Jpn. J. Ent., **65**(4): 728–744. December 25, 1997

Revision of the Mirine Genus *Creontiades* DISTANT and Allies from Japan (Heteroptera, Miridae) Part II: Species of *Orientomiris*, n. gen.

Tomohide YASUNAGA

Biological Laboratory, Hokkaido University of Education, Ainosato 5–3–1, Sapporo, 002 Japan

Abstract A new mirine genus, *Orientomiris*, is proposed to accommodate *Calocoris tricolor* SCOTT, 1880, and other mirines. Four new species of the genus found in the Ryukyus, *O. nigripennis*, *O. erythromelas*, *O. flavicollaris* and *O. yaeyamanus*, are diagnosed and described. A new subspecies of *yaeyamanus* is also described. *Creontiades eurytus* is transferred to *Orientomiris*, diagnosed and figured. The zoogeography and phylogeny of the Japanese species of *Orientomiris* are discussed.

Key words: revision; *Creontiades* and allies; new genus; new species; new subspecies; new combinations.

Orientomiris YASUNAGA, n. gen.

Type species: *Calocoris tricolor* SCOTT, 1880.

Diagnosis. Recognized by the elongate body, dark general coloration, sparse and silky dorsal pubescence, smooth frons, long antenna that is longer than the body, impunctate but transversely rugose pronotum with a narrow, shagreened collar, subshining and pruinose mesoscutum, arched scutellum, long leg, and prominent tibial spines.

Description. Body large, elongate, subparallel-sided, 7.0–11.0 mm in length; dorsal surface dark brown to fuscous, sparsely and uniformly clothed with silky pubescence. Head oblique, with sparse pubescence; eye removed from pronotal collar; frons almost smooth; vertex with a longitudinal, mesal sulcus terminated before neck. Antenna longer than body; segment I slightly longer than IV; segment II almost linear; segment III longer than basal width of pronotum, about twice as long as IV. Rostrum long, usually exceeding hind coxa.

Pronotum subshining, impunctate, transversely rugose except on shiny callus, with sparse, silky, suberect pubescence, lateral margin not carinate; collar shagreened, narrower than any antennal segments; mesoscutum subshining, with grayish brown pollinosity; scutellum subshining, rather arched, transversely rugose, with sparse, silky, suberect pubescence; thoracic pleurite widely

pruinose or shagreened, with light colored ostiolar peritreme. Hemelytra subshining, weakly shagreened, uniformly clothed with silky, recumbent pubescence. Legs long; tibial spines dark, prominent; hind tarsomere III longer than I or II.

Male genitalia: Genital segment usually with a spine at base of left paramere. Vesica rather symmetrical in form, divided into many complicated lobules, with a rounded, spinulate sclerite distal to gonopore (median spinulate sclerite: MS in figures) and with two apicolateral sclerites (left lateral and right lateral sclerites: LS & RS); gonopore crescent-shaped, rather large, thick-rimmed.

Female genitalia: Sclerotized rings enlarged, thin-rimmed, somewhat separated mesally; posterior wall of bursa copulatrix with rather distinct dorsal structure and interramal lobes.

Discussion. The type species and some relatives of this new genus have been placed in *Creontiades* or *Megacoelum*, but are distinguished from members of these genera by the large, fuscous body, three distinct sclerites on the vesica, and enlarged and thin-rimmed sclerotized ring. The three vesical sclerites (Figs. 2–4, 5, 7, MS+LS+RS) are considered to be an autapomorphy for the new genus. *Orientomiris* is easily distinguished from *Creontiades* by the characters mentioned in the generic diagnosis. Its closest relative appears to be *Megacoelum*, from which it can be distinguished by the more elongate body, median spinulate sclerite on the vesica, enlarged and thin-rimmed sclerotized ring, and narrowed interramal lobe of the bursae. The diagnostic characters of *Megacoelum* will be discussed in Part III.

It seems that the members of *Orientomiris* are principally associated with broadleaf host plants, and that they have one generation per year.

Orientomiris tricolor (SCOTT), n. comb.

(Figs. 1, A; 2)

Calocoris tricolor SCOTT, 1880, Trans. R. ent. Soc. Lond., **1880**: 313; CARVALHO, 1959, Arq. Mus. nac., Rio de Janeiro, **48**: 49.

Megacoelum tricolor: HASEGAWA, 1960, Bull. Nagaoka municip. Sci. Mus., (1): 50.

Creontiades tricolor: LINNAVUORI, 1963, Annl. ent. fenn., **29**: 75; MIYAMOTO, 1977, *in* Fn. & Fl. Tsushima Is., p. 320; YASUNAGA, 1988, Kontyû, Tokyo, **56**: 477; KERZHNER, 1972, Trudy zool. Inst. Akad. Nauk SSSR, **52**: 282; 1978, Trudy biol.-pochvenn. Inst., Vladivost., (n.s.), **50**: 41; 1988, Opredel. Nasek. dal'n. vost. SSSR, **2**: 815; ICHITA, 1988, Celastrina, (20): 134; MIYAMOTO & YASUNAGA, 1989, *in* Check List Jpn. Ins., **1**: 159; YASUNAGA *et al.*, 1990, in Fn. & Fl. Nagasaki Pref., p. 227; YASUNAGA *et al.*, 1993, Field Guide to Jpn. Bugs, p. 159, pl. 19; SCHUH, 1995, Plant Bugs of the World, p. 748.

Diagnosis. Easily recognized by the elongate body, dark reddish brown to

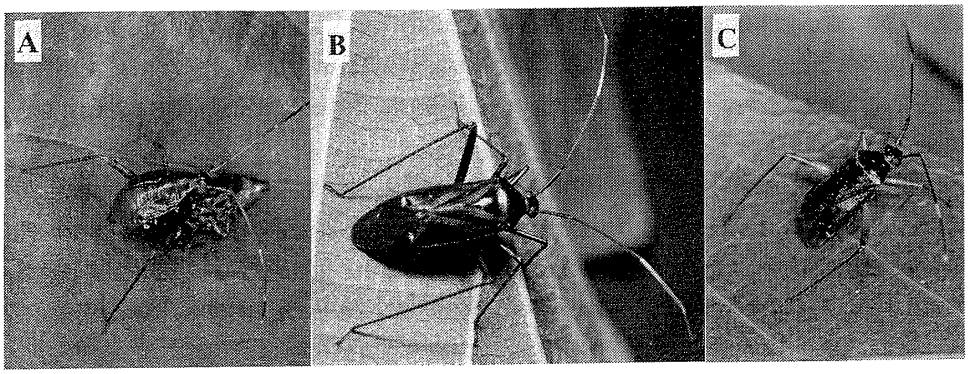

Fig. 1. A, Last-instar nymph of *Orientomiris tricolor* feeding on an aphrophorid in the laboratory; B, female adult of *O. eurytus* attracted to light at Monobe Vil., Kochi Pref. (photographed by Mr. M. TAKAI); C, female adult of *O. flavicollaris* on the host plant, *Schima wallichii*, at Kunigami Vil., Okinawa Is.

fuscous dorsum, long antenna and leg, and somewhat pale femora.

