumura
- 21 (8) Tegmina entirely blackish brown with a few exceptions in which they have paler parts subapically *G. variabilis* (Butler)
- 22 (7) Tegmina with several spots or stripes.
- 23 (28) Tegmina with stripes or bands.
- 24 (25) Tegmina in distal halves each with two blackish bands, of which anterior is sometimes very short *G. bistriatus* (Schumacher)
- 25 (24) Tegmina without any bands.
- 26 (27) Tegmina each with a narrow blackish stripe along the costal margin excepting the base. Clypeus darker than in frons. Legs mostly concolorously brown *G. satsumensis* Matsumura
- 27 (26) Tegmina each with two blackish oblique stripes in distal half. Clypeus somewhat paler than frons. Legs mostly brownish with a broad blackish band near apex of each profemora *G. taiwanensis* sp. nov.
- 28 (23) Tegmina irregularly with paler or darker areas.
- 29 (30) Tegmina heavily reticulate, stramineous, with several pale yellowish or pale greenish areas irregularly *G. stramineus* sp. nov.
- 30 (29) Not as above.
- 31 (34) Body mostly dark brown.
- 32 (33) Tegmina each with several pale parts in distal half and a pale stripe along the costal margin from near base to apex. Length about 5 mm *G. satsumensis* Matsumura
- 33 (32) Tegmina each with two brownish areas in the basal and apical halves, though sometimes basal ones are absent. Costal stripe short. Length about 6.5 mm *G. flaviguttatus* sp. nov.
- 34 (31) Body mostly brownish.
- 35 (36) Frons greenish. Tegmina brownish with green and black stripes *G. robustus* Schumacher
- 36 (35) Frons brown.
- 37 (38) Frons distinctly convex. Tegmina with three blackish spots costally *G. longulus* Schumacher
- 38 (37) Frons comparatively flattened. Tegmina each with eight yellowish or pale greenish spots and blackish stripe near the costal margin *G. variabilis* (Butler)

1. *Gergithus variabilis* (Butler, 1875) [Fig. 2: 8-10; Pl. 2: 1, 3]

Butler, 1875, p. 98, pl. 4, fig. 21 (*Hemisphaerius*); Matsumura, 1905 b, p. 53, pl. 21, fig. 2 (*Hemisphaerius*); Melichar, 1906, p. 65; Distant, 1909, p. 86 (*Hemisphaerius*); Schumacher, 1915 a, p. 134; Schumacher, 1915 b, p. 128; Matsumura, 1916, p. 99; Matsumura, 1931, p. 1267, fig. 421 (*Hemisphaerius*); Matsumura, 1932 a, p. 234, pl. 9, fig. 3 (*Hemisphaerius*); Matsumura, 1932 b, p. 74, pl. 18, fig. 22 (*Hemisphaerius*); Esaki, 1932, p. 1796, fig. 3549; Kato, 1933 b, pl. 13; Esaki, 1950, p. 321, fig. 866; Ishihara, 1965 b, p. 131, pl. 66, fig. 10.

Clypeus darker than frons. In almost individuals the apex of frons and the base of clypeus pale. Tegmina dark brown with four or five yellowish or greenish spots, though they are sometimes very indistinct. Aedeagus stout, with the apical half

twisting to the right in dorsal view and a pair of long horn-like spines on the ventral surface subapically, which are 7/10 times as long as aedeagus.

This species is the commonest, in southern Japan and I could examine many specimens collected in the following localities. Honshu (Mt. Takao, Tokyo pref.; Gifu pref.; Mt. Hira, Shiga pref.; Mt. Kasuga, Nara pref.; Mt. Kongo, Osaka pref.; Nose, Osaka pref.; Mt. Haiga-Mine, Hiroshima pref.). Shikoku (Sawadani, Tokushima pref.; Mt. Tsurugi, Tokushima pref.; Sugitate, Komenono and Mt. Sara, all near Matsuyama, Ehime pref.; Omogokei, Ehime pref.). Kyushu (Mt. Hikosan, Fukuoka pref.; Mt. Tachibana, Fukuoka pref.; Kanayama, Fukuoka pref.; Hitoyoshi, Kumamoto pref.; Mt. Konpira, Nagasaki pref.). Hachijō-jima.

Distribution: Honshu, Shikoku, Kyushu, Hachijō-jima and Formosa.

In this species, the following forms in coloration, so called varieties, are known.

1 a. *Gergithus variabilis* forma *unicolor* Butler [Pl. 2: 2]

Butler, 1875, p. 98; Melichar, 1906, p. 65; Schumacher, 1915 b, p. 128; Matsumura, 1916, p. 99; Kato, 1933 b, pl. 13, fig. 13; Esaki, 1950, p. 321;

Specimens examined: Many examples from following localities. Honshu (Mt. Takao, Tokyo pref.) Shikoku (Kuroson, Kohchi pref.; Mt. Kajigamori, Kōchi pref.; Ashizuri, Kōchi pref.; Sugitate, Komenono and Mt. Takanawa, all near Matsuyama, Ehime pref.; Mt. Iwayaji, Ehime pref., Omogokei, Ehime pref.; Mt. Zōzu, Kagawa pref.). Kyushu (Konose, Kumamoto pref.; Mt. Hikosan, Fukuoka pref.; Mt. Tachibana, Fukuoka pref.). Is. Tsushima.

Distribution: Honshu, Shikoku, Kyushu, Is. Tsushima and Formosa.

This form is of the concolorous coloration.

1 b. *Gergithus variabilis* forma *carbonarius* Melichar [Pl. 2: 4]

Gergithus carbonarius Melichar, 1906, p. 65; Matsumura, 1916, p. 99; Esaki, 1932, p. 1796, fig. 3550; Matsumura, 1932 a, p. 235; *Gergithus variabilis* forma *carbonarius*: Esaki, 1950, p. 321; Ishihara, 1965 b, p. 132, pl. 66, fig. 10.

