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A REVISION OF THE TRIBE CHILOCORINI OF JAPAN AND THE LOOCHOOS* (Coleoptera: Coccinellidae)

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Up to the present three species of the tribe Chilocorini have been recorded from Japan. In this paper the author revises the tribe Chilocorini and describes three new forms from Japan and the Loochoos, which may be regarded as the beneficial Coccinellidae attacking scale insects.

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The tribe Chilocorini is easily separated from the other tribes of the Coccinellidae by the following characters:

(1) Clypeus extending to underside of eyes. (2) Upper surface of body glabrous except a few exotic species. (3) Antennae very short, with 8 or 9 segments. (4) Body hemispherical, strongly convex and medium in size. (5) Epipleurae of the elytra wide and inclined.

In this tribe only one genus, *Chilocorus* Leach, is distributed in Japan and the Loochoos.

Genus **Chilocorus** Leach, 1815

This genus is distinguished from the others of the tribe by the following points: Frontal margin of clypeus strongly waved; antennae with 8 segments; femoral lines of first abdominal sternum incomplete, touching the posterior margin.

Key to the *Chilocorus*-species of Japan and the Loochoos

1 (4) Underside reddish; elytra completely black or with indistinct red marking. Scutellum elongate triangular; lateral margins of pronotum somewhat straight.

Male genitalia: tegmen asymmetrical; apex of sipho smooth.

2 (3) Each elytron black with a longitudinal and large indistinct red marking beside elytral suture, or elytra reddish with blackish circumference; head, pronotum, mouth parts and legs black or pitchy black. Anterior margin of prosternum more or less arched forward, prosternal process relatively long. Epipleurae wider.

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Male genitalia as shown in fig. 1:2.

Body length: 5.8–7.2 mm. ……1. *Ch. rubidus* Hope

3 (2) Elytra completely black without any marking; pronotum black with the reddish latero-anterior margins; head, mouth parts, underside of thorax, abdomen and legs reddish. Anterior margin of prosternum flat. Epipleurae of elytra relatively narrower.

Head punctate very strongly and closely, vertex shagreened. Pronotum punctate somewhat strongly and closely. Punctures on each side of pronotum more or less stronger than those on middle. Scutellum finely punctate. Punctation on elytra as strong as those on pronotum, but marginal part of elytra more strongly punctate.

Male genitalia: very characteristic as shown in fig. 1:3; tegmen long, the opening of the groove of median piece for the reception of sipho being at the right side in dorsal aspect. Sipho strongly curved.

Body length: 3.9–4.1 mm. ……2. *Ch. mikado* Lewis

4 (1) Underside of thorax black; head, pronotum and legs black; elytron black with a distinct marking. Scutellum nearly regularly triangular; lateral margins of pronotum rounded.

Male genitalia: tegmen almost symmetrical; apex of sipho waving.

5 (6) Head with strong and very close but not deep setigerous punctures; interspace between the punctures on frons and vertex shagreened. Punctation on the lateral part of pronotum weaker than the next three species. Basisternum of prothorax scarcely punctate. Scutellum flat, with fine punctures. Elytral marking very small, transverse or sometimes rounded.

Male genitalia: median piece of tegmen shorter than the lateral lobes.

Body length: 3.5–4.8 mm. ……3. *Ch. kuwanae* Silvestri

6 (5) Head punctate more strongly and deeply. Interspace between punctures on frons and vertex smooth and shining. Basisternum of prothorax punctate sparsely but clearly. Elytral marking relatively large.

Male genitalia: median piece of tegmen nearly equal to lateral lobes in length.

7 (10) Head with extremely strong and relatively close punctures. Anterior marginated line of pronotum not disappeared at middle. Lateral part of pronotum more strongly punctate, and with shagreened part. Elytral marking usually large.

Male genitalia: lateral lobes of tegmen more or less clavate.

8 (9) Head irregularly punctate, punctures on each side of clypeus below eye very large. Punctation on the lateral part of pronotum not very strong, indistinct on the shagreened part which is relatively narrower. Elytral marking large and round. Scutellum distinctly depressed.

Male genitalia: lateral lobes of tegmen weakly narrowed toward the base in lateral aspect.

Body length: 3.2–3.8 mm. ……4. *Ch. esakii* sp. nov.

