

Revision of the Reinstated Genus *Pachyosa* Fairmaire, 1897 (Coleoptera: Cerambycidae: Lamiinae: Mesosini)

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Junsuke Yamasako and Nobuo Ohbayashi (2012) Revision of the reinstated genus *Pachyosa* Fairmaire, 1897 (Coleoptera: Cerambycidae: Lamiinae: Mesosini). *Zoological Studies* 51(6): 819-831. The genus *Pachyosa* Fairmaire, 1897, which had been treated as a synonym of *Mesosa* (*Saimia*), is reinstated. Five species and 1 subspecies distributed in southwestern Japan and Taiwan are included in the genus as follows: *P. cervinopicta* Fairmaire, 1897, comb. rev.; *P. hirtiventris* (Gressitt, 1937), comb. nov.; *P. kojimai* (Hayashi, 1974), comb. nov.; *P. atronotata atronotata* (Kusama and Irie, 1976), comb. nov.; *P. atronotata yamawakii* (Hayashi, 1976), comb. nov.; and *P. itoi* (N. Ohbayashi, 1985), comb. nov. <http://zoolstud.sinica.edu.tw/Journals/51.6/819.pdf>

Key words: *Mesosa* (*Saimia*), Endophallus, Taxonomy, Japan, Taiwan.

The monotypic genus *Pachyosa* was erected by Fairmaire (1897) for *P. cervinopicta* Fairmaire, 1897. Later, Breuning (1938-1940) synonymized *Pachyosa* with the subgenus *Saimia* Pascoe, 1866 of the genus *Mesosa* Latreille, 1829.

Saimia Pascoe, 1866 was a substitute name for the genus *Samia* Pascoe, 1865 (nec Hübner, 1819), of which the type species is *Samia albidorsalis* Pascoe, 1865. Later, Breuning (1938-1940) downgraded *Saimia* to a subgenus of the genus *Mesosa*. It was simply distinguished from the other subgenera of *Mesosa* by the pronotum with 3 distinct tubercles, elytra without long suberect hairs and high bosses near the bases (Breuning 1938-1940). To the present, over 40 species are known from Southeast Asia.

In the course of our studies on the Asian Mesosini, we concluded that the subgenera of the genus *Mesosa* could be divided into different genealogical species groups by the external and male genital structures. Of those, 5 species of *Mesosa* (*Saimia*) including the type species of

Pachyosa, distributed in southwestern Japan and Taiwan, including *M. (S.) cervinopicta*, are a homogeneous group, and were considered to be an independent genus because of their unique endophallic structures. Therefore, the genus *Pachyosa* should be reinstated for this group of *Mesosa* (*Saimia*). Herein, we would now like to revise the genus *Pachyosa* based mainly on the endophallic features of the male genitalia.

MATERIALS AND METHODS

The depositories of the type specimens examined are abbreviated as follows: Ehime Univ. Museum (EUMJ), Matsuyama, Japan; and California Academy of Sciences (CAS), CA, USA. Structures of the endophallus were observed under a fully inflated condition without eversion. The observational method and terminologies of the endophallus were defined according to Yamasako and Ohbayashi (2011).

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The abbreviations used in the text for the endophallic term are as follows: APH, apical phallomer; AS, sclerite of the apical phallomer; BPH, basal phallomer; CS, crescent-shaped sclerites; CT, central trunk; ED, ejaculatory duct; LSp, large spicules; MPH, median phallomer; MSp, micro spicules; MT, medial tube; PB, pre-apical bulb; SSp, small spicules.

SYSTEMATICS

Genus *Pachyosa* Fairmaire, 1897, stat. rev.

Pachyosa Fairmaire 1897: 71.

Mososa (*Saimia*): Breuning 1939: 412 (partim).

Type species: *Pachyosa cervinopicta* Fairmaire, 1897.

Diagnosis: Body robust, with oblong-boxy shape, medium in size among genera of Mesosini. Eyes subdivided into 2 lobes which are connected by narrow line; lower lobes slightly shorter than wide, well large, almost same length as but sometimes slightly shorter than genae. Antennal tubercles well-elevated. Antennae long; no segment spinose at apical inner side, each fringed beneath with suberect short setae which become sparser toward apical segments; scape thick and short, well-thickened apicad, with a developed cicatrix on apex, shorter than 3rd and 4th segments, respectively; 3rd segment longest. Pronotum wider than long; disk with 3 tubercles which are very distinct but not so strong; each side with small dull projection near apical margin. Prosternal process with extremity barely projecting below, more or less roundly sloped in lateral view. Mesosternal process with a developed tubercle on center near apex, nearly truncated in lateral view. Elytra with pair of indistinct obtuse bosses near bases, without suberect long setae. Mesotibiae with shallow indistinct distal notches at outer margins.

Endophallus (Fig. 1A-C): Endophallus thick and short, nearly or less than twice length of median lobe, indistinctly divided into BPH, MPH, and APH, provided with 3 kinds of spicules: MSp, LSp, and SSp. BPH about 0.3-times as long as TLE, nearly 1/2 length of median lobe, with CS at base. MPH about 0.5-times as long as TLE, almost as long as median lobe, with 3 membrane subdivisions as MT, CT, and PB by constrictions; PB short, almost fused with APH. APH about 0.2-times as long as TLE, quite swollen together with PB, provided with a single ED and AS. CS

indistinct, weakly sclerotized. MSp sparsely distributed on MT. LSp thick, short, obtuse, uni-dentated, densely scattered on CT. MSp area and LSp area almost adjacent. LSp area and SSp area close to each other. ED arisen from near middle of APH on dorsal side. AS consisted of a pair of elongate sclerotized plates.

Remarks: This genus can be distinguished from the other genera of Mesosini by a combination of the following characteristics: eyes subdivided, with well large lower lobes, slightly shorter than to almost same length as genae; antennal scape thick and short, considerably thickened apicad, shorter than 3rd segment; pronotum wider than long, with 3 distinct discal tubercles; mesosternal process with developed tubercle, nearly truncated in lateral view; endophallus thick and short, about twice length of median lobe, with CT densely provided with LSp which are thick, short, obtuse, and uni-dentated.