Specimens examined: 20 ♀ ♀ from following localities. Honshu (Mt. Takao, Tokyo pref.; Numazu, Shizuoka pref.; Mt. Ogura, Kyoto pref.; Mt. Haigamine, Hiroshima pref.; Mt. Daisen, Tottori pref.). Shikoku (Sugitate, Ehime pref.; Omogokei, Ehime pref.). Kyushu (Mt. Hikosan, Fukuoka pref.; Mt. Tachibana, Fukuoka pref.; Kanayama, Fukuoka pref.).

Distribution: Honshu, Shikoku and Kyushu.

I could find no male of this form, and therefore, this form seems to appear only in the female.

2. *Gergithus satsumensis* Matsumura, 1916 [Fig. 1: 4-6; Pl. 2: 5-8]

Matsumura, 1916, p. 101.

Frons brown, with pale apex, scarcely broader than length in median line. Clypeus black excepting for basal part which is whitish. Tegmina dark brown, though sometimes tinged with sordid yellowish green, and with a blackish narrow stripe along the costal margin. Aedeagus with two horn-like spines which are shorter than those in *Gergithus variabilis* (Butler), of which left spine is arising at a point of about

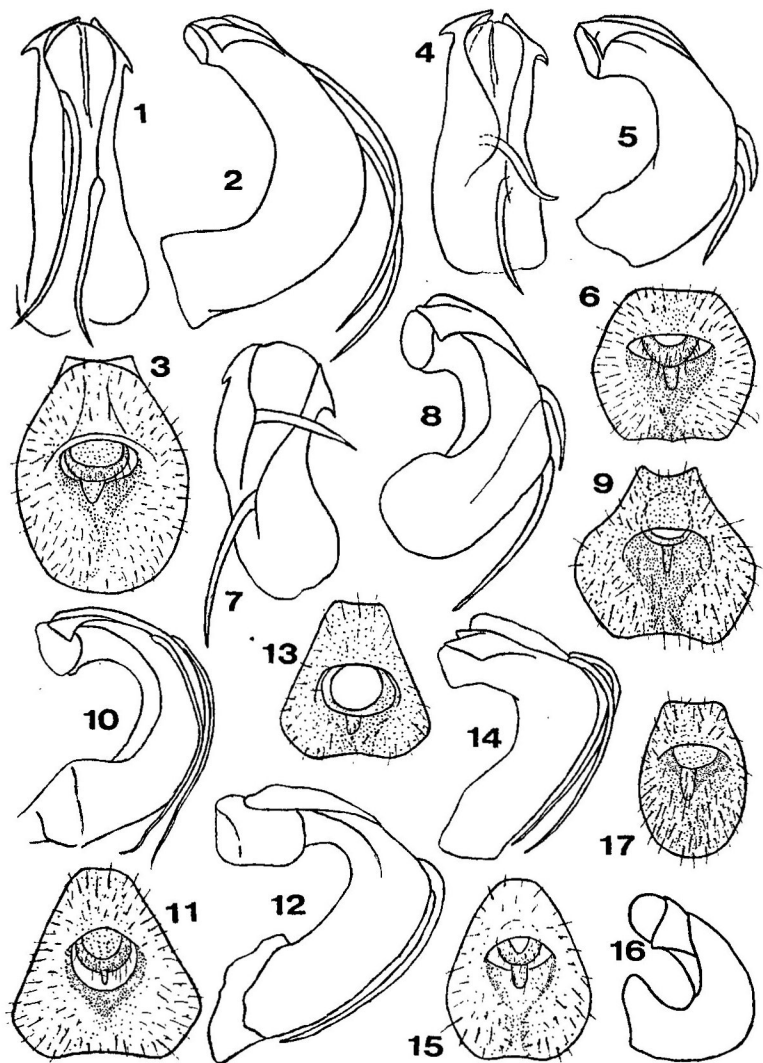


Fig. 1. 1-3, *Gergithus okinawanus* Matsumura; 4-6, *G. satsumensis* Matsumura; 7-9, *G. taiwanensis* sp. nov.; 10 and 11, *G. yayeyamensis* sp. nov.; 12 and 13, *G. affinis* Schumacher; 14 and 15, *G. bistratus* (Schumacher); 16 and 17, *Hemisphaerius takagii* sp. nov. 1, 4 and 7, Aedeagus in ventral view; 2, 5, 8, 10, 12, 14 and 16, Aedeagus in lateral view; 3, 6, 9, 11, 13, 15 and 17, Anal segment.

middle of aedeagus and developed toward the right side and right one is arising at a posterior point, with the apex extending to the base of aedeagus.

Specimens examined: 1 ♀, Koyama, Kagoshima pref., 21. IX, 1956, T. Kodama leg.; 6 ♂♂ 8 ♀♀ Cape Sata, Kagoshima pref., 25-30. V, 1953, I. Hiura leg.; 1 ♂ Cape Sata, Kagoshima pref., 9. VI, 1959, J. Nagao leg.; 1 ♀ Yaku-shima I., 16. VII, 1936, Y. Yano leg.; 4 ♂♂ 1 ♀ Takara I., Tokara Is., 5-6. VI, 1962, M. Satō leg.; 7 ♂♂ 5 ♀♀ Yuwan, Amami-Oshima, 29-31. VII, 1963, Y. Hirashima leg.; 1 ♂ Yuwan, Amami-Oshima, 22. VII, 1960, A. Kawazoe leg.; 2 ♀♀ Hatsuno, Amami-Oshima, 13-14. VI, 1962, M. Satō leg.; 1 ♂ 1 ♀ Shinmura, Amami-Oshima, 20-21. VII, 1955, T. Shirōzu leg.; 1 ♀ Amata~Furusato, Okinoerabu I., 8. VIII, 1963, K. Yasumatsu et K. Yano leg.

Distribution: Kyushu (Kagoshima) and Ryukyus (Takara I., Amami-Oshima and Okinoerabu I.).

According to the Matsumura's specimens examined by me, I am sure that the specimen (♀ Examplare aus Okinawa) to which he gave the following description, "diese Streifen ganz fehlen" was truly *Gergithus okinawanus*, which was described later by him, and therefore, this species does not occur in Okinawa I. and must be omitted in the distribution.