9 (8) Punctation on head usually regular but sometimes irregular. Punctation on the lateral part of pronotum very strong, mored istinct on the shagreened part which is rather wider. Scutellum flat or very weakly depressed. Elytral marking transverse.

Male genitalia: lateral lobes of tegmen strongly narrowed toward the base in lateral aspect.

Body length: 3.5–4.0 mm.....5. *Ch. amamensis* sp. nov.

10 (7) Head with strong and relatively sparse punctures; interspace between punctures convex. Anterior marginated line of prothrax disappeared at middle. Lateral part of pronotum with relatively fine punctures and without a shagreened part. Elytral marking relatively small and transverse.

Male genitalia: lateral lobes of tegmen subparallel in lateral aspect.

Body length: 2.7–3.7 mm. ..... 6. *Ch. ishigakensis* sp. nov.

1. Chilocorus rubidus Hope, 1831

Chilocorus rubidus Hope (1831): in Gray, Zool. Misc.: 31; Lewis (1896): Ann. Mag. nat. Hist., London (6) 17: 31 (Nagasaki et Yokohama); Matsumura (1931); Yuasa (1932); Mader (1955); etc.

Chilocorus tristis Faldermann (1835): Mem. Acad. Pétersberg 2: 452; Lewis (1873): Ent. mon. Mag., London 10: 56 (Japan); Crotch (1874); Nawa (1899); Matsumura (1907); Kurisaki (1921); etc.

Habitat: Japan (Hokkaido, Honshu, Shikoku and Kyushu), Siberia, Manchuria, Korea, Mongolia, China, Napal, India, Celebes and Australia.

2. Chilocorus mikado Lewis, 1896

Chilocorus mikado Lewis (1896): Ann. Mag. nat. Hist., London (6) 17: 32 (Nagasaki); Kurisaki (1921): Ins. World, Gifu 25 (282): 39; Mader (1955): Ent. Arb. Mus. Frey, München 6 (3): 738.

Chilocorus nigritus Lewis (nec Fabricius, 1798) (1873): Ent. mon. Mag., London 10: 56 (Nagasaki); Crotch (1874): Revis. Cocc.: 184 (Japan) (partim).

Habitat: Japan (Kyushu).

This species was described by Lewis (1896) from Nagasaki in Kyushu and no locality has been added thereafter. The author has examined the following specimens:

Takachiho-no-mine, Mt. Kirishima, Southern Kyushu, 2♂♂: 17. vii. 1933; 1♀: 22. vii. 1933 (H. Hori & M. Fujino leg.) in the Collection of the Entomological Laboratory, Kyushu University; 1♀: 22. iv. 1958; 1♂: 14. v. 1958; 1♀: 13. vii. 1958 (H. Maebara leg.) in the author's collection.

3. Chilocorus kuwanae Silvestri, 1909

Chilocorus kuwanae Silvestri (1909): Revista Col. Ital. 7: 126 (Japan); Yuasa (1932): Iconog. Ins. Japan.: 690, f. 1354; Mader (1955); etc.

Chilocorus similis Lewis (nec Rossi, 1790) (1896): Ann. Mag. nat. Hist., London (6) 17: 31 (Yokohama); Nawa (1899); Kurisaki (1921); etc.

Chilocorus similis Rossi var. *Japonicus* Sicard (nec Weise) (1907): Bull. Mus. nat. Hist., Paris 1907: 211 (Tokio) (nomen nudum).

Chilocorus renipustulatus Lewis (nec Scriba, 1792) (1873): Ent. mon. Mag., London 10: 56 (Japan); Crotch (1874): Revis. Cocc.: 185 (Japan) (partim); etc.

This species is very similar to *renipustulatus* Scriba from Europe and *similis* Rossi from Italy but distinguished from them by the punctation on the head and the form of the scutellum.

Although Sicard (1907) recorded this form under the name *Chilocorus similis* Ross. var. *Japonicus* Weise without its description, this name is invalid.