1. *Pachyosa cervinopicta* Fairmaire, 1897, comb. rev.

(Figs. 1A-C, 2A-B, 5A, 6A-F, 9A, 10A)

Pachyosa cervinopicta Fairmaire 1897: 71. (type locality: I. Ishigaki, Okinawa Pref., Japan).

Mesosa (*Saimia*) *cervinopicta*: Breuning 1939: 415.

Diagnosis: Body black, covered with black pubescence; elytra with some scattered yellowish maculae forming 4 indistinct bands behind humeri, near middle, on apical 1/4, and at extreme apices. Each base of 3rd to last segments of antennae annulated with white pubescence; remainder covered with black pubescence.

Male genitalia ($n = 2$): Tegmen in ventral view oblong-rhombic, gently curved in lateral view; ringed part slightly expanded laterad near middle of tegmen, thence straightly narrowing basad; lateral lobes about 0.2-times as long as total length of tegmen, with inner sides almost straight and outer sides arcuately narrowing in basal 1/2, thence almost straight toward rounded apices, provided with 2 kinds of setae, of which one is long and thick, arising from apical 1/4 on dorsal side and concentrated near apex, and the other short and thin, arising mainly from apical 1/2 of lateroventral sides.

Median lobe gently curved in lateral view; apex roundly acuminate in ventral view; median struts dehiscent from near middle.

Endophallus in lateral view about twice length of median lobe, strongly bent dorsally.

Relative lengths of median lobe and endophallus with membrane areas as follows: ML: TLE: BPH: MPH (MT: CT: PB): APH = 4.9: 10.0: 2.8: 5.6 (1.8: 3.0: 0.7): 1.7. MPH with CT delimited by feeble constriction from MT and by distinct constriction from PB, swollen ventrally in apical 1/2 and bent dorsally at apical 1/3; PB short, strongly inflected dorsally on dorsal side, obliquely extended from dorsal to ventral side. APH indistinctly delimited from PB, very swollen together with PB in elongate-cuboid shape; ED arisen from middle of APH on dorsal side; AS situated on dorsal side of APH, softly sclerosed and slightly colored. MSP sparsely scattered on MT. LSp short, small, unidentate, sparsely distributed on apical 1/2 of CT and densely on basal 1/2. SSp small, short, unidentate, covering almost area of PB and apical area of APH on ventral side. LSp area and MSP area close to each other. SSp area slightly separated from LSp area.

Distribution: I. Ishigaki, I. Iriomote (Okinawa Pref., Japan).

Specimens examined: I. Ishigaki, Okinawa Pref., Japan: 1 ♂, 1 ♀, Arakawa, 16 June 1965, Y. Hori leg.; 1 ♀, Yoshihara, 9 Nov. 1978, K. Kawada leg.; 2 ♂♂, same locality, 1 June 1981, N. Kanie leg.; 1 ♀, From Arakawa to Yoshihara, 1 June

1981, N. Kanie leg.; 3 ♂♂, 1 ♀, Yoshihara, 31 May 1983, Ts. Ito leg.; 1 ♂, 1 ♀, same locality, 4 July 1983 (em.), Ts. Ito leg.; 1 ♂, same locality, 10 June 1986, K. Nagata leg.; Ts.1 ♂, 1 ♀, Yoshihara, 26 June 1991, T. Hanatani leg.; 1 ♀, Takada forest road, 10 June 1993, T. Kishimoto leg. I. Iriomote, Okinawa Pref., Japan: 1 ♂, Koma, 19 July 1978, T. Mizukubo leg.

Remarks: This is the type species of the genus *Pachyosa*.

2. *Pachyosa hirtiventris* (Gressitt, 1937), comb. nov.

(Figs. 2C-D, 5B, 6G-L, 9B, 10B)

Coptops hirtiventris Gressitt 1937: 324, fig. 5. (type locality: I. Hahajima, Ogasawara Is., Tokyo Pref., Japan).

Mesosa (Saimia) hirtiventris: N. Ohbayashi 1992: 8.

Diagnosis: Body covered with light yellowish-ocher pubescence; elytra mingled with white and black longitudinal maculae which alternately form scratchy transverse bands behind humeri and near middle. Each base of 3rd to last segments of antennae annulated with white pubescence; remainder covered with brown or light yellowish-ocher pubescence.