This species is quite variable in the coloration. The tegmina are entirely brown, without any marking in some specimens, while they are mostly black, with several brownish areas and brownish stripes along the costal margin in others.

3. *Gergithus taiwanensis* sp. nov. [Fig. 1: 7-9; Pl. 2: 9]

Length 4.5 mm. Width 3.5 mm. Vertex brown, sparsely with fine punctures, two and a half times as broad as long. Posterior margin weakly carinated, and both sides of the median line slightly hollowed. Pronotum concolorous with vertex, with two small pits which are connected with each other by a shallow fine groove. Scutellum concolorous with vertex excepting for the pale apical part, medially heightened and weakly carinated, with indistinct lateral carinae. Frons entirely dark brown, nearly as broad as long, not rounded, with very fine carinae submarginally along the lateral margins. Clypeus rounded, somewhat paler than frons. Tegmina mostly dark brown, somewhat lustrous, with a blackish stripe along the costal margin in apical half, and another stripe running parallel to the first one, and connected with it at the middle of costal margin. Tegminal veins indistinct. Wings elongate, definitely shorter than tegmina. Legs mostly brownish, with a broad blackish band near apex of profemora and dark brown in protibiae. Post-tibiae laterally with two spines and apically with six spines. Hind legs at apex of basitarsus with nine and at apex of second segment with two spines. Anal segment of male widest at the middle. Male genitalia similar to that of *Gergithus satsumensis* Matsumura in structure.

Specimen examined: ♂ (holotype) Formosa, 22. VII, 1968, M. Tomokuni leg., preserved in Ent. Lab. Coll. Agric. Ehime Univ.

Distribution: Formosa.

Although this new species resembles *Gergithus satsumensis* Matsumura, it differs from the latter in the tegmina further more smoothed and more lustrous, the clypeus not darker than frons and the anal segment divergent posteriorly.

4. *Gergithus okinawanus* Matsumura, 1936 [Fig. 1: 1-3; Pl. 2: 10]

Matsumura, 1936, p. 82.

Hemisphaerius flavimacula: Matsumura (nec Walker, 1851), 1905 a, p. 19.

Anal segment of male oval. Aedeagus recurved and attenuate, with a pair of long horn-like spines. The left spine arising from near apex and right one from about the middle.

Specimens examined: 1 ♂ 2 ♀♀ Yona, Okinawa I., 21-23. IV, 1963, Y. Arita leg.; 1 ♂ 1 ♀ Yona, Okinawa I., 11. VIII, 1965, S. Ueda leg.

Distribution: Ryukyus (Okinawa I.).

This species resembles *Gergithus satsumensis* Matsumura, however, they are separable from each other by the genital characters.

5. *Gergithus yayeyamensis* sp. nov. [Fig. 1: 10-11; Pl. 2: 11]

Length ♂ about 4.5 mm, ♀ about 5 mm. Width ♂ about 3.5 mm, ♀ about 4 mm. Vertex dark brown, three times as broad as long, posterior margin pale, and weakly carinated. Pronotum concolorous with vertex, definitely broader than vertex. Scutellum brown, with two small spots near base. Clypeus weakly carinated medially, more or less darkened, with two blackish longitudinal stripes. Tegmina green or greenish brown, without any marking, netted veins distinct. Wings definitely shorter than tegmina, with netted veins. Legs mostly dark brown excepting for hind-femora which are blackish. Post-tibiae with laterally two spines, and at apex six spines. Hind basitarsi each with nine spines at apex and the second segment each with two ones. Anal segment of male about as long as wide, expanding distally and widest near apex. Aedeagus strongly recurved, with a pair of slender horn-like spines which are equal in length and arising at a point of about one-fourth from the apex.

Specimens examined: 4 ♂♂ 3 ♀♀ (holotype and paratypes), Takeda, Ishigaki I. 24-30. III, 1962, Y. Arita et S. Tamai leg.; 3 ♀♀ (paratypes) Inaba, Iriomote I., 2-4. IV, 1962, S. Tamai leg.; 1 ♂ (paratype) Unishukuno-mori, Iriomote I., 7. VIII, 1962, M. Satō leg.; 1 ♂ (paratype) Sonai, Iriomote I., 28. VI, 1965, K. Hatta leg.; 1 ♂ (paratype) Sonai~Inaba, Iriomote I., 30. VI, 1968, M. Takagi leg. All preserved in Ent. Lab. Coll. Agric. Ehime Univ.

Distribution: Ryukyus (Ishigaki I. and Iriomote I.)

This new species may be identified by the characteristic coloration and the male genital structure.

6. *Gergithus affinis* Schumacher, 1915 [Fig. 1: 12-13; Pl. 2: 13]

Schumacher, 1915 a, p. 135.

Gergithus koshunensis Matsumura, 1916, p. 102 (syn. nov.); Esaki, 1932, p. 1797, fig. 3552; Kato, 1953 b, pl. 13, fig. 10.

Aedeagus strongly recurved, in the apical half somewhat depressed, with a pair of horn-like spines arising from about the middle. Tegmina narrowly marginated with pale brown. Wings and veins as well hyaline.

Specimens examined: Many examples from Formosa (Matsumura's specimens); 1 ♂ Formosa, 1. VII, 1968, M. Tomokuni leg.

Distribution: Formosa.

7. *Gergithus longulus* Schumacher, 1915 [Pl. 2: 14]

Schumacher, 1915 a, p. 135.

Gergithus kuyanianus Matsumura, 1916, p. 103 (syn. nov.); Kato, 1933 b, pl. 13, fig. 7.

Specimens examined: 1 ex. Kuyaniya, Formosa, 25. IV, 1907, S. Matsumura leg.; 1 ex. Formosa, 29. IV, 1907, S. Matsumura leg.

Distribution: Formosa.

8. *Gergithus flaviguttatus* sp. nov. [Pl. 2: 16]

Gergithus tessellatus: Ishihara (nec Matsumura, 1916), 1965 a, p. 208.