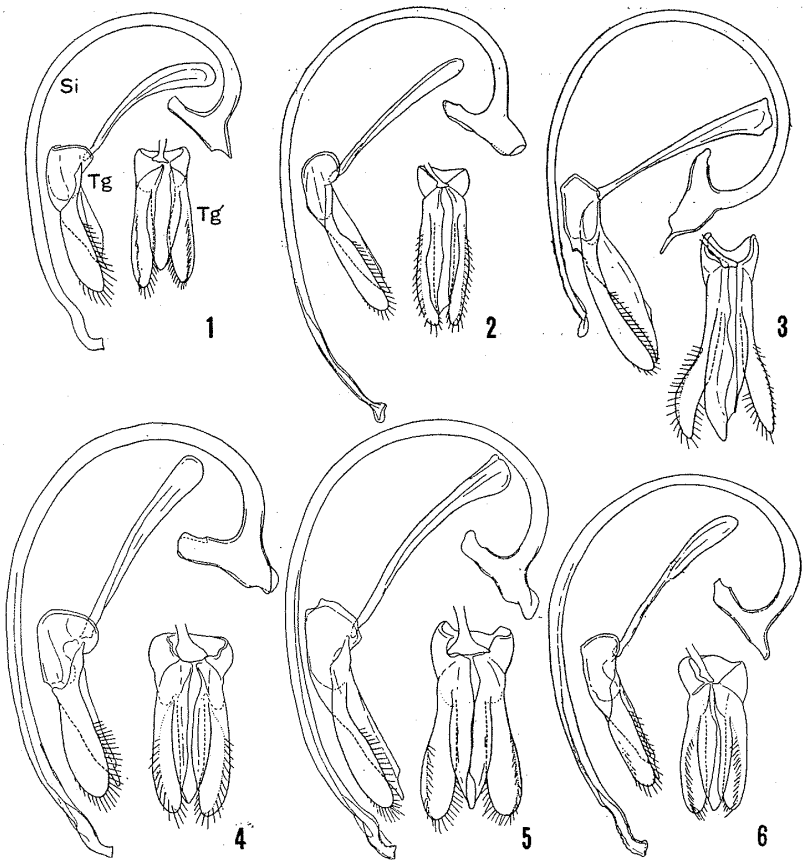


Fig. 1. Male genitalia of Japanese *Chilocorus*.

1. *kuwanae* Silvestri, 2. *rubidus* Hope, 3. *mikado* Lewis, 5. *esakii* sp. nov., 5. *amamensis* sp. nov., 6. *ishigakensis* sp. nov.

Si: Sipho, lateral aspect, Tg: Tegmen, lateral aspect, Tg': Tegmen, dorsal aspect.

On the other hand, all the specimens which were recorded from Japan by Lewis (1873, 1896), Crotch (1874) and many Japanese entomologists under the name, *similis* or *renipustulatus*, may be the present species, *kuwanae*.

Habitat: Japan (Hokkaido, Honshu, Shikoku, Kyushu, Amakusa and Tsushima: new record), Saghalien (new record: Toyohara, 25. vii. 1922, T. Esaki leg.) and China.

4. Chilocorus esakii H. Kamiya, sp. nov.

Body hemispherical, convex, shining. Black; antennae yellow, mouth parts pitchy black, abdominal sternites yellow, median part of the first segment of abdomen blackish; each elytron with a large, round, red marking, diameter of the elytral marking being about half as wide as elytron.

Head not shagreened but shining, punctate strongly and somewhat closely,

but punctation on head rather irregular, punctures on vertex weaker than those on frons, punctures on clypeus the strongest, with short hairs, but each side below eye smooth. Frons between eyes convex and narrowed, marginated clearly. Terminal segment of maxillary palpus nearly cylindrical, pointed.

Pronotum subpentagonal, anterior margin weakly arched forward at middle, extended laterally and inclined, lateral margin rounded; anterior margin of pronotum clearly marginated, but weakly at middle; pronotum punctate finely and somewhat closely, on lateral part very strongly; the lateral part narrowly shagreened and the punctures on this part indistinct.

Scutellum regular triangular, without punctures, moderately depressed.

Elytra stronglyconvex, punctate more strongly and more sparsely than pronotum, at lateral parts of elytra punctate very strongly.

Basisternum of prothorax punctate somewhat strongly and very sparsely; prosternal process relatively wide with very strong punctures.

Femoral line of first abdominal sternum reaching the lateral margin; first abdominal sternum punctate very clearly and sparsely at middle.