Redescription. Body large, elongate, subparallel-sided; dorsal surface variable in color, reddish brown to fuscous, covered with short, suberect pubescence. Head chestnut brown to dark brown, somewhat granulate, rather oblique, with sparse, suberect, short pubescence; vertex with a longitudinal, mesal sulcation which is terminated before neck. Antenna dark brown; segment I, basal 2/3–3/4 of II and basal 1/3 of III reddish brown; length of segments I–IV (♂/♀): 1.37–1.50/1.48–1.51, 3.40–3.75/3.62–3.75, 2.52–2.75/2.75–2.98, 1.27–1.40/1.31–1.35. Rostrum dark chestnut brown, shining, somewhat tinged with red, somewhat exceeding hind coxa; length of segments I–IV (♂/♀): 0.97–1.00/1.10–1.13, 0.92–0.95/1.00–1.10, 0.75–0.80/0.80–0.83, 1.02–1.15/1.12–1.18.

Pronotum almost unicolorous, reddish brown to blackish brown, shallowly and transversely rugose, sparsely with silky, suberect, short pubescence; mesoscutum fuscous, pruinose; scutellum fuscous, somewhat arched, transversely rugose, with sparse, silky pubescence; thoracic side somewhat paler; ostiolar peritreme yellowish brown. Hemelytra chestnut brown to fuscous, widely reddish or yellowish in teneral specimens, uniformly clothed with silky, suberect, short pubescence; membrane dark grayish brown, with dark brown veins. Legs long, dark; femur usually dark reddish brown, sometimes widely yellowish brown or pale reddish brown; tibia chestnut brown or yellowish brown, with prominent dark spines; tarsus pale brown or chestnut brown; apical part of tarsomere III infuscate; length of hind femur, tibia and tarsus (♂/♀): 3.75/3.50–3.85, 5.50-6.10/5.75–6.50, 0.82-0.85/0.80–0.93; that of hind tarsomeres I–III (♂/♀): 0.26–0.27/0.25–0.32, 0.37–0.38/0.35–0.38, 0.37–0.44/0.38–0.44. Abdomen shiny dark brown; genital segments paler.

Male genitalia (Fig. 2, A–E): Parameres as in figures (B–C); left paramere

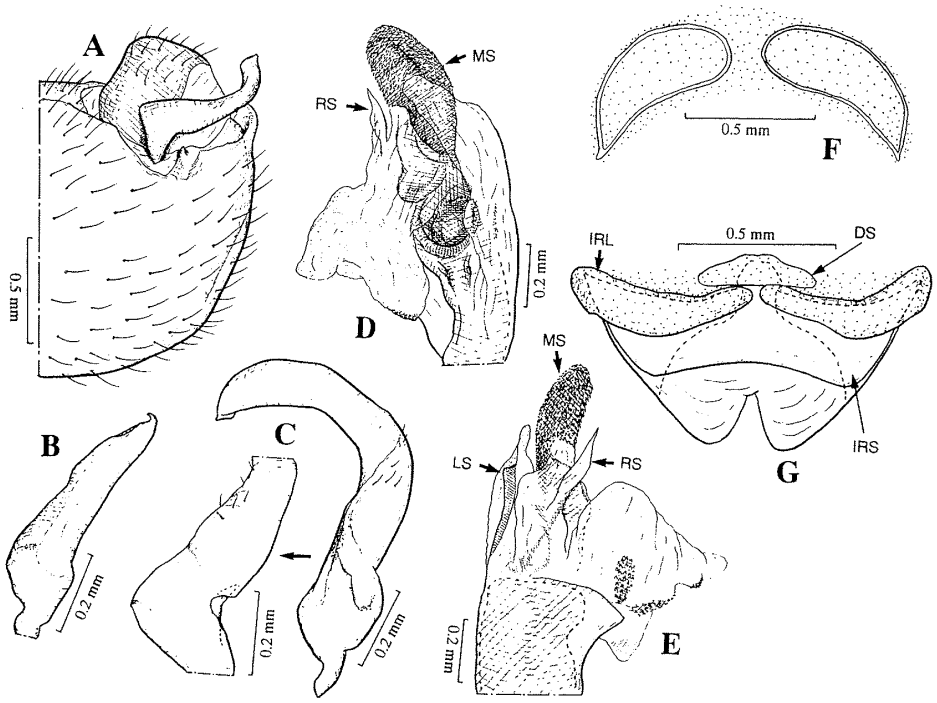

Fig. 2. Male (A–E) and female (F–G) genitalia of *Orientomiris tricolor*. A, Genital segment in left lateral view; B, right paramere; C, left paramere; D, vesica in dorsal view; E, ditto in ventral view; F, sclerotized rings; G, posterior wall of bursa copulatrix. Abbreviations: DS=dorsal structure, IRL=interramal lobe, IRS=interramal sclerite, LS=left lateral sclerite, MS=median spinulate sclerite, RS=right lateral sclerite.

provided with several, short sensory setae. Vesica with enlarged MS; LS keel-like, not extending apically; RS pointed at apex, not strongly sclerotized (D–E).

Female genitalia (F–G): Sclerotized rings elongate oval, narrow rimmed (F); posterior wall of bursa copulatrix with rather wide and somewhat flattened dorsal structure; interramal lobes relatively narrow (G).

Dimensions. ♂/♀: Body length 7.40–8.50/8.10–9.90; head width including eyes 1.31–1.43/1.48–1.52; vertex width 0.46–0.50/0.50–0.55; rostral length 3.52–3.78/3.67–4.03; mesal pronotal length including collar 1.37–1.70/1.47–1.68; basal pronotal width 2.35–2.75/2.50–2.83; maximum width across hemelytra 2.87–3.08/2.77–3.44.

Specimens examined. 1♀, Japan (LEWIS), DISTANT Coll., 1911–383, without other detailed data, det. as '*tricolor*' (probably by DISTANT) (NHML). Hokkaido: 5♂17♀, Oniwaki, Rishiri Is., Soya, on *Salix spp*., 28–29. vii. 1994, T. YASUNAGA & Y. TODO (HUES); 1♂, Kafukai, Rebun Is., Soya, on *Salix* sp., 30–31. vii. 1994, T. YASUNAGA (HUES); 1♂3♀, Moshiri-Shirakaba, Horokanai T., Kamikawa, on *Salix* spp., 2–7. viii. 1994, Y. TODO (HUES); 8♂2♀, same locality and date, on flowers of *Kalopanax pictus*, T. YASUNAGA