♀, Length about 6.5 mm. Width about 5.5 mm. Body blackish brown excepting for vertex, scutellum and pronotum which are more or less reddish. Vertex three and a half times as broad as long, conspicuously hollowed between anterior and posterior margins, with lateral margins rounded and posterior margin which is carinated and of a pale yellow. Pronotum three times as long, posterior carina tinged with a pale yellow. Scutellum a little longer than vertex and pronotum put together, and rugose all over the surface. Frons reddish brown excepting for apical part which is pale, marginated narrowly with black in lateral sides, nearly as long as broad and widest near apex, with lateral margins which are almost straight and convergent toward the apex. Clypeus rounded medially, concolorous with frons. Tegmina blackish brown, with four pale brownish spots making two lines, which are, however, indistinct in a specimen, very small another spot placed on commissural margin and with a light brown stripe along the costal margin of the distal half and sparsely pubescent. Tegminal veins netted distinctly. Wings a little shorter than tegmina, slightly darkened, with veins darker. Under surface of the body brown. Legs generally brown, profemora with two obscure dark bands, apical part of mesofemora and basal part of mesotibia infuscated. Meta-tibiae subapically with two lateral spines and at apex six spines. Hind basitarsi each with nine spines at apex and second tarsal segments each with two ones. Anal segment punctulated, with long hairs.

Specimens examined: 2 ♀♀ (holotype and paratype) Rimogan~Magan, Formosa, 10. VII, 1961, T. Shirôzu leg., preserved in Ent. Lab. Coll. Agric. Ehime Univ.

Distribution: Formosa.

This new species is easily separable from others by the coloration of the tegmina.

9. *Gergithus robustus* Schumacher, 1915 [Pl. 2: 15]

Schumacher, 1915 b, p. 127.

Specimen examined: 1 ex. Hoppo, Formosa.

Distribution: Formosa.

10. *Gergithus horishanus* Matsumura, 1916 [Pl. 2: 12]

Matsumura, 1916, p. 102.

Specimens examined: 1 ex. Horisha, Formosa, 15. VII, S. Matsumura leg.; 3 exs. Horisha, Formosa, 30. IV, 1907, S. Matsumura leg.; 1 ex. Kanshirei, Formosa, S. Matsumura leg. (Matsumura's specimens in the collection of Entomological Institute, Hokkaido University)

Distribution: Formosa.

11. *Gergithus nigrolimbatus* Schumacher, 1915

Schumacher, 1915 a, p. 134.

Distribution: Formosa.

I could not examine the specimen of this species.

12. *Gergithus bistriatus* (Schumacher), 1915 [Fig. 1: 14-15; Pl. 3: 4-5]

Schumacher, 1915 a, p. 136.

Hemisphaerius bizonatus Matsumura, 1916, p. 96 (syn. nov.); Esaki, 1932, p. 1978, fig. 3554.

Gergithus bizonatus: Kato, 1933, b, pl. 13, fig. 7.

Specimens examined: 10 exs. from Formosa (Matsumura's specimens); 1 ♂ Nihonmatsu~Hokuko, Byoritsu-ken, 10. IV, 1967, T. Shirôzu leg.

Distribution: Formosa.

As shown above, *Hemisphaerius bizonatus* Matsumura is undoubtedly the present species. Lateral margins of frons rounded. Tegminal bands variable. Wings not rudimentary.

13. *Gergithus lineatus* Kato, 1933

Kato, 1933 a, p. 461, pl. 14, fig. 4; Kato, 1933 b, pl. 13, fig. 6.

Distribution: Formosa.

I could not examine the specimen of this species.

14. *Gergithus tessellatus* Matsumura, 1916 [Pl. 3: 1]

Matsumura, 1916, p. 100; Kato, 1933 b, pl. 13, fig. 9.

Specimens examined: 7 exs. from Formosa (Matsumura's specimens).

Distribution: Formosa.

15. *Gergithus reticulatus* Matsumura, 1916 [Fig. 2: 11; Pl. 3: 2]

Matsumura, 1916, p. 101; Esaki, 1932, p. 1798, fig. 3553; Kato, 1933 b, pl. 13, fig. 8.

Specimens examined: 1 ex. Shoka, Formosa, 20. VII, S. Matsumura leg. (Matsumura's specimens); 1 ♀ Pingtung Hsien Kentin Park, Formosa, 1. VII, 1968, M. Tomokuni leg.

Distribution: Formosa.

Closely related to *Gergithus tessellatus* Matsumura as it is, this is a remarkable species in the shape and also in the coloration of tegmina and frons.

16. *Gergithus stramineus* sp. nov. [Pl. 3:3]

Gergithus reticulatus: Ishihara (nec Matsumura, 1916), 1965 a, p. 208.

♀, Length 5.5 mm. Width 4.5 mm. Body generally sordid stramineous, slightly tinged with green. Vertex about two and a half times as wide as long, entirely and shallowly hollowed, with median carina obscure and posterior margin weakly rounded. Pronotum marginated with pale tint, rugose, with a weak median carina and a shallow dimple on each side of the median line. Scutellum nearly as long as vertex and pronotum put together, rugose, with the apex and margins which are paler in tinge. Frons entirely brown, rugose and a little longer than width. Clypeus concolorous with frons, weakly rounded, without median carina. Antennae dark brown. Tegmina elongate, about two times as long as broad, subhyaline and stramineous with several pale yellowish or greenish areas and fine trichia sparsely along the costal margin. Wings definitely shorter than tegmina, slightly darkened, with darker veins and marginally with fine trichia. Legs generally brown excepting for apices of femora and bases of tibiae which are irregularly infuscated. Hind basitarsi each with eight spines at apex. Anal segment pale brown excepting for apical darkened part, densely with long hairs.

Specimens examined: ♀ (holotype) Oiwake~Tattaka, Formosa, 24. VI, 1961, T. Shirôzu leg.; 2 ♀ (paratypes) Chungshan, Chiai Hsian, Formosa, 27. VI, 1968, M. Tomokuni leg. All preserved in Ent. Lab. Coll. Agric. Ehime Univ.