Male genitalia: tegmen rather stout, median piece of tegmen scarcely shorter than the lateral lobes of tegmen; lateral lobes clavate, weakly narrowed basally sipho fish-hook-shaped, rather slender; apex of the sipho less strongly waved.

Body length: 3.2–3.8 mm.

Habitat: Japan (Southern Kyushu).

Holotype: ♂: Cape Sata, Ohsumi Peninsula, Kagoshima Prefecture, Kyushu, 25. vi. 1957 (H. Kamiya leg.) in the Collection of the Entomological Laboratory, Kyushu University.

Paratopotypes: 1♂ 1♀: 8. x. 1956 (T. Hidaka leg.); 1♀: 8. x. 1956 (H. Kuroko & Hirotsu leg.); 1♂ 2♀ ♀: 25. vi. 1957 (H. Kamiya leg.); 1♀: 29. v. 1958 (J. Nagao leg.) in the author's collection.

5. Chilocorus amamensis H. Kamiya, sp. nov.

Very similar to *esakii* m. but differing from it in the following characters.

1. Red elytral marking transverse and arched.
2. Scutellum flat or very weakly depressed.
3. Punctation on head rather close, usually regular, sometimes irregular as in *esakii*; punctures on each side of clypeus below eye a little larger than those on frons.
4. Lateral part of pronotum punctate more strongly, shagreened part wider; punctures on shagreened part distinct and very strong.
5. Male genitalia: basal half of sipho curved more strongly, siphonal capsule longer than that of *esakii* Tegmen relatively long and slender; lateral lobes of tegmen as long as the median piece of tegmen, more strongly narrowed toward the base than in *esakii* in lateral aspect.

Body length: 3.5–4.0 mm.

Habitat: The Loochoos (Amami Ialands).

Holotype: ♂: Okinoerabu Is., Amami Islands, 23. iii. 1957 (M. Umebayashi leg.) in the Collection of the Entomological Laboratory, Kyushu University.

Paratopotypes: 2♂ ♂: 23. iii. 1957; 2♂ ♂ 1♀: 31. iii. 1957; 1♀: 22. iii. 1957; 1♀: 2. vii. 1957 (M. Umebayashi leg.) in the author's collection.

Paratype: 1♂: Naze, Amami-Ohshima, 19. vii. 1954 (S. Miyamoto & Y. Hirashima leg.) in the Collection of the Entomological Laboratory, Kyushu University.

6. Chilocorus ishigakensis H. Kamiya, sp. nov.

Also very similar to *esakii* m. and *amamensis* m. but differing from them in the following characters.

1. Red elytral marking transverse as *amamensis* but usually smaller, about one-third as wide as elytron.
2. Scutellum flat, with a few fine punctures.
3. Head punctate relatively sparsely and strongly but less than the other two species; interspace between punctures on frons not flat but convex, and not shagreened.
4. Lateral part of clypeus encroached on eyes more strongly.
5. Anterior marginated line of pronotum obsolete at middle.
6. Lateral part of pronotum with relatively weak punctures, without shagreened part.
7. Punctation on the basisternum of prothorax relatively weak.
8. Elytra punctate more or less strongly than pronotum.
9. Terminal segment of the maxillary palpus more cylindrical and not pointed.
10. Male genitalia: sipho curved more strongly than *amamensis*; leteral lobes of tegmen straight and parallel in lateral aspect.

Body length: 2.7–3.7 mm.

Habitat: The Loochoos (Yaeyama Group and Okinawa?).

Holotype: ♂: Ishigaki-jima Is., Yaeyama Group, Loochoos, 2. vi. 1934(C. Senaha leg.).

Paratopotypes: 1♂ 4♀♀: 2. vi. 1934 (C. Senaha leg.).

Paratype: 1♂: Ohara, Iriomote Is., Yaeyama Group, Loochoos, 25. viii. 1958 (T. Hidaka leg.).