(HUES); 2♂9♀, Mt. Asahidake, 200–800 m alt., Mts. Taisetsu, Kamikawa, on *Salix* spp., 7–11. viii. 1994, T. YASUNAGA & Y. TODO (HUES); 1♂, Tenninkyo Valley, Mts. Taisetsu, on *Salix* sp., 11. viii. 1994, Y. TODO (HUES); 2♀, Shiretoko Peninsula, Mt. On'nebetsu, Shari T., Abashiri, on *Salix* sp., 31. viii–1. ix., 1995, Y. TODO (HUES); 1♀, same locality and data, on *Polygonum sachalinense*, T. YASUNAGA (HUES); 1♀, same locality and date, on *Artemisia* sp., M. OGAWA (HUES); 2♂1♀, Miyama-Kitoushi, Kushiro, on *Salix* spp., 29. viii. 1995, Y. TODO (HUES); 2♂, Washippu, Ashoro T., Tokachi, on *Salix* spp., 22. viii. 1995, Y. TODO (HUES); 8♀, Rakko Riv., Hiroo T., Tokachi, on *Salix* spp., T. YASUNAGA & Y. TODO (HUES); 1♀, Kimonto, Churui Vl., Tokachi, on *Salix* sp., 21. viii. 1995, T. YASUNAGA (HUES); 1♂, same locality and plant, 27. viii. 1995, Y. TODO (HUES); 1♂3♀, Aoyama, Tobetsu T., Ishikari, on flowers of *Tilia* sp., 10–13. viii. 1996, T. YASUNAGA (HUES); 2♀, Asari Pass, Otaru C., Ishikari, on *Salix* sp., 23. vii. 1995, Y. TODO (HUES); 2♀, Mt. Taiheizan, Kaminokuni T., Hiyama, 18. viii. 1994, T. YASUNAGA (HUES); 1♂1♀, same data (NHML); 2♀, same locality and date, R. MATSUMOTO (HUES); 1♂, Yunotai, Hiyama, 19. viii. 1994, T. YASUNAGA (HUES). Honshu: 5♂1♀, Mt. Daibosatsu, Yamanashi Pref., 29. vii. 1991, D. NAKAMURA (HUES); 1♂1♀, Daimonzawa, Mts. Akadake, 2,000–2,500 m alt., Mts. Yatsugatake, Yamanashi Pref., 30. vii. 1987, T. YASUNAGA (HUES); 1♀, Mizukami Vl., Yamanashi Pref., on *Quercus mongolica*, 28. vii. 1987, T. YASUNAGA (HUES); 2♂3♀, Mt. Hakusan, Ishikawa Pref., 31. vii. 1994, I. TOGASHI (HUES); 2♂, Mt. Komyosan, Shizuoka Pref., vii. 1934, K. WATANABE (ELKU); 1♂1♀, Tamakiguchi, Doro Valley, Wakayama Pref., 15. vi. 1993, S. GOTOH (HUES); 1♀, Nichinan T., Hino-gun, Tottori Pref., 12. vii. 1994 (HUES); 2♂2♀, Mt. Kakezu, Geihoku T., Hiroshima Pref., on *Quercus mongolica*, 27. vi. 1987, T. YASUNAGA (HUES); 1♂1♀, same locality, 7. vii. 1990, T. YASUNAGA (HUES); 6♂2♀, Chojabaru, Geihoku T., Hiroshima Pref., 10–11. vii. 1994, light trap, K. YOSHIZAWA (HUES); 1♀, Mt. Dogo, Hiba-gun, Hiroshima Pref., 19. ix. 1992, T. YAMAUCHI (HUES). Shikoku: 2♂, Minaminoma, Tokushima Pref., 20. vii. 1952, S. MIYAMOTO (ELKU); 1♂, Tomioka, Kochi Pref., 1. viii. 1933, I. OKUBO (ELKU); 2♀, Nishikuma, Monobe Vl., Kochi Pref., 30. vii. 1994, M. TAKAI (HUES); 1♂1♀, Kurotaki, Nankoku C., Kochi Pref., 5. viii. 1994, M. TAKAI (HUES). Kyushu: 1♂, Okinoshima Is., Fukuoka Pref., 12. vi. 1965, Y. HIRASHIMA & T. HIDAKA (ELKU); 1♂, Mt. Hikosan, Fukuoka Pref., 16. vii. 1939, M. FUJINO (ELKU); 1♂, same locality, 7. ix. 1970, light trap, K. TAKENO (HBLK); 1♂, same locality, 13. vi. 1974, light trap, K. TAKENO (HBLK); 1♀, same locality, 22. vi. 1974, light trap, K. OHARA (HBLK); 1♀, same locality, 4. vii. 1975, light trap, K. TAKENO (HBLK); 2♂, same locality, 11–14. ix. 1975, light trap, K. TAKENO (HBLK); 1♂, same locality, 3–4. viii. 1988, light trap, T. YASUNAGA

(HUES); 1♂1♀, Yamada Park, Kitakyushu C., Fukuoka Pref., 17. vi. 1990, T. YASUNAGA (HUES); 1♀, same locality and date, Y. SAWADA (HUES); 1♀, Minamihata-dam, Fukuoka C., Fukuoka Pref., on flowers of *Mallotus japonicus*, last-instar nymph when collected on 22. vi. 1993 and emerged on 23. vi., K. YAMAMOTO (HUES); 1♂, Mt. Sobosan, Oita Pref., 5. vii. 1932, M. FUJINO (ELKU); 2♂2♀, Mt. Shiratori, Izumi Vl., Kumamoto Pref., 6. vii. 1991, T. YASUNAGA (HUES); 1♂, Momiki, Izumi Vl., 5. vii. 1991, at light, T. YASUNAGA (HUES); 2♀, same locality, 19. vii. 1992, T. YASUNAGA (HUES); 1♀, Mt. Yamaingiri, Izumi Vl., 16. vii. 1994, light trap, R. MATSUMOTO (HUES); 1♂, Mt. Gokahara, Mts. Tara, Nagasaki Pref., 21. vi. 1986, light trap, M. EJIMA; 1♀, same locality, 1,050 m alt., 15. viii. 1990, light trap, T. YASUNAGA (HUES); 3♂, Azuma T., Minamitakaki-gun, Nagasaki Pref., 29. viii. 1992, light trap, T. YASUNAGA (HUES).

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Rishiri Is., Rebun Is., Tsushima Is., Okinoshima Is.), Kunashiri Is.

Remarks. This species is easily recognized by the characters mentioned in diagnosis. Somewhat resembling certain species of *Adelphocoris* (e.g., *A. tenebrosus*), *O. tricolor* is readily distinguished by the more elongate body, mesal sulcus on vertex and bicolorous antennal segments III and IV.

Orientomiris tricolor is associated with many kinds of broadleaf host plants, such as *Quercus mongolica* var. *grosserrata* (Fagaceae), *Kalopanax pictus* (Araliaceae), *Salix* spp. (Salicaceae) (TODO & YASUNAGA, 1996), *Hydrangea paniculata* (Saxifragaceae) and *Mallotus japonicus* (Euphorbiaceae). Predation on an aphrophorid leafhopper, *Aphrophora costalis*, by a last-instar nymph was observed in the laboratory (Fig. 1, A). This species seems to hibernate as egg and have one generation per year. The last-instar nymphs are found from late May to early August, and new imagines appear from early June. The adults are occasionally attracted to light.

Orientomiris eurytus (YASUNAGA), n. comb.

(Figs. 1, B; 3)

Creontiades eurytus YASUNAGA, 1988, Kontyû Tokyo, **56**: 475; MIYAMOTO & YASUNAGA, 1989, *in* Check List Japan. Ins., **1**: 159; ICHITA, 1989, Celastrina, (22): 34; YASUNAGA, 1991, Jpn. J. Ent., **59**: 504; SCHUH, 1995, Plant Bugs of the World, p. 744.

Diagnosis. Recognized by the conspicuously elongate and blackish body, yellowish white bases of the antennal segments III and IV, long rostrum exceeding the hind coxa and reaching the abdominal sternum V or VI, and yellow or reddish brown anterior half of the pronotum. Descriptions of male and female adults were provided by YASUNAGA (1988 & 1991, respectively).