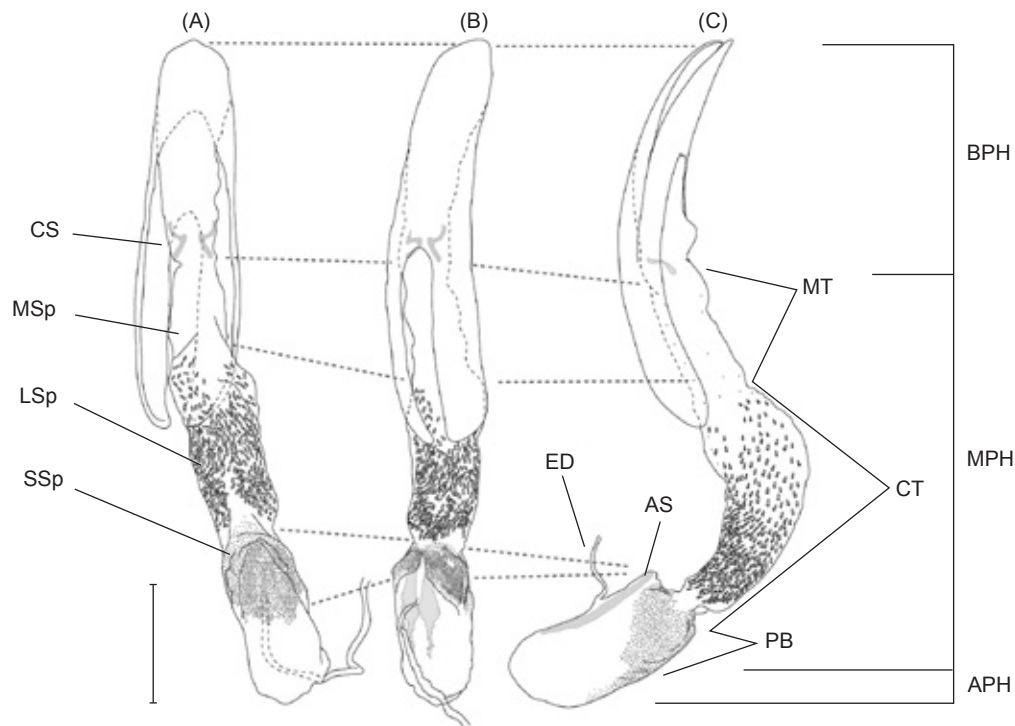


Fig. 1. Median lobe with inflated endophallus of *Pachyosa cervinopicta*. (A) Ventral view; (B) dorsal view; (C) lateral view. Scale bar = 1.0 mm. For abbreviations, see text.

Male genitalia ($n = 1$): Tegmen in ventral view oblong rhombic, widest just before middle, gently curved in lateral view; ringed part slightly expanded laterad near middle of tegmen, thence straightly narrowing basad; lateral lobes about 0.2-times as long as total length of tegmen, with inner sides almost straight and outer sides evenly and weakly narrowing toward rounded apices, provided with 2 kinds of setae, of which one is long and thick, arising from apical 1/3 on dorsal side and concentrated near apex, and the other is short and thin, arising mainly from apical 1/2 of lateroventral sides.

Median lobe gently curved in lateral view; apex roundly acuminate in ventral view; median struts dehiscent from near middle.

Endophallus in lateral view slightly shorter than twice length of median lobe, slightly curved dorsally. Relative lengths of median lobe and endophallus with membrane areas as follow: ML: TLE: BPH: MPH (MT: CT: PB): APH = 5.7: 10.0: 2.8: 5.4 (1.9: 2.7: 0.8): 1.7. MPH with CT delimited from MT and PB by respective constrictions,

slightly swollen ventrally in apical 1/2, thence slightly narrowing basad, weakly curved dorsally; PB short, cylindrical. APH indistinctly delimited from PB, well-developed, swollen together with PB in elongate-cylindrical shape; ED arising from near middle of APH on dorsal side; AS situated on dorsal side of apical area of APH, softly sclerosed and slightly colored. MSp sparsely scattered on MT. LSp short, small, uni-dentate, evenly and densely distributed on CT. SSp small, short, uni-dentate, evenly covering PB. LSp area and MSp area close to each other. SSp area slightly separated from LSp area.

Specimens examined: Ogasawara Is., Tokyo Pref., Japan: 1 ♀ (photographs of holotype housed in CAS), I. Hahajima, 14 May 1934, L. Gressitt coll., type no. 7483; 1 ♂, I. Chichijima, Aug. 1972, M. Iga leg.; 1 ♂, Yoake-yama, Is. Chichijima, collected host on 18 Mar. 2001, reared at Tama-shi, Tokyo Pref., Japan and emerged on 8 June 2001, T. Kurihara leg.

Distribution: Ogasawara Is. (Tokyo Pref., Japan)

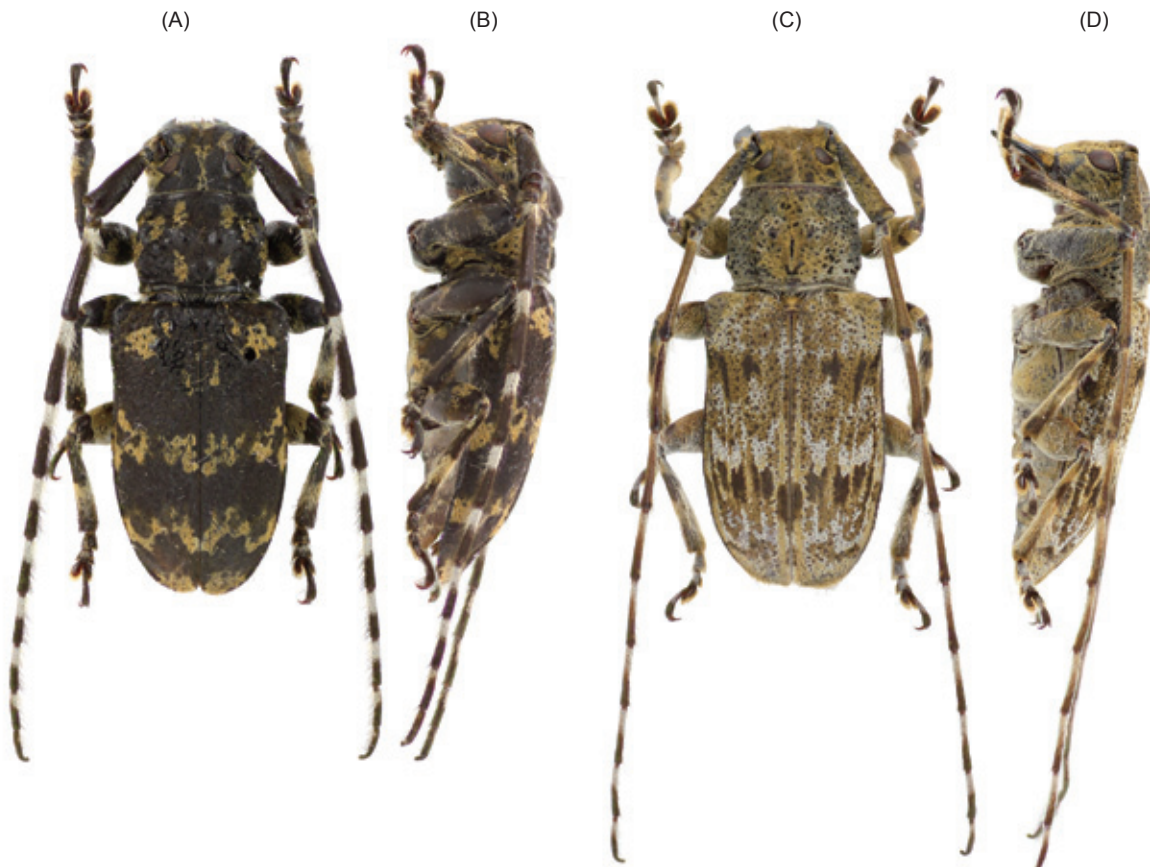


Fig. 2. Male habitus of *Pachyosa* spp. (A, B) *P. cervinopicta*; (C, D) *P. hirtiventris*; (A, C) dorsal view; (B, D) lateral view.