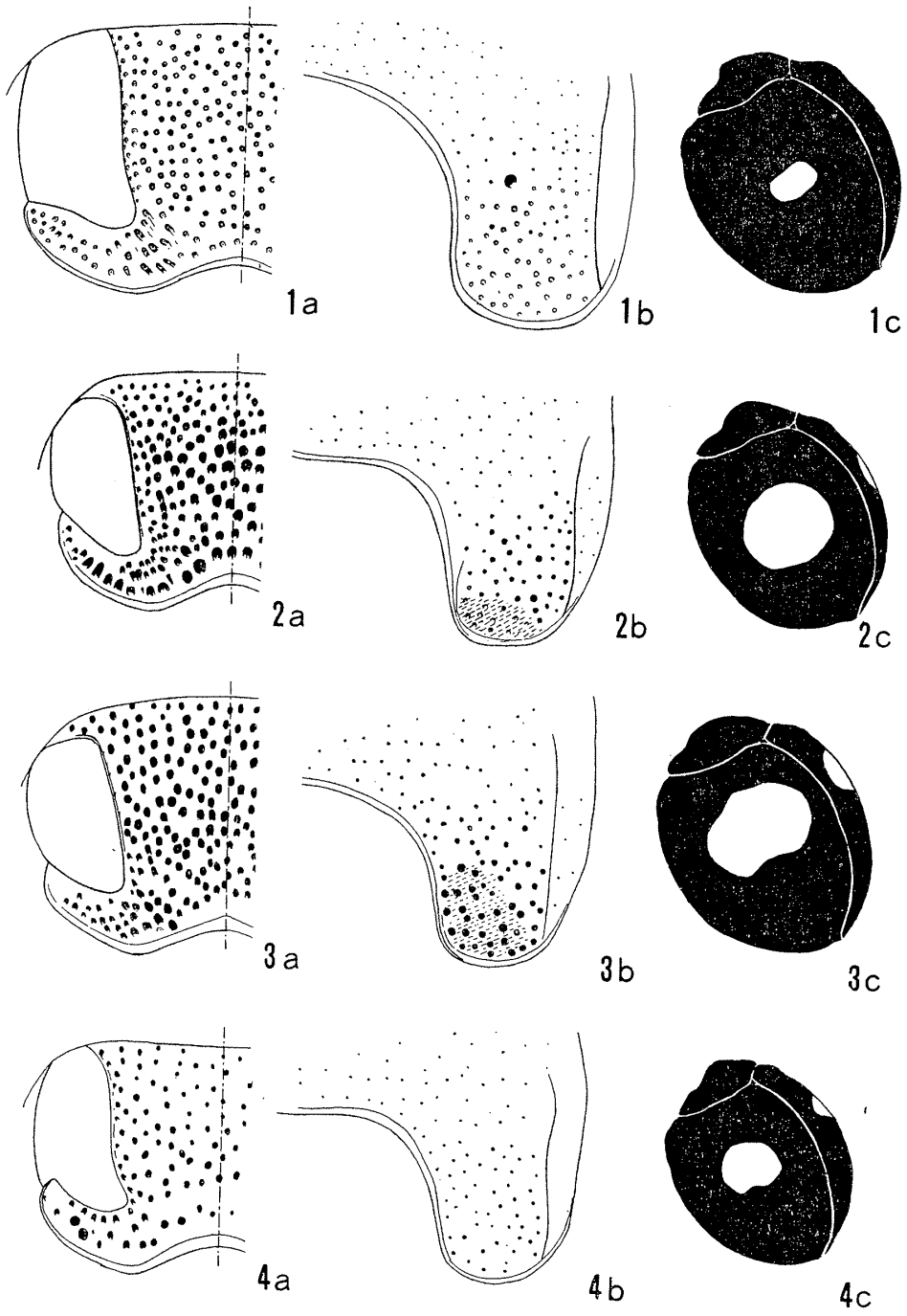
Holotype, paratopotypes and paratype are preserved in the Collection of the Entomological Laboratory, Kyushu University.

The author has examined a unique female specimen from Okinawa which may be determined to this species.

Explanation of Plate 9

1. *Chilocorus kuwanae* Silvestri.
2. *Ch. esakii* sp. nov.
3. *Ch. amamensis* sp. nov.
4. *Ch. ishigakensis* sp. nov.

a. Head, frontal aspect. b. Lateral part of pronotum, latero-frontal aspect, showing punctation and shagreened part, c. Outline of the body, showing the elytral markings, in full aspect.



The Chilocorini of Japan and the Loochoos