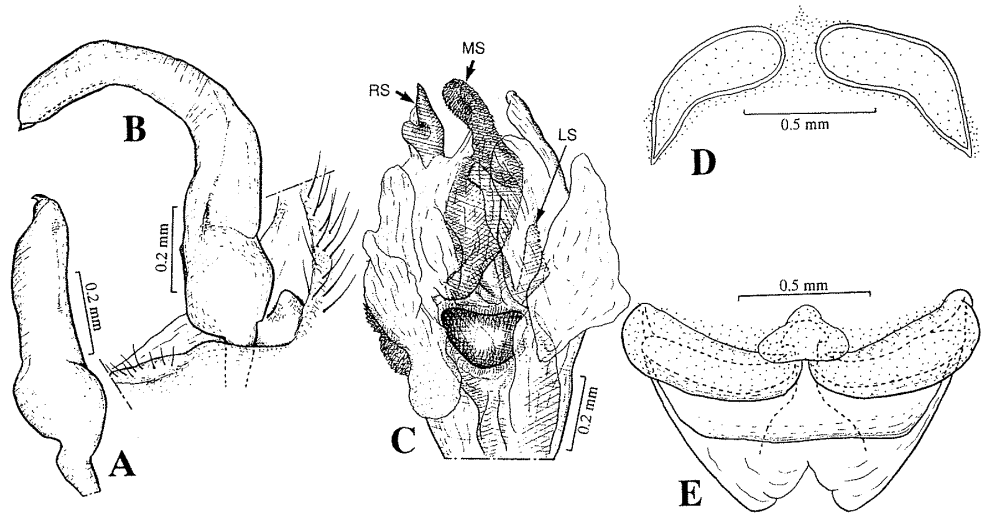

Fig. 3. Male (A–C) and female (D–E) genitalia of *Orientomiris eurytus*. A, Right paramere, B, left paramere; C, vesica; D, sclerotized ring; E, posterior wall of bursa copulatrix.

Male genitalia (Fig. 3, A–C): Parameres glabrous; right paramere not strongly narrowed distally (Fig. 3, A). Vesica with small, rounded, subapically constricted MS; LS shortened; RS broad (C).

Female genitalia (D–E): Similar to those of *O. tricolor*. Posterior wall of bursa copulatrix with rather wide interramal lobes and narrow dorsal structure (E).

Dimensions. ♂/♀: Body length 9.60–9.90/10.00–10.50; head width including eyes 1.48–1.50/1.50–1.52; vertex width 0.50/0.55–0.58; length of antennal segment I 1.50–1.53/1.72–1.73, II 4.17–4.28/4.55, III 2.96–3.08/3.12–3.13, IV 1.50–1.52/1.50; rostral length 4.92–5.00/5.50–5.53; length of rostral segment I 1.27–1.28/1.47–1.48, II 1.25/1.50, III 0.97–0.98/1.00, IV 1.55/1.73–1.74; mesal pronotal length including collar 1.75–1.80/1.87–1.99; basal pronotal width 2.62–2.68/2.82–2.99; maximum width across hemelytra 2.85–3.02/3.20–3.30; length of hind femur 4.65–4.85/5.35, tibia 7.25–7.45/8.25, tarsus 1.10–1.15/1.15; length of hind tarsomere I 0.27–0.28/0.32–0.33, II 0.50/0.50, III 0.52–0.53/0.56–0.57.

Specimens examined. Honshu: 1♀, Kansuizawa, Aomori C., Aomori Pref., 30. viii. 1990, T. ICHITA (IC); 1♀, Mt. Mitake, Ome, Tokyo, 13. viii. 1960, T. MAENAMI (NIAES); Mt. Daibosatsu, Yamanashi Pref., 29. vii. 1991, T. NAKAMURA (HUES); 1♂1♀, Mt. Daisen, Tottori Pref., 12. vii. 1994, light trap, K. YOSHIZAWA (HUES). Shikoku: 1♀, Nishikuma, Monobe Vl., Kochi Pref., 30. vii. 1994, light trap, M. TAKAI (HUES); 1♂, Ohnogahara, Ehime Pref., on *Pinus densiflora*, 5. viii. 1993, T. YASUNAGA (HUES). Kyushu: 1♂, Mt. Hikosan, Fukuoka Pref., 2. viii. 1977, light trap, K. TAKENO (holotype,

ELKU); 1♂, same locality, 3. viii. 1975, light trap, K. TAKENO (paratype, HBLK); 1♂, same locality, 3. viii. 1986, light trap, T. YASUNAGA (paratype, HUES); 1♂, 3–4 viii. 1988, light trap, T. YASUNAGA (HUES).

Distribution. Japan (Honshu, Shikoku*, Kyushu).

Remarks. This species is closely allied to *O. tricolor* (SCOTT), from which it can be distinguished by the yellowish white bases of antennal segments III and IV and yellow or pale red anterior part of the pronotum, in addition to being significantly larger and more blackish. These two are endemic to Japan, and considered to be sister species.

Because most specimens of *eurytus* were collected by light traps, its host plants remain unclear. I once collected a male from the conifer *Pinus densiflora* (Pinaceae)–possibly an occasional landing.

Orientomiris flavicollaris YASUNAGA, n. sp.

(Figs. 1, C; 4; 6, A–B)

Diagnosis. Recognized by the rather long dorsal vestiture, shiny blackish brown pronotum with a yellow collar and posterior margin, red tinged cuneus, and widely pale leg.

Description. Body oblong-oval, subparallel-sided; dorsal surface generally dark brown, partly tinged with red. Head chestnut brown, weakly granulated, subvertical, with silky, suberect pubescence; frons, tylus and jugum somewhat pale. Antenna dark brown; basal parts of segment I pale brown dorsally; basal

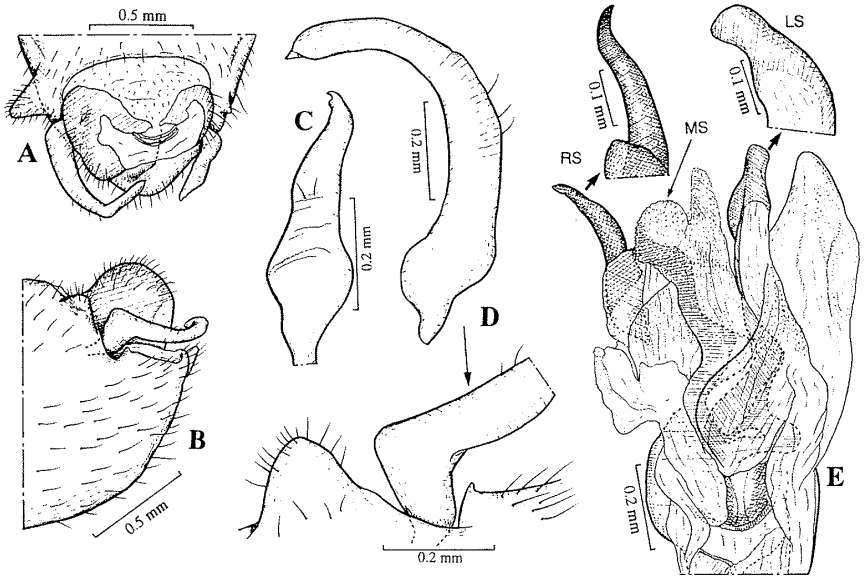

Fig. 4. Male genitalia of *Orientomiris flavicollaris*. A, Genital segment in dorsal view; B, ditto in left lateral view; C, right paramere, D, left paramere; E, vesica

half of segment II brown; basal 1/4 of segment III and base and extreme apex of IV yellowish; length of segments (♂/♀): 1.47–1.48/1.52–1.53, 3.30–3.33/3.25–3.50, 2.52–2.75/2.72–2.75, 1.35–1.38. Rostrum shiny chestnut brown, reaching or slightly exceeding hind coxa; segment III and basal part of IV paler; length of segments I–IV (♂/♀): 0.80–0.92/0.90–0.98, 0.82–0.90/0.88–0.90, 0.55–0.58/0.60–0.65, 0.92–0.97/0.98–1.00.