Distribution: Formosa.

This new species is separable from others by the elongate body and the reticulate tegmina.

Genus *Ishiharanus* gen. nov.

Type-species: *Gergithus iguchii* Matsumura, 1916.

Hemispherical, contrastingly coloured. Head including eyes narrower than thorax. Vertex concave, anterior margin not carinated. Pronotum very short, shorter than half width between eyes, medially not carinated, with the anterior margin slightly projecting about the middle and posterior margin weakly rounded. Scutellum large, four times as long as pronotum, not carinated medially. Frons smooth, definitely longer than wide, narrowest at base, with lateral margins which are divergent anteriorly, and widest subapically, and thence strongly convergent. Clypeus widest at base and convergent towards the apex, with a weak median carina. Tegmina entirely convex, sparsely pubescent along the costal margin, with distinct longitudinal veins and indistinct cross veins. Wings well developed, as long as tegmina, with distinctly netted veins. Posterior tibiae with two acute spines laterally. Eyes fairly large, about as wide as distance between eyes. Ocelli absent. Male genitalia simple in structure, with aedeagus comparatively small, which are furnished with two short spines occurring from near base.

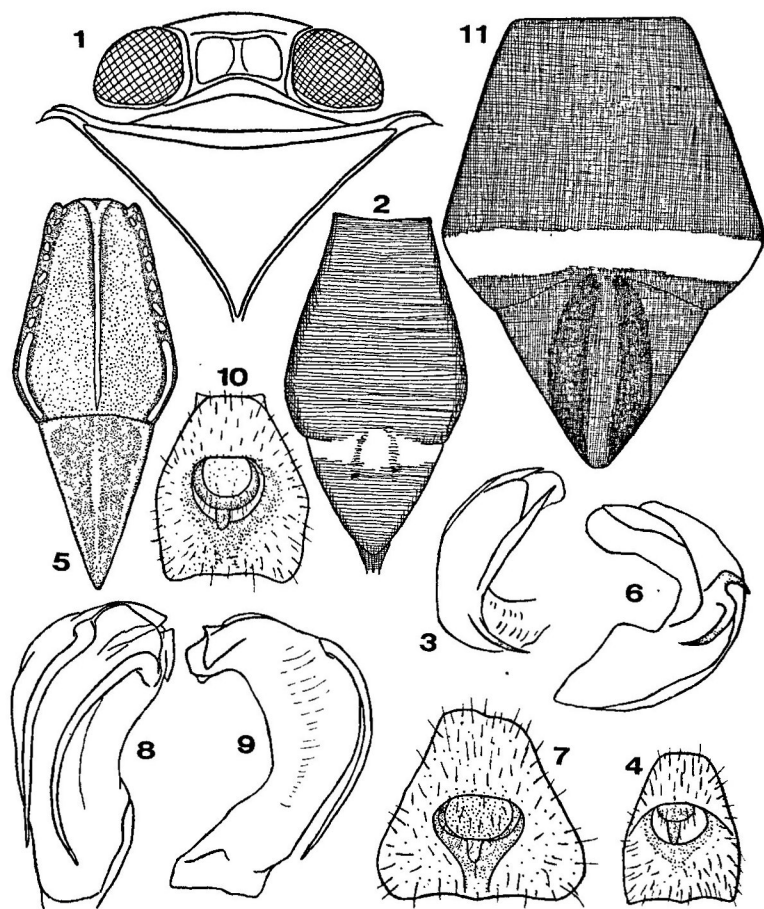


Fig. 2. 1-4, *Ishiharanus iguchii* (Matsumura); 5-7, *Gergithoides carinatifrons* Schumacher; 8-10, *Gergithus variabilis* (Butler); 11, *G. reticulatus* Matsumura; 1, Head and thorax; 2, 5 and 11, Frons; 8, Aedeagus in ventral view; 3, 6 and 9, Aedeagus in lateral view, 4, 7 and 10, Anal segment.

This new genus, which is represented by a single remarkably coloured species, seems to be situated between *Gergithus* Stål and *Hemisphaeroides* Melichar.

The generic name is dedicated to Prof. Dr. T. Ishihara.

17. *Ishiharanus iguchii* (Matsumura, 1916) comb. nov. [Fig. 2: 1-2, 3-4; Pl. 2: 6]

Matsumura, 1916, p. 98 (*Gergithus*); Esaki, 1932, p. 1797, fig. 3551 (*Gergithus*); Fennah, 1956, p. 506 (*Gergithus*); Ishihara, 1965 b, p. 131, pl. 66, fig. 8. (*Gergithus*).

Specimens examined: 1 ♀ Mt. Haigamine, Hiroshima pref., 4. XI, 1934, T. Ishihara leg.; 1 ♂ Joro pass, Kōchi pref., 9. VIII, 1934, H. Fukutomi leg.; 1 ♀ Shiraino-taki, Ehime pref., 13. XI, 1949, M. Miyatake leg.; 1 ♀ Mt. Takanawa, Ehime pref., 30. VI, 1952; T. Mohri leg.; 4 ♀♀ Izuhara, Tsushima I., Nagasaki pref., 25. VIII, 1966, S. Nomoto leg.

Distribution: Honshu, Shikoku, Tsushima I. and Southern China (Mokansan, Che Kiang Province).

Genus *Hemisphaerius* Schaum, 1850

Schaum, 1850, Allg. Enc. Wiss. Kunst. I: p. 71 and 52; Walker, 1851, List Homopt. coll. British Mus. II: p. 377; Melichar, 1903, p. 74 Distant, 1906, p. 359; Melichar, 1906, p. 67; Schumacher, 1915 a, p. 135; Schumacher, 1915 b, p. 128; Matsumura, 1916, p. 94; Fennah, 1956, p. 507. Type-species: *Issus coccinelloides* Burmeister, 1833.

Although this genus is closely related to *Gergithus* Stål, 1870, the former is different from the latter in the rudimentary wings.

The present genus is represented in the Ryukyus and Formosa by six, including a new, species which will be separated easily by the following key.