3. *Pachyosa kojimai* (Hayashi, 1974), comb. nov.
(Figs. 3A-B, 5C, 7A-F, 9C, 10C)

Coptops kojimai Hayashi 1974: 37. (type locality: Liukuei, Taiwan).

Mesosa (Saimia) kojimai: Hayashi 1976: 10.

Diagnosis: Body covered with brown pubescence, mingled with pinkish pubescence forming indistinct small patches on pronotal disk, elytral humeri, elytral suture, and femora; elytra with scattered indistinct whitish pubescence forming 3 faded transverse bands behind humeri, near middle, and on apical 1/4, sparsely with small dark-brown spots throughout, provided with a pair of dark-brown maculae on basal 1/3 and 2 narrow discontinuous transverse brown bands on basal and apical 1/3. Each base of 3rd to last segments of antennae annularly with white pubescence; remainder covered with light brown pubescence.

Male genitalia ($n = 2$): Tegmen in ventral view oblong-rhombic, widest just before middle, gently curved in lateral view; ringed part slightly

expanded laterad near middle of tegmen, thence straightly narrowing basad; lateral lobes about 0.2-times as long as total length of tegmen, slightly dehiscent from base to apex, with inner sides almost straight in apical 1/3, thence arcuately and slightly narrowing apicad, and outer sides arcuately narrowed near base, thence almost straight toward rounded apices, provided with 2 kinds of setae, of which one is long and thick, arising from apical 1/3 and concentrated near apex, and the other is short and thin, arising mainly from apical 1/2 of laterodorsal sides.

Median lobe gently curved in lateral view; apex roundly acuminate in ventral view; median struts dehiscent from before middle.

Endophallus in lateral view (partly damaged, in non-inflated condition) slightly shorter than twice length of median lobe. AS situated on dorsal side of apical area of APH, softly sclerosed and slightly colored. MSp sparsely scattered on MT. LSp small, short, uni-dentate, evenly and densely distributed on CT. SSp small, short, uni-dentate,

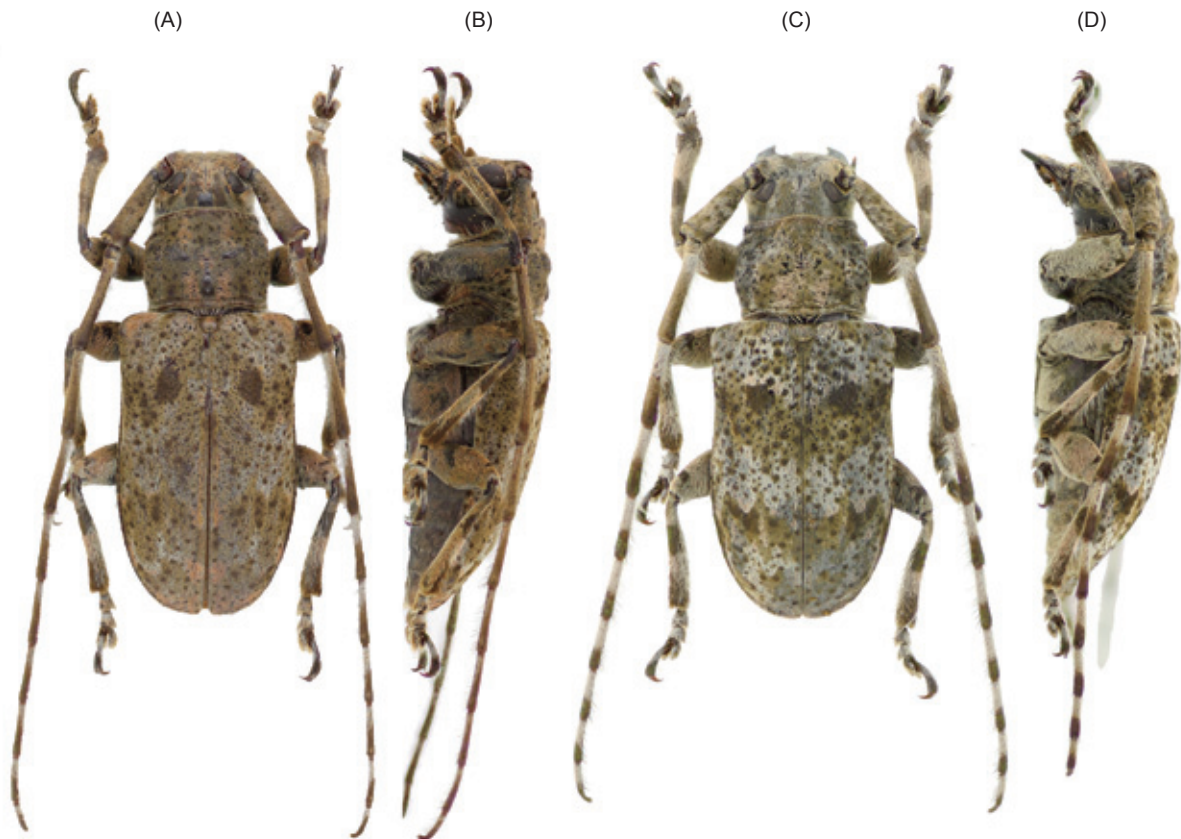


Fig. 3. Male habitus of *Pachyosa* spp. (A, B) *P. kojimai*; (C, D) *P. atronotata atronotata*; (A, C) dorsal view; (B, D) lateral view.

covering almost area of PB. LSp area and MSp area arranged closely to each other. SSp area slightly separated from LSp area.