Pronotum blackish brown, shining, with yellow basal margin, weakly and shallowly rugose, uniformly clothed with silky, suberect, long pubescence; collar yellowish brown; mesoscutum somber yellowish brown, shagreened; scutellum dark chestnut brown, rather shining, with slightly pale apex, somewhat arched, weakly rugose, bearing silky, suberect, long pubescence; thoracic sides partly yellow or red tinged; ostiolar peritreme yellow. Hemelytra dark chestnut brown, shagreened, uniformly clothed with silky, recumbent pubescence; apical parts of embolium and cuneus tinged with red; lateral margin of cuneus yellow; membrane grayish brown. Coxa and leg yellowish brown; femora bearing several rows of silky, erect setae; apical part of hind femur sometimes infuscate or reddish brown; hind tibia reddish brown; tibial spines brown, somewhat reddish; apical half of tarsomere III darkened; length of hind femur, tibia and tarsus (♂/♀): 3.65–3.70/3.95–4.00, 5.45–5.75/5.95, 0.70–0.78/0.75. Abdomen dark or reddish chestnut brown; ventromedian part of male genital segment yellowish brown or pale reddish brown.

Male genitalia (Fig. 4): Genital segment with a pair of distinct cone-shaped process near base of each paramere (A–B); parameres with a few sensory setae (C–D). Vesica (E) with weak MS; LS flattened, blunt-tipped; RS horn-like.

Female genitalia (Fig. 6, A–B): Sclerotized rings apparently slender (A). Interramal lobes of posterior wall wide, each lobe contiguous mesally (B).

Dimensions. ♂/♀: Body length 7.10–7.50/7.90–8.40; head width including eyes 1.28–1.35/1.31–1.38; vertex width 0.40–0.42/0.42–0.45; rostral length 3.05–3.18/3.35–3.48; mesal pronotal length including collar 1.25–1.28/1.25–1.45; basal pronotal width 2.12–2.14/2.20–2.38; maximum width across hemelytra 2.50–2.57/2.90–3.00.

Holotype: ♂, Yona, Kunigami Is., Okinawa Is., the Ryukyus, 20–24. v. 1993, T. YASUNAGA (HUES). Paratypes: Okinawa Is.: 2♂, same locality as for holotype, 14. iv. 1991, T. NAKAMURA (HUES); 2♂6♀, same data as for holotype (HUES); 1♂1♀, same locality, on *Schima wallichii*, last-instar nymphs when collected on 12. iv. 1993 and emerged on 23–29. iv., Y. NAKATANI (UOP); 1♂1♀, same locality, on flowers of *S. wallichii*, 21. v. 1993, T. YASUNAGA (HUES); 3♀, same locality, 21. v. 1993, Y. NAKATANI (HUES); 1♂, same locality and collector, 23. v. 1993, light trap (HUES); 1♂3♀, same locality and collector, 25. v. 1993 (HUES); 2♀, Sate, 24. v. 1993, T. YASUNAGA (HUES); 1♀, Oura, 4. vi. 1990, M. HAYASHI *et al.* (HUES); 1♀, Ura,

Kunigami Vl., 27. vi. 1992, light trap, M. HAYASHI (HUES); 2♂, Oku, 16–17. v. 1978, H. MAKIHARA (MNHA).

Distribution. Japan (the Ryukyus: Okinawa Is.).

Remarks. The new species resembles *O. tricolor*, from which it is easily distinguished by the longer and denser dorsal vestiture, shiny and less rugose pronotum with a yellow collar and basal margin, and almost entirely pale leg.

Schima wallichii (Theaceae) is the only confirmed host plant, on which two last-instar nymphs were collected as mentioned above. This mirid is occasionally attracted to light.

Orientomiris yaeyamanus YASUNAGA, n. sp.

(Figs. 5; 6, C–F)

Diagnosis. Recognized by the rather dense dorsal vestiture, short rostrum not exceeding the hind coxa, uniformly darkened pronotum, scutellum and hemelytra, and yellow femora.

Description. Body rather elongate, subparallel-sided; dorsal surface generally dark brown, with uniformly and rather densely distributed, silky, suberect, long pubescence. Head somber brown, somewhat shagreened, rather oblique, with sparse, silky, suberect pubescence; frons tinged with yellow, almost smooth; lorum and tylus slightly yellow. Antennal segment I dark chestnut brown; segment II brown; segments III and IV yellowish brown, with paler bases; length of segments I–IV (♂/♀): 1.37–1.50/1.47–1.48, 3.30–3.53/3.52–

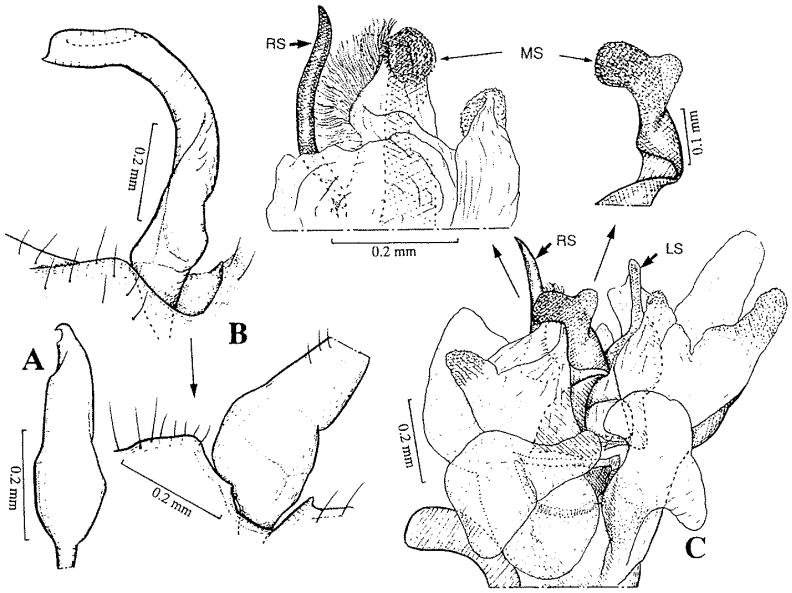

Fig. 5. Male genitalia of *Orientomiris yaeyamanus*. A, Right paramere, B, left paramere; C, vesica.

3.53, 2.65–2.75/2.77–2.78, 1.27–1.33/?. Rostrum brown, shining, reaching but not exceeding hind coxa; apical part of segment IV darkened; length of segments I–IV (♂/♀): 0.85–0.88/0.92–0.93, 0.85–0.88/0.82–0.83, 0.61–0.65/0.65, 1.00/1.02–1.03.

Pronotum entirely blackish brown, subshining, shallowly rugose, with uniform, silky, suberect pubescence; collar sometimes yellowish, pruinose or shagreened; scutellum dark brown, rather flat, transversely wrinkled, with sparse, silky, suberect pubescence; ostiolar peritreme yellowish brown. Hemelytra entirely dark chestnut brown, shagreened, with uniform, silky, suberect pubescence; membrane dark grayish brown. Coxae and legs yellow; femora with several rows of pale, erect setae; apical 1/4–1/3 of hind femur usually darkened; tibiae with pale, suberect setae; hind tibia reddish brown; tibial spines blackish brown, prominent; apical halves of tarsomeres III infuscate; lengths of hind femur, tibia, tarsus (♂/♀): 3.50–3.65/3.75, 5.45–5.50/5.75, 0.75–0.78/0.72–0.73; that of hind tarsomeres I–III (♂/♀): 0.21–0.25/0.25, 0.30–0.32/032–0.33, 0.33–0.38/0.33–0.34. Abdomen dark brown; lateral sides widely reddish.