Key to the Ryukyu and Formosan species

- 1 (8) Tegmina with markings, namely stripes, bands or spots.
- 2 (3) Tegmina carmine-red with two broad greenish stripes *H. formosus* Melichar
- 3 (2) Not as above.
- 4 (7) Tegmina brownish, with two or three black bands. Frons concolorously brown.
- 5 (6) Tegmina with two blackish oblique bands subapically, though in female these bands are sometimes absent *H. tappanus* Matsumura
- 6 (5) Tegmina with three blackish bands and also with a brownish one which is connected with them *H. hoozanensis* Schumacher
- 7 (4) Tegmina blackish, with three stripes and two spots which are tinged with a greenish brown. Frons infuscated in distal half and with a yellowish or greenish band subapically *H. delectabilis* Schumacher
- 8 (1) Tegmina entirely concolorous.
- 9 (10) Frons brown, with the basal part greenish. Scutellum brown excepting for antero-apical part and median stripe which are green. Tegmina brownish, not marginated. Legs mostly brown *H. sauteri* Schmidt
- 10 (9) Frons entirely green. Scutellum concolorous with frons, without any marking. Tegmina pale green and narrowly marginated with dark tint. Legs pale brown excepting for two bands of pro- and mesotibiae and entire pro- and mesofemora which are blackish *H. takagii* sp. nov.

18. *Hemisphaerius formosus* Melichar, 1913 [Pl. 3: 12]

Melichar, 1913, p. 611.

Hemisphaerius coccinelloides var. *formosus*, Schumacher, 1915 b, p. 129; Kato, 1933 b, pl. 13, fig. 4.

Hemisphaerius coccinelloides formosus, Esaki, 1932, p. 1799, fig. 3555.

Hemisphaerius coccineus Matsumura, 1916, p. 95. (syn. nov.)

Specimens examined: 2 ♀♀ Koshun, Formosa, 9. V, 1906 and 5. VII, 1906, S. Matsumura leg.; 1 ♀ Shoka, Formosa, 20-21. VII, 1906, S. Matsumura leg.; 1 ♀ Rinkihō, Formosa, 28. IV, 1907, S. Matsumura leg.; 1 ex. Kagi, Formosa, VI, 1923, S. Matsumura leg.

Distribution: Formosa.

Although this species resembles strikingly *H. coccinelloides* Burmeister in the general appearance, it can be recognized by the two greenish stripes on each tegmen and the concolorously green frons.

19. *Hemisphaerius sauteri* Schmidt, 1910 [Pl. 3: 11]

Schmidt, 1910, p. 154; Schumacher, 1915 b, p. 128; Kato, 1933 b, pl. 13, fig. 2.

Specimen examined: 1 ♀ Shinten near Taipei, Formosa, 27. V, 1938, T. Ishihara leg.

Distribution: Formosa.

20. *Hemisphaerius takagii* sp. nov. [Fig. 1: 16-17; Pl. 3: 10]

Length ♂ 4.5 mm, ♀ about 5 mm. Width ♂ about 3.5 mm, ♀ about 4 mm. Body generally pale green, though it is somewhat sordid in the female. Vertex green, two and a half times as wide as long, with brownish posterior margin which is weakly rounded. Pronotum one and a half times as long as vertex, rounded in the anterior margin, green excepting for distal part tinged with brown, rugose, furnished with two small pits. Frons rugose, entirely green and narrowly margined with brown excepting for apical part, with the lateral margins which are divergent near apex and strongly convergent towards apex, a little wider than twice the base in the widest part. Clypeus black excepting for basal part which is concolorous with frons. Antennae brown. Eyes dark brown, marginally tinged with pale brown. Tegmina greenish, with dark brownish costal margins which are very narrow and obscure at basal part. Tegminal veins indistinct. Wings subhyaline, with veins which are simple and have no branches. Legs mostly brownish excepting for pro- and mesofemora which are darkened, with metafemora infuscated basally. Pro- and mesotibiae each with two blackish bands. Basitarsi each with ten minute spines apically. Approximate ratio of metatarsal segments I: II: III = 8: 7: 7. Aedeagus strongly recurved, without any spine. Anal segment long-oval, about twice as long as wide.

Specimens examined: 1 ♂ 1 ♀ (holotype and allotype) Sonai~Shirahama, Iriomote I., 1. VII, 1968, M. Takagi leg., preserved in Ent. Lab. Coll Agric, Ehime Univ.

Distribution: Ryukyus (Iriomote I.).

This new species resembles *H. javanensis* Melichar or *H. imiatus* Melichar but it may be identified by the characteristic coloration of legs.

The trivial name is dedicated to the collector of this valuable specimens.

21. *Hemisphaerius tappanus* Matsumura, 1916 [Pl. 3: 9]

Matsumura, 1916, p. 96; Kato, 1933 b, pl. 13, fig. 3.

Specimens examined: 1♂ 2♀ ♀ Tappan, Formosa, 24. X, 1909, S. Matsumura leg. (Matsumura's specimens).

Distribution: Formosa.

22. *Hemisphaerius hoozanensis* Schumacher, 1915

Schumacher, 1915 b, p. 128.

Distribution: Formosa.

I could not examine the specimen of this species.

23. *Hemisphaerius delectabilis* Schumacher, 1914

Schumacher, 1914, p. 14, fig. 1; Schumacher, 1915 a, p. 135, Schumacher, 1915 b, p. 128.

Distribution: Formosa.

I could not examine the specimen of this species.

Schumacher also described the following form based on a specimen of wider orange-yellowish stripes on the tegmina.

forma *alkangensis* Schumacher, 1914

Schumacher, 1914, p. 14, fig. 2; Schumacher, 1915 a, p. 136; Schumacher, 1915 b, p. 128.

Hemisphaerius sauteri Melichar (nec Schmidt, 1910), 1913, p. 611.

Genus *Mongoliana* Distant, 1909

Distant, 1909, p. 87; Fennah, 1956, p. 504.

Type-species: *Hemisphaerius chilochorides* Walker, 1851.