Specimens examined: 2 ♂♂, 1 ♀, Near Liukuei, Kaohsiung, Taiwan, June 1978, W. Chen leg.

Distribution: Taiwan.

Remarks: The endophallus of this examined specimen was partly broken at the base of the APH. We could not examine the basal part of the APH or endophallus in inflated condition. However, the species closely shares characteristics of its external features and male genital structures with other congeners of *Pachyosa*. Therefore, we treated this species as a member of the genus.

**4. *Pachyosa atronotata* (Kusama et Irie, 1976),
comb. nov.**
(Fig. 10D)

Remarks: This species is distributed in the northeastern part of the Ryukyu Is. Japan, and is divided into 2 subspecies as described below. Here, we limited the description to the nominotypical subspecies only, and that of the other subspecies was omitted.

**4-1. *Pachyosa atronotata atronotata* (Kusama
et Irie, 1976), comb. nov.**
(Figs. 3C-D, 5D, 7G-L, 9D)

Mesosa (Mesosa) atronotata Kusama et Irie 1976: 19, figs. 1a, b. (type locality: I. Nakanoshima, Tokara Is., Kagoshima Pref., Japan).

Mesosa (Saimia) atronotata atronotata: Takakuwa 1988: 10.

Diagnosis: This species is similar to *P. kojimai*, but distinguishable by the following structures: body covered with light grayish-brown pubescence, elytra with scattered small black spots, with a pair of black maculae on basal 1/3, and 2 narrow discontinuous transverse black bands on basal and apical 1/3, with 3 wide transverse white bands behind humeri, near middle, and near apices.

Male genitalia ($n = 1$): Tegmen in ventral view oblong wide-rhombic, widest just before middle, gently curved in lateral view; ringed part slightly expanded laterad near middle of tegmen, thence straightly narrowing basad; lateral lobes about 0.2-times as long as total length of tegmen, with inner sides almost straight apicad and outer sides arcuately narrowing in apical 1/2, thence almost straight toward rounded apices, provided with 2 kinds of setae, of which one is long and thick, arising from apical 1/3, and concentrated near

apex, and the other is short and thin, arising mainly from apical half of lateroventral sides.

Median lobe gently curved in lateral view; apex roundly acuminate in ventral view; median struts dehiscent from before middle.

Endophallus in lateral view about twice length of median lobe, strongly bent dorsally. Relative lengths of median lobe and endophallus with each membrane area as follows: ML: TLE: BPH: MPH (MT: CT: PB): APH = 4.9: 10.0: 2.8: 5.6 (1.6: 3.3: 0.6): 1.6. MPH with CT delimited by feeble constriction from MT and by distinct constriction from PB, very swollen ventrally in apical 1/3, strongly bent dorsally at basal 1/3; PB short, strongly inflected dorsally on dorsal side, obliquely extended from dorsal to ventral side. APH indistinctly delimited from PB, well-developed, very swollen together with PB into elongate-cuboid shape; ED arisen from near middle of APH on dorsal side; AS situated on dorsal side of APH, softly sclerosed and slightly colored. MSp sparsely scattered on MT. LSp small, short, unidentate, sparsely distributed on apical 1/2 of CT and densely on basal 1/2. SSp small, short, unidentate, covering almost area of PB and apical area of APH on ventral side. LSp area and



Fig. 4. Male habitus of *P. itoi*. (A) Dorsal view; (B) lateral view.

MSp area close to each other. SSp area slightly separated from LSp area.

Specimens examined: 1 ♂, 1 ♀, I. Nakanoshima, Tokara Is., Kagoshima Pref., Japan, 11 June 1988 (em. from *Citrus* sp.), K. Mori leg.; 1 ♂, 1 ♀, same data, but 16 June 1989 (em.).

Distribution: I. Nakanoshima (Tokara Is., Kagoshima Pref., Japan).

4-2. *Pachyosa atronotata yamawakii* (Hayashi, 1976), comb. nov.

Mesosa (Saimia) yamawakii Hayashi 1976: 11. (type locality: Nishino-omote, I. Tanegashima, Kagoshima Pref., Japan).
Mesosa (Saimia) atronotata yamawakii: Hayashi 1983: 40.

Specimens examined: 1 ♂, 1 ♀, Nakanoue, I. Tanegashima, 7 Aug. 1982, K. Mori leg.; 1 ♂, 1 ♀, I. Tanegashima, Kagoshima Pref., Japan, reared and emerged, date unknown, K. Mori leg.; 1 ♂, 1 ♀, Nishino-omote, I. Tanegashima, 10 June 1987 (em.), K. Mori leg.

Distribution: I. Tanegashima (Kagoshima Pref., Japan).

5. *Pachyosa itoi* (N. Ohbayashi, 1985), comb. nov.

(Figs. 4A-B, 5E, 8A-F, 9E, 10E)

Mesosa (Saimia) itoi N. Ohbayashi 1985: 1, figs. 1, 2. (type locality: Haneji, I. Okinawa, Japan).

Diagnosis: This species is similar to *P. atronotata*, but distinguishable by the following structures: body covered with yellowish-brown pubescence; pronotum with indistinct pinkish maculae on disc; elytra with 3 indistinct transverse whitish bands behind humeri, near middle, and on apical 1/4; without distinct black maculae behind humeri.