Male genitalia (Fig. 5): Left paramere weakly curved, with several, short sensory setae, apical part not widened (B). Vesical MS hammerhead-shaped, provided with mane-like membranous processes ventrally; LS and RS elongate (C).

Female genitalia (Fig. 6): Sclerotized rings subrectangular, comparatively thick-rimmed (C); posterior wall of bursa copulatrix with a mushroom-shaped dorsal structure; each interramal lobe somewhat separated mesally (D).

Dimensions. ♂/♀: Body length 7.50–7.60/8.00; head width including eyes 1.27–1.30/1.30; vertex width 0.40–0.43/0.42–0.43; rostral length 3.07–3.15/3.07–3.08; mesal pronotal length including collar 1.25–1.38/1.35; basal pronotal width 2.12–2.20/2.28–2.29; maximum width across hemelytra 2.45–2.50/2.75.

Holotype: ♂, Funaura, Iriomote Is., the Ryukyus, Japan, 28. v. 1990, light trap, M. HAYASHI *et al.* (HUES).

Paratypes: Iriomote Is.: 1♂, Fukari, 12. v. 1993, M. HAYASHI (HUES); 1♀, Komi, same date, M. HAYASHI (HUES); 1♂, Mombanare, nr. Otomi, same date, M. HAYASHI (HUES).

Distribution. Japan (the Ryukyus: Iriomote Is.).

Remarks. This new species is similar in general appearance to *O. flavicollaris*, from which it is easily distinguished by the uniformly brown antennal segment II, unicolorously dark pronotum without the yellow basal margin, dark cuneus not tinged with red, longer femoral setae, and blackish tibial spines. No information is available on its ecology.

Orientomiris yaeyamanus nigripes YASUNAGA, n. ssp.

(Fig. 6, E–F)

Diagnosis. Similar to nominotypical subspecies in general appearance, but differing in the more oval body, and darker antenna and femora.

Description. Body elongate oval, comparatively wide; general coloration generally darker; dorsal surface with silky, suberect pubescence. Head almost unicolorous, brown or dark brown. Antenna brown; basal 2/3 of segment II, basal 1/3 of III and base of IV pale brown; length of segment I–IV (♂/♀): 1.52–1.53/1.47–1.55, 3.67–3.68/3.50–3.53, 2.92–2.93/2.82–2.85, ?/?. Rostrum dark chestnut brown, shining, reaching or slightly exceeding hind coxa; segment III sometimes pale; length of segments I–IV (♂/♀): 0.82–0.83/0.90, 0.87–0.88/0.87–0.88, 0.55/0.62–0.63, 1.00/1.01–1.02.

Pronotum, scutellum and hemelytra unicolorously dark chestnut brown, shagreened or rugose, uniformly clothed with silky, suberect pubescence; ostiolar peritreme usually dark. Coxae and femora generally dark; pro- and midfemora sometimes pale brown; hind femur widely dark chestnut brown, with slightly paler basal 1/3; tibiae pale brown, with blackish spines; hind tibia reddish brown; tarsi pale brown; apical half of tarsomeres III infuscate; length of hind femur, tibia and tarsus (♂/♀): 3.85/3.75–3.85, 5.95/5.90, 0.80/0.80;

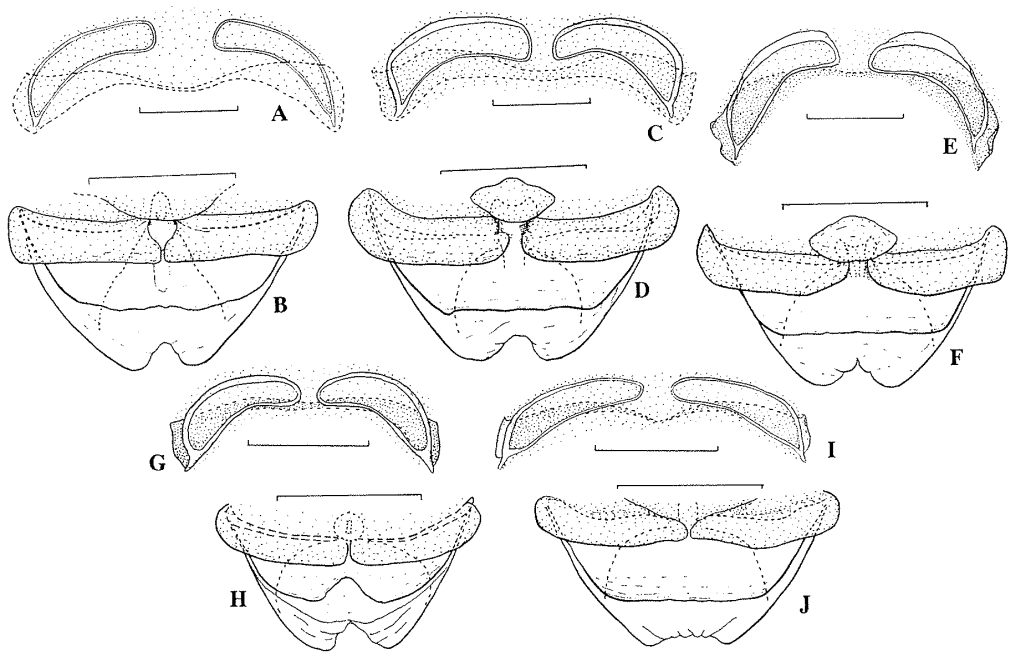

Fig. 6. Female genitalia of *Orientomiris flavicollaris* (A–B), *O. yaeyamanus yaeyamanus* (C–D), *O. y. nigripes* (E–F), *O. nigripennis* (G–H) & *O. erythromelas* (I–J). A, C, E, G & I, Sclerotized rings; B, D, F, H & J, posterior wall of bursa copulatrix. Scales: 0.5 mm.

that of hind tarsomeres I–III (♂/♀): 0.25/0.25, 0.35/0.30–0.33, 0.35/0.35–0.38. Abdomen dark chestnut brown.

Male genitalia: Not significantly differing from those of the nominotypical subspecies. Female genitalia (Fig. 6, E–F): As in the nominotypical subspecies, but sclerotized rings thicker and somewhat bent (E).

Dimensions. ♂/♀: Body length 7.40/7.80; head width including eyes 1.25–1.30/1.32–1.33; vertex width 0.45/0.42–0.45; rostral length 3.17–3.40/3.45; mesal pronotal length including collar 1.37–1.43/1.45; basal pronotal width 2.20–2.33/2.37–2.38; maximum width across hemelytra 2.80–2.90/2.87–2.88.

Holotype: ♂, Sonai, Yonakuni Is., the Ryukyus, Japan, 11. iv. 1979, H. MAKIHARA (MNHA). Paratypes: Yonakuni Is.: 1♀, Mt. Urabedake, 6. iv. 1991, T. NAKAMURA (HUES); 1♂, same locality, 31. vii. 1994, T. YAMAUCHI (HUES); 1♀, Hihigawa, 8. iv. 1991, T. NAKAMURA (HUES).

Distribution. Japan (the Ryukyus: Yonakuni Is.).

Remarks. This new subspecies differs from the nominotypical subspecies in the thick-rimmed female sclerotized rings in addition to external characters as mentioned in the diagnosis. No significant differences have been found in the male genitalia between them. These forms may, therefore, belong to the same species, inhabiting the different islands.