This genus requires to be examined in the future. Fennah reported *M. chilochorides* (Walker) from Okinawa I. and Mimasaka, Japan in 1956, but it is very doubtful. Probably it was from his misidentification for *Gergithus okinawanus* Matsumura or of *G. variabilis* (Butler).

Genus *Gergithoides* Schumacher, 1915

Schumacher, 1915 b, p. 126; Ishihara, 1965 a, p. 208.

Daruma Matsumura, 1916, p. 103.

Type-species: *Gergithoides carinatifrons* Schumacher, 1915.

24. *Gergithoides carinatifrons* Schumacher, 1915 [Fig. 2: 6-7; Pl. 3: 7-8]

Schumacher, 1915 b, p. 126; Kato, 1933 b, pl. 13, fig. 1; Ishihara, 1965 a, p. 208; Ishihara, 1965 b, p. 131, pl. 66, fig. 6.

Daruma nitobei Matsumura, 1916, p. 103.

Specimens examined: 1♂ 1♀ Urai~Agyoku, Formosa, 11. VII, 1961, T. Shirôzu leg.; 1♀ Hoshidate, Iriomote I. 8. VII, 1962, M. Satô et Y. Arita leg.; 1♂ Sonai, Iriomote I., 28. VI, 1965, Y. Hori leg.; 1♂ Mt. Omoto, Ishigaki I., 15. IV, 1962, Y. Arita leg.; 1♀ Mt. Omoto, Ishigaki I., 18. VI, 1965, K. Hatta leg.; 1♂ Yona, Okinawa I., 22. IV, 1962, Y. Arita leg.; 1♂ Yona, Okinawa I., 21. VII, K. Hatta leg.; 1♂ Cape Ashizuri, Kôchi pref., 25-26. VII, 1967, M. Miyatake, M. Iga et H. Ohnishi leg.

Distribution: Shikoku, Ryukyus (Okinawa I., Ishigaki I. and Iriomote I.) and Formosa.

Schumacher described a form, *uniformis* (Schumacher, 1915 b, p. 127), based on the material which is concolorously brownish.

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TWO SPECIES OF HOMOPTERA, UNRECORDED FROM SHIKOKU, JAPAN

By Yoshihiro Hori

In 1967, I could capture the following two species of Homoptera, which had been unrecorded from Shikoku.

1. *Zoraida kuwayamae* (Matsumura, 1913) (Family Derbidae)

Matsumura, 1913, 1000 Ins. Jap. 1: 63, pl. 8, fig. 13. (*Thracia*, Hokkaido: Sapporo); Matsumura, 1914, Ann. Mus. Nat. Hungarici 8: 303 (Sapporo); Matsumura, 1931, 6000 Ill. Ins. Jap. 1293, fig. 458 (*Thracia*); Esaki, 1932, Iconogr. Ins. Jap. 1791, fig. 3540.

Specimen examined: 1 ♀ Masagoya, Odamiyama, Ehime pref., 26. VII, 1967, Y. Hori leg.

Distribution: Hokkaido, Honshu and Shikoku (hab. nov.).

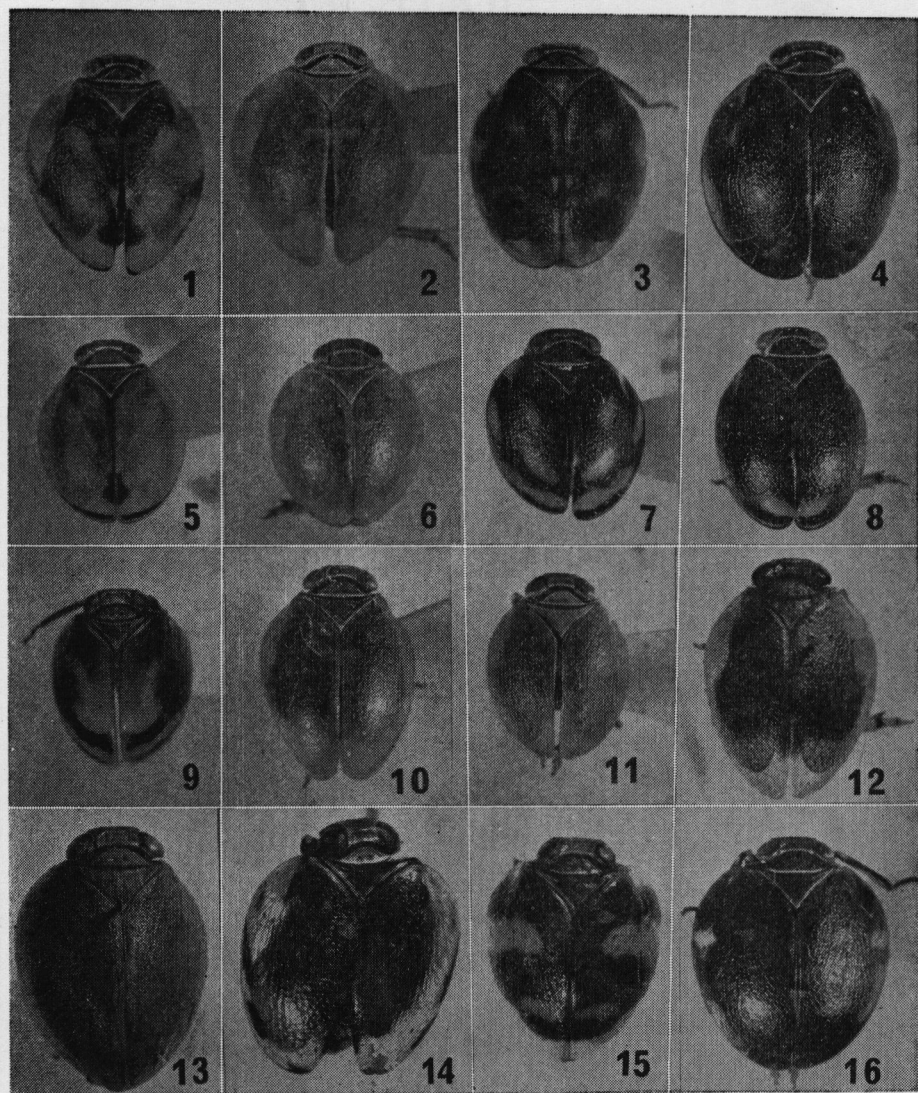
2. *Oncopsis juglans* (Matsumura, 1912) (Family Macropsidae)