Male genitalia ($n = 2$): Tegmen in ventral view wide-rhombic, widest just before middle, gently curved in lateral view; ringed part slightly expanded laterad near middle of tegmen, thence arcuately narrowing basad; lateral lobes about 0.2-times as long as total length of tegmen, weakly dehiscent from base to apex, with inner sides almost straight in apical 1/3, thence slightly narrowing apicad, and outer sides arcuately narrowing in apical 1/2,

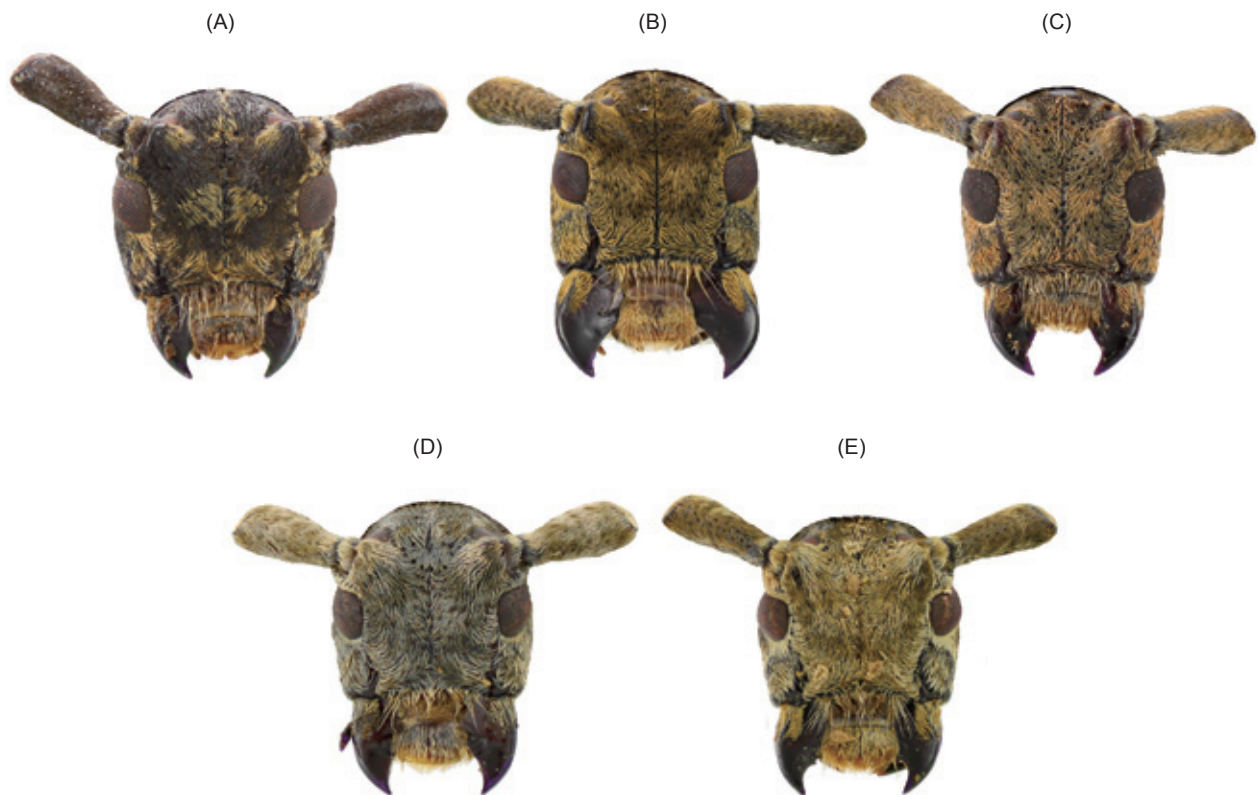


Fig. 5. Male heads of *Pachyosa* spp. in frontal view. (A) *P. cervinopicta*; (B) *P. hirtiventris*; (C) *P. kojimai*; (D) *P. atronotata atronotata*; (E) *P. itoi*.