Orientomiris nigripennis YASUNAGA, n. sp.

(Figs. 6, G–H; 7, A, C–D & G)

Diagnosis. Recognized by the uniformly blackish dorsal surface with rather short vestiture, yellow and mesally red neck of the fuscous head, uniformly blackish antennal segments I and II, and yellow basal 1/2 of the blackish hind femur.

Description. Body rather elongate, nearly parallel-sided; dorsal surface blackish brown, with uniformly distributed, silky pubescence. Head dark chestnut brown, with yellow and mesally reddish neck, somewhat shagreened, bearing sparse, short, erect pubescence. Antenna blackish brown; basal 1/3 of segment III and basal 1/4 and extreme apex of IV yellowish brown; length of segments I–IV (♂/♀): 1.27–1.28/1.45, 3.27–3.28/3.35, 2.52–2.53/2.55, 1.25/?. Rostrum shiny, dark chestnut brown, reaching but not exceeding hind coxa; segment III and basal part of IV somewhat paler; length of segments I–IV (♂/♀): 0.77–0.78/0.77–0.78, 0.80/0.77–0.78, 0.55/0.60, ?/0.87–0.88.

Pronotum blackish brown, rather shiny, weakly rugose, with sparse, silky pubescence; collar dark brown, shagreened; scutellum blackish brown, rather shiny, somewhat roundly arched, weakly rugose, bearing sparse, silky pubes-

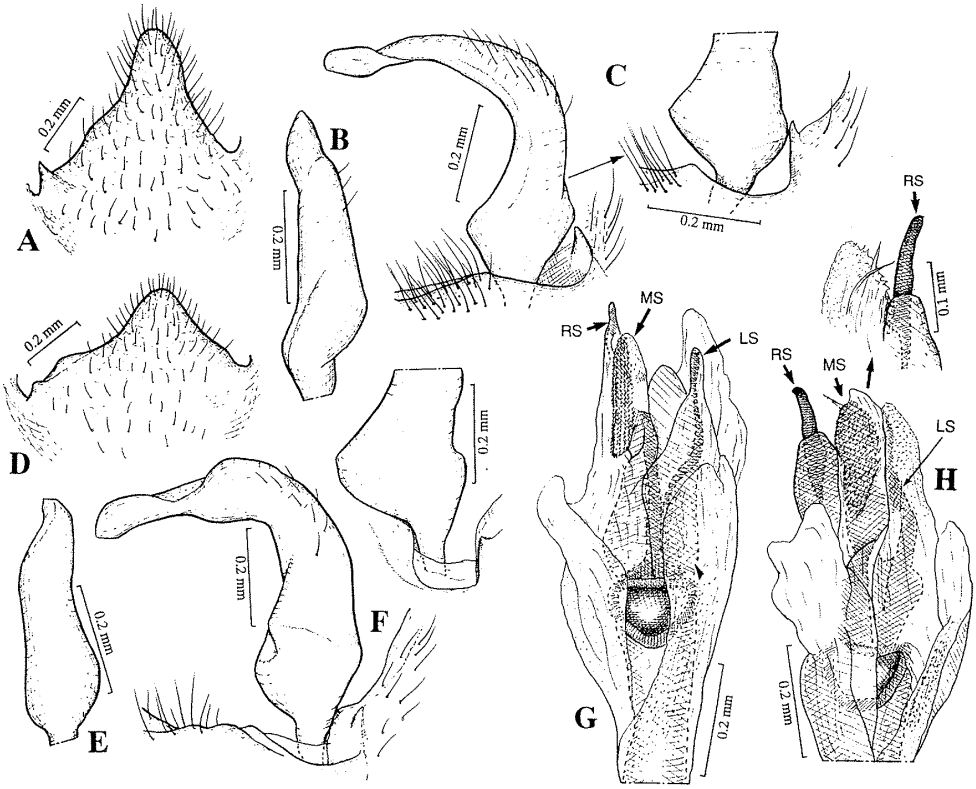

Fig. 7. Male genitalia of *Orientomiris nigripennis* (A, C, D & G) & *O. erythromelas* (B, E, F & H). A & B, Apex of genital segment in posterior view; C & E, right paramere; D & F, left paramere; G & H, vesica.

cence; thoracic sides widely fuscous, with yellow ostiolar peritreme. Hemelytra blackish brown, subshining and shagreened, with uniformly distributed, silky, recumbent, short pubescence; membrane dark grayish brown, with fuscous veins. Coxa and femur blackish brown; trochanter yellow; basal half of hind femur yellow; pro- and midtibiae brown; hind tibia blackish brown; tibial spines dark brown; tarsi pale brown; apical halves of tarsomeres III infuscate; length of hind femur, tibia and tarsus (♂/♀): 3.50/3.60, 5.35/5.10, 0.75/0.70; that of hind tarsomeres I–III (♂/♀): 0.23–0.24/0.25, 0.27–0.28/0.28–0.29, 0.37–0.38/0.36–0.37. Abdomen blackish chestnut brown, subshining; ventral mesal part of ♂genital segment narrowly pale; ventromedian part of ♀ abdomen widely pale.

Male genitalia (Fig. 7, A–C & G): Posterior apex of genital segment strongly projected (A). Parameres with distinct sensory hairs; left paramere twisted and flattened apically (C); right paramere with broad apex (B). Vesica (G) slender in general shape, with a small, triangular spine at right of gonopore; MS long, brush-shaped; LS and RS not developed. Female genitalia (Fig. 6, G–H): Sclerotized rings rather small (G). Interramal sclerite of posterior wall narrowed mesally (H).

Dimensions. ♂/♀: Body length 7.25/7.80; head width including eyes 1.27–1.28/1.25; vertex width 0.37–0.38/0.42–0.43; rostral length ?/3.02–3.03; mesal pronotal length including collar 1.30/1.32–1.33; basal pronotal width 2.17–2.18/2.20; maximum width across hemelytra 2.37–2.38/2.52–2.53.

Holotype: ♂, Fukumoto, Amami-Oshima, the Ryukyus, Japan, 1. vii. 1992, R. NODA (HUES). Paratype: 1♀, Kamiya, Amami-Oshima, 2. vii. 1992, R. NODA (HUES).

Distribution. Japan (the Ryukyus: Amami-Oshima).

Remarks. This new species is similar to *O. flavicollaris*, from which it is easily distinguished by the uniformly fuscous dorsal surface and antennal segments I and II, recumbent short pubescence uniformly covering the hemelytra, and blackish hind femur with the yellow basal half.

Orientomiris erythromelas YASUNAGA, n. sp.

(Figs. 6, I–J; 7, B, E–F & H)

Diagnosis. Easily recognized by the almost entirely pale red femora.

Description. Body rather elongate and parallel-sided; dorsal surface concolorously dark brown, with uniformly distributed, silky pubescence. Head dark chestnut brown, weakly granulated, with reddish neck, bearing silky, suberect, short pubescence. Antenna dark reddish brown; basal 1/3 of segment III yellowish brown; extreme base and apex of segment IV yellowish brown, somewhat tinged with red; length of segments I–IV (♂/♀): 1.45/1.51–1.55, 3.57–3.58/3.80–3.93, 2.72–2.73/3.02–3.03, 1.32–1.33/1.37–1.38. Rostrum shiny dark reddish brown, reaching but not exceeding hind coxa; segment III and basal part of IV somewhat paler; length of segments I–IV (♂/♀): 0.87–0.88/0.97–1.00, 0.80/0.95–1.00, 0.67–0.68/0.60–0.70, 1.00/1.05–1.10.