Matsumura, 1912, Jour. Coll. Agr. Tohoku Imp. Univ. 4: 304 (*Bythoscopus*, Honshu and Hokkaido); Matsumura, 1916, App. Ent. 1: 408 (*Bythoscopus*); Matsumura, 1920, Manual Jap. Inj. Ins., n. ed. 1: 327 (*Bythoscopus*); Takahashi, 1930, Treat. Orchard Ins. 2: 1058 (*Bythoscopus*); Matsumura, 1931, 6000 Ill. Ins. Jap. 1251, fig. 346 (*Bythoscopus*); Matsumura, 1932, Consp. Jap. Inj. Ins. 278, pl. 11, fig. 6 (*Bythoscopus*); Watanabe, 1937, List Tree Ins. Jap. 111 (*Bythoscopus*); Murakoshi, Ill. Ins. 310, fig. 22 (*Bythoscopus*); Ishihara, 1953, Sci. Rep. Matsuyama Agric. Coll. 11: 21; Esaki et Ito, 1954, Tent. Cat. Jassoidea Jap. 266; Ishihara, 1965 Iconogr. Ins. Jap. col. nat. ed. 3: 119, fig. 1; Metcalf, 1966, Gen. Cat. Hom. 6 (13): 220.

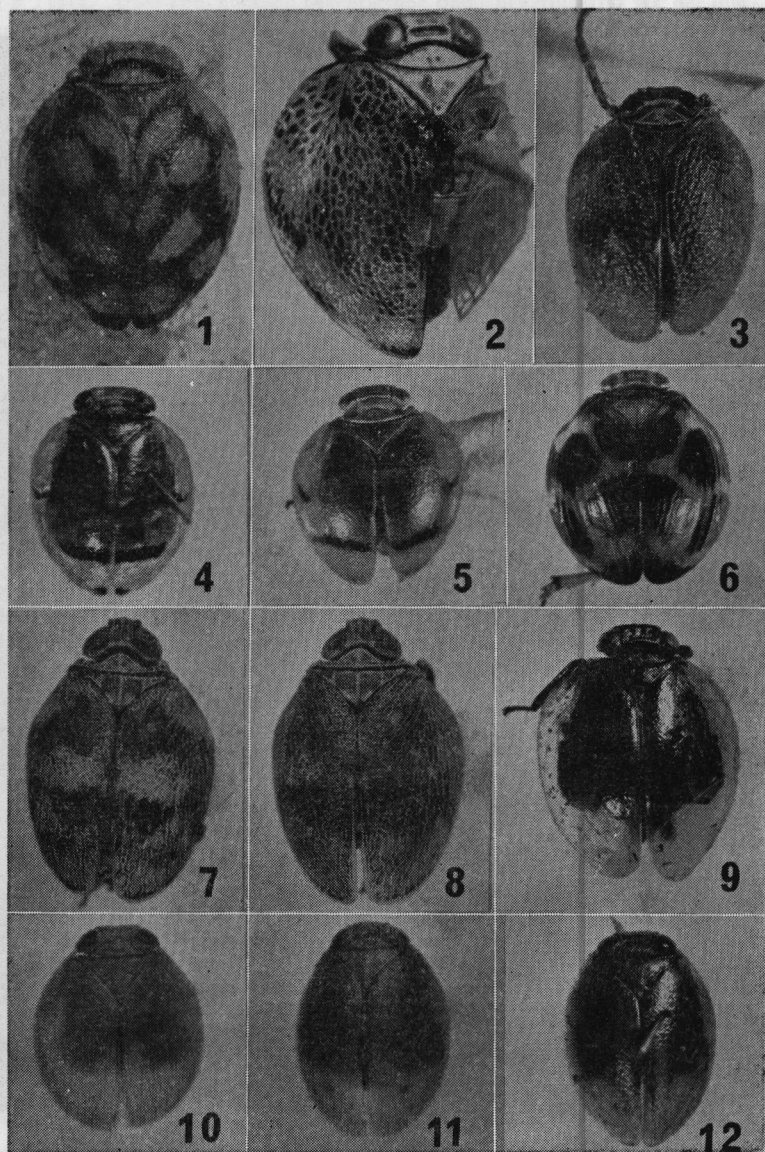
Specimen examined: 1 ♂ Gomyo near Matsuyama, Ehime pref., 13. VII, 1967, Y. Hori leg.

Distribution: Hokkaido, Honshu and Shikoku (hab. nov.).

This species was found on a leaf of the Walnut-tree (*Juglans mandshrica* Maxim. var. *Sieboldiana* Makino).



1-4, *Gergithus variabilis* (Butler); 5-8, *G. satsumensis* Matsumura; 9, *G. taiwanensis* sp. nov. (type-specimen); 10, *G. okinawanus* Matsumura; 11, *G. yayeyamensis* sp. nov. (type-specimen); 12, *G. horishanus* Matsumura (type-specimen); 13, *G. affinis* Schumacher; 14, *G. longulus* Schumacher; 15, *G. robustus* Schumacher; 16, *G. flaviguttatus* sp. nov. (type-specimen).



1, *Gergithus tessellatus* Matsumura (type-specimen); 2, *G. reticulatus* Matsumura (type-specimen); 3, *G. stramineus* sp. nov. (type-specimen); 4 and 5, *G. bistriatus* (Schumacher) 6, *Ishiharanus iguchii* (Matsumura); 7 and 8, *Gergithoides carinatifrons* Schumacher; 9, *Hemisphaerius tappanus* Matsumura (type-specimen); 10, *H. takagii* sp. nov. (type-specimen); 11, *H. sautevi* Schumidt; 12, *H. formosus* Melichar.