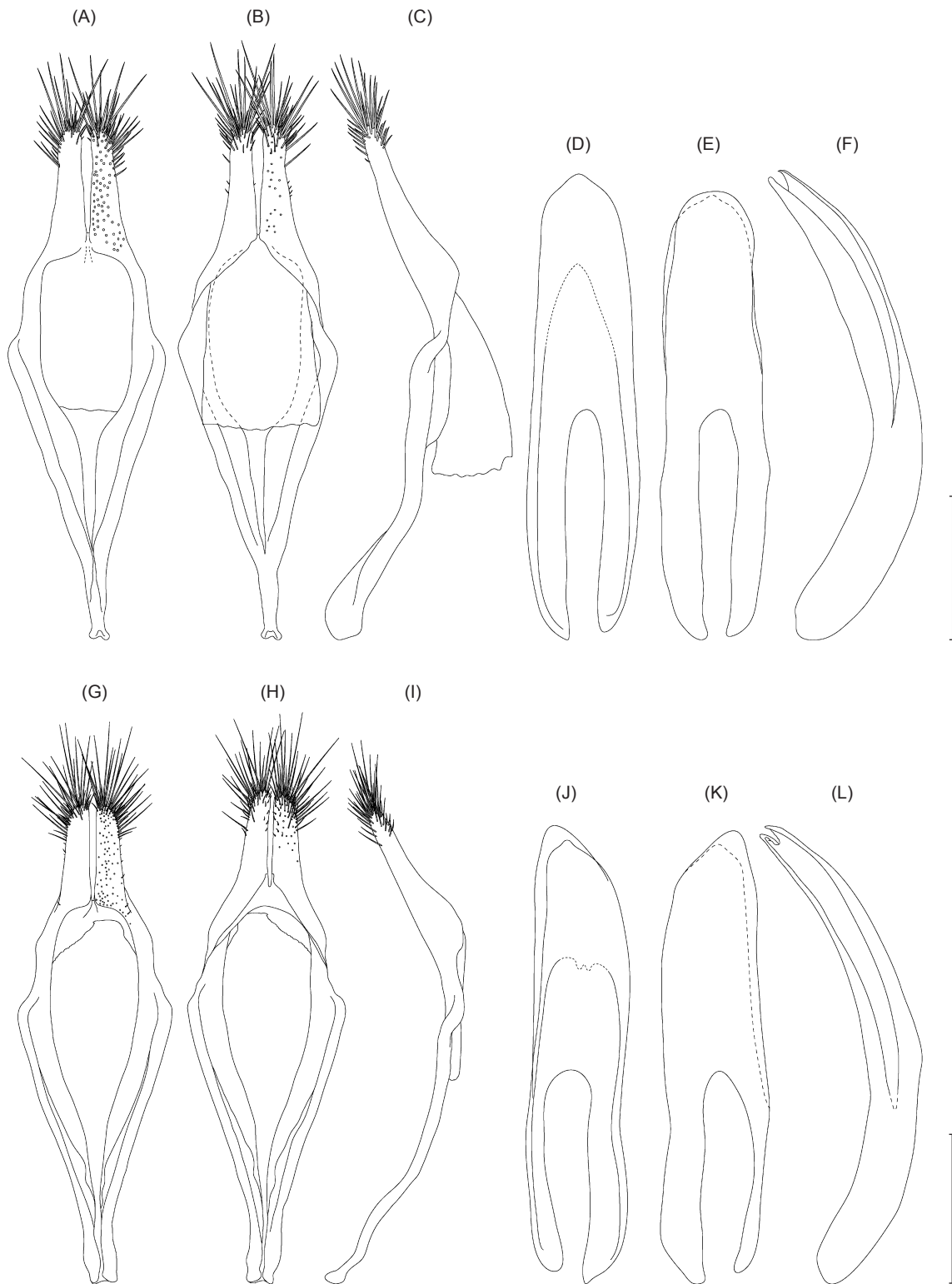


Fig. 6. Male genital organs of *Pachyosa* spp. (A-F) *P. cervinopicta*; (G-L) *P. hirtiventris*; (A, G) tegmen in ventral view; (B, H) ditto in dorsal view; (C, I) ditto in lateral view; (D, J) median lobe in ventral view; (E, K) ditto in dorsal view; (F, L) ditto in lateral view. Scale bars = 1.0 mm.

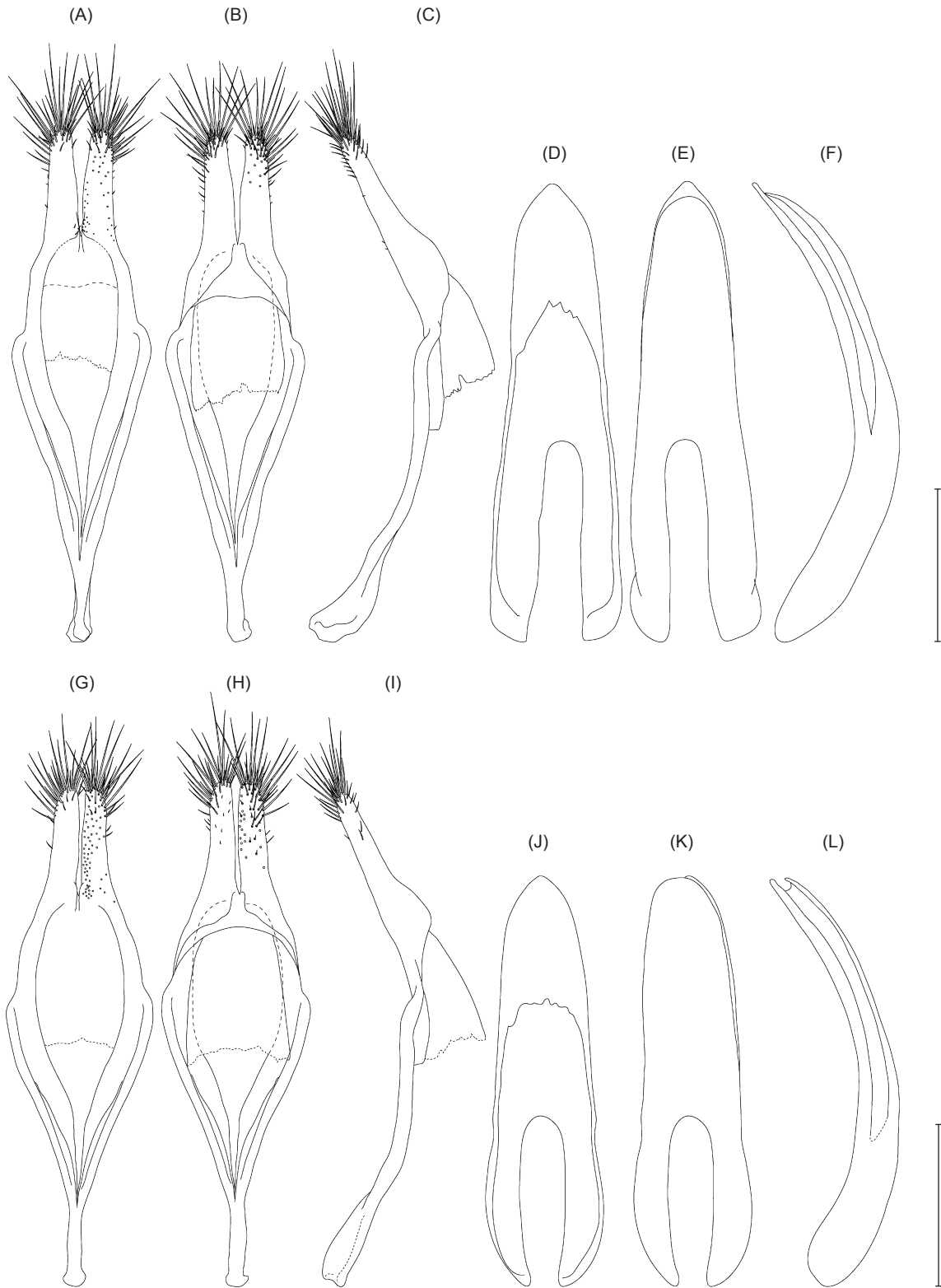


Fig. 7. Male genital organs of *Pachyosa* spp. (A-F) *P. kojimai*; (G-L) *P. atronotata atronotata*; (A, G) tegmen in ventral view; (B, H) ditto in dorsal view; (C, I) ditto in lateral view; (D, J) median lobe in ventral view; (E, K) ditto in dorsal view; (F, L) ditto in lateral view. Scale bars = 1.0 mm.

thence slightly narrowing toward rounded apices, provided with 2 kinds of setae, of which one is long and thick, arising from apical 1/3 and concentrated near apex, and the other is short and thin, arising mainly from apical 1/2 of laterodorsal sides.

Median lobe gently curved in lateral view; apex roundly acuminate in ventral view; median struts dehiscent from behind middle.

Endophallus in lateral view slightly shorter than twice length of median lobe, gently bent dorsally. Relative lengths of median lobe and endophallus with each membrane area as follows: ML: TLE: BPH: MPH (MT: CT: PB): APH = 5.3: 10.0: 3.2: 5.3 (1.5: 3.0: 0.8): 1.5. MPH with CT well-delimited from MT and PB by respective constrictions; weakly swollen ventrally in apical 1/3, gently bent dorsally at apical 1/3; PB short, slightly inflected dorsally on dorsal side, obliquely extended from dorsal to ventral side. APH indistinctly delimited from PB, well developed, very swollen together with PB in rounded-cuboid shape; ED arisen from behind middle of APH on dorsal side; AS situated on dorsal side of apical area of APH, softly sclerosed and slightly colored. MSp sparsely scattered on MT. LSp small, short, unidentate, sparsely distributed on apical 1/3 of CT and densely on basal 1/3. SSp small, short, uni-

dentate, covering almost area of PB and apical area of APH on ventral side. LSp area and MSp area close to each other. SSp area slightly separated from LSp area.

Specimens examined: I. Okinawa, Okinawa Pref., Japan: 1 ♂ (holotype housed in EUMJ), Haneji, collected host plant (*Acacia confusa*) on 4 Apr. 1983, reared at Chiba Pref., and emerged on 20 Sept. 1983, T. Ito leg.; 1 ♂, 3 ♀♀, Takari, Kunigami, 3 July 1963, Y. Kamano leg.; 1 ♂, Haneji, 22 June 1985, M. Kaneda leg.; 1 ♂, Kijoka, Ôgimi-son, May-June 1989 (em.), M. Takeda and Y. Matsumoto leg.; 1 ♂, 2 ♀♀, Takari, Kunigami, 22 June 1993, Y. Kamano leg.; 1 ♀, Ookunibashi, Hiji, Kunigami, 2 June 2000, N. Ohbayashi leg. I. Amami-Ôshima, Kagoshima Pref., Japan: 1 ♂, 1 July 1995, N. Kanie leg.

Distribution: I. Amami-Ôshima (Kagoshima Pref., Japan), I. Okinawa (Okinawa Pref., Japan).

Key to the species of *Pachyosa*

1. Elytra with distinct wide zigzag transverse black bands (I. Ishigaki, I. Iriomote) *P. cervinopicta*
- Elytra with narrow zigzag transverse black bands or without black bands 2
2. Body covered with light yellowish-ocher, but no red, pubescence. Elytra mingled with white and black longi-

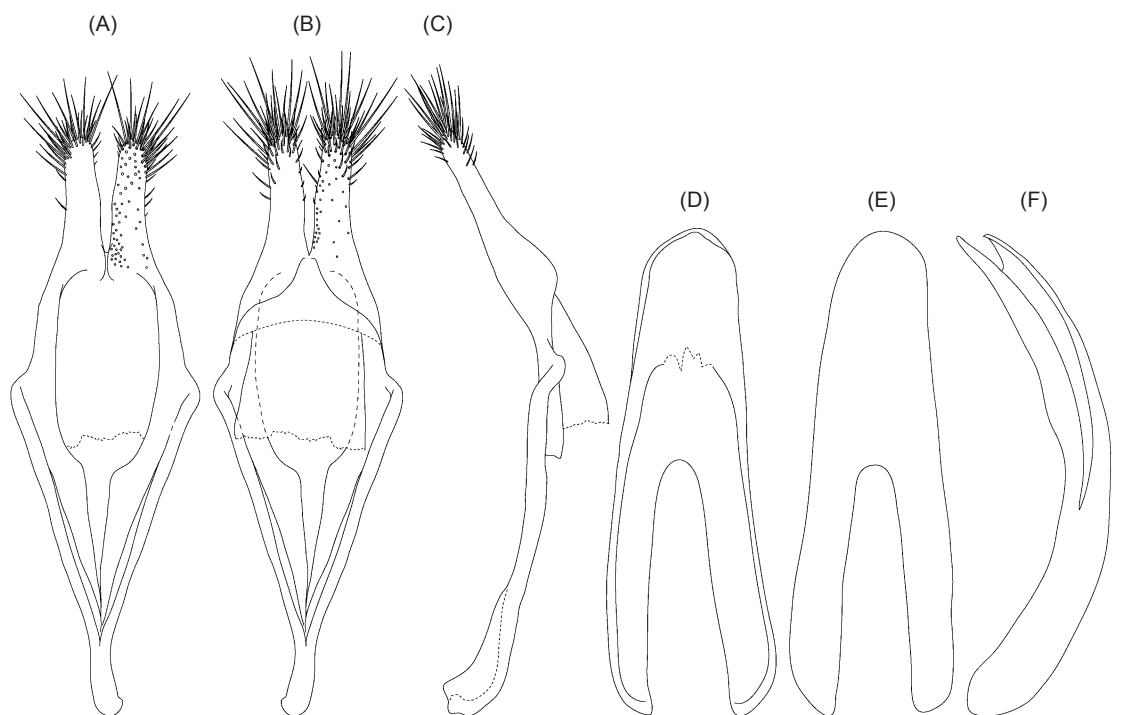


Fig. 8. Male genital organs of *P. itoi*. (A) Tegmen in ventral view; (B) ditto in dorsal view; (C) ditto in lateral view; (D) median lobe in ventral view; (E) ditto in dorsal view; (F) ditto in lateral view. Scale bar = 1.0 mm.