Pronotum blackish brown, rather shiny, transversely rugose, uniformly with silky, suberect pubescence; collar dark grayish brown, pruinose; scutellum blackish brown, less arched, transversely rugose, with sparse, silky pubescence; thoracic sides widely chestnut brown, with yellow ostiolar peritreme. Hemelytra concolorously dark brown, shagreened and finely rugose, uniformly clothed with silky, rather recumbent pubescence; membrane dark grayish brown. Femora almost entirely pale red; hind femur somewhat infuscate apically; tibiae and tarsi pale brown, except for darker hind tibia; tibial spines reddish brown; apices of tarsomeres III darkened; length of hind femur, tibia and tarsus (♂/♀): 3.50/4.00–4.10, 5.60/6.05, 0.75/0.80; that of hind tarsomeres I–III (♂/♀): 0.25/0.25, 0.26–0.27/0.31–0.32, 0.37–0.38/0.37–0.38. Abdomen dark reddish brown; ventral mesal part paler.

Male genitalia (Fig. 7, D–F & H): Genital segment not strongly projected

at posterior end (B). Left paramere broad, blunt-tipped, constricted subapically (F); right paramere truncate at apex (E). Vesical MS with several thin, slender processes ventrally; LS narrow, not projected at apex; RS distinct (H).

Female genitalia (Fig. 6, I–J): Sclerotized ring slender, thin-rimmed (I). Posterior wall of bursa copulatrix with rather wide interramal sclerite (J).

Dimensions. ♂/♀: Body length 7.20/8.20–8.50; head width including eyes 1.27–1.28/1.32–1.38; vertex width 0.45/0.47–0.49; rostral length 3.32–3.33/3.55–3.58; mesal pronotal length including collar 1.30/1.43–1.45; basal pronotal width 2.15/2.35; maximum width across hemelytra 2.30/2.57–2.73.

Holotype: ♂, Nishinakama, Sumiyo Vl., Amami-Oshima, the Ryukyus, Japan, 29. v. 1993, T. YASUNAGA (HUES). Paratypes: Amami-Oshima: 1♀, Hatsuno, 6. vi. 1978, Y. SYONO (MNHA); 1♀, same locality as for holotype, 7. vi. 1978, Y. SYONO (MNHA).

Distribution. Japan (the Ryukyus: Amami-Oshima Is.).

Remarks. This new species is similar in general appearance to *Megacoelum rubripedum* LI & ZHENG, a continental Chinese species, from which it is easily distinguished by the darker antennal segments I and II, darker hind tibia with the paler tibial spines, and different male genital structure.

Orientomiris erythromelas and *O. nigripennis* are sympatric on Amami-Oshima, where adults of the former seem to emerge earlier than those of the latter.

Zoogeography and Phylogeny of Japanese Species of *Orientomiris*

Aut- and synapomorphies shown in Fig. 8 are as follows: 1, vesica with a single horn-like spiculum (possibly homologous with RS of *Orientomiris*); 2, vesica with three sclerites (RS+MS+LS); 3, sclerotized rings thin-rimmed and enlarged; 4, body conspicuously elongate; 5, MS completely and roundly sclerotized; 6, MS and LS continuously sclerotized ventrally, fused with each other basally; 7, RS thickened; 8, posterior apex of male genital segment projected; 9, left paramere twisted subapically; 10, vesica with a small, triangular spine; 11, RS noticeably elongate; 12, left paramere broad, depressed subapically; 13, LS well developed; 14, MS with dense, mane-like processes ventrally.

As mentioned in the generic discussion, the presence of three sclerites on the vesica (RS+MS+LS) is considered to be a synapomorphy for the *Orientomiris* species (2). All the species of the genus exhibit great similarity in external appearance, and seem to be associated with broadleaf host plants. This genus, together with the apparently closely related *Megacoelum*, may have originated in the eastern continental Eurasia so far as based on the distributions of the

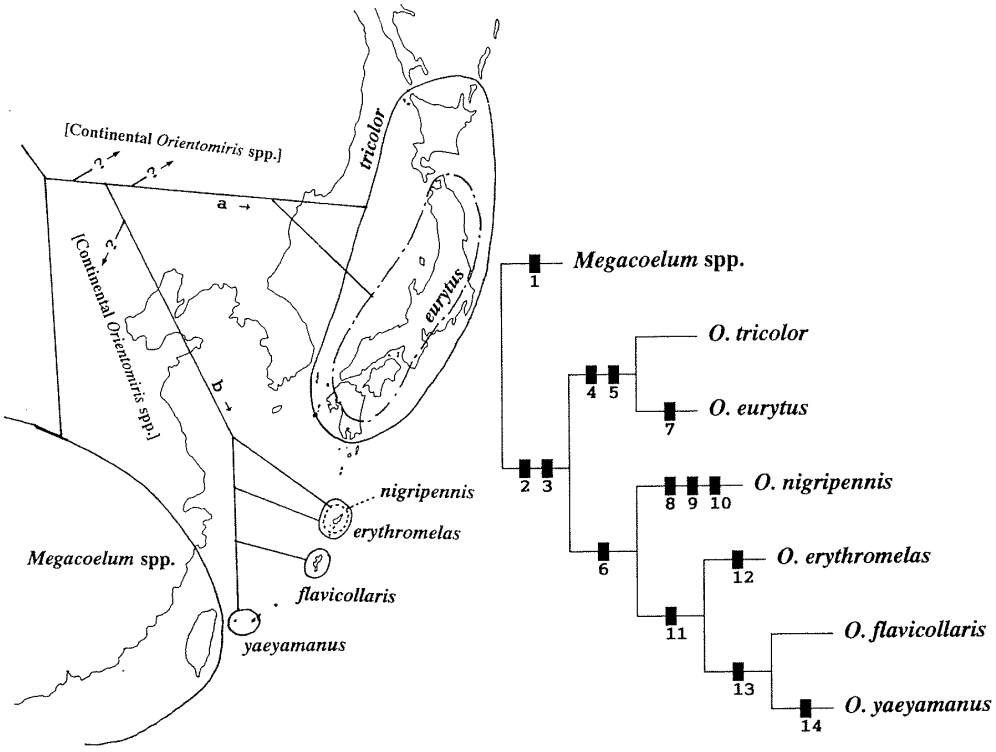

Fig. 8. Distribution map and inferred phylogenetic relationships of *Orientomiris* spp.

known species.

The Japanese species of *Orientomiris* represent two monophyletic groups. One of them, containing *tricolor* and *eurytus*, may have invaded to Japan through a landbridge that connected Kyushu with the Korean Peninsula in the Quaternary Ice Age (a); species of the other group spread over the Ryukyus via Taiwan 120–15 thousand years ago (b). The extant Japanese species may have appeared after the Würm Glaciation, when the islands of Japan proper and the Ryukyus became isolated by the straits.

There are many other species of *Orientomiris* in Asia. Seven Chinese species described in *Megacoelum* by LI and ZHENG (1991) should be transferred to *Orientomiris*. Further, I have more than ten undetermined *Orientomiris* species from eastern Asia and Southeast Asia. Three species-groups or monophyletic groups are recognizable in these continental species (their branching order is suggested by ?'s in the figure). Needless to say, more detailed analyses on characters of all the species occurring in Asia are necessary for establishment of an accurate pattern of their phylogenetic relationships.

(to be continued)

(Received February 7, 1997; Accepted June 20, 1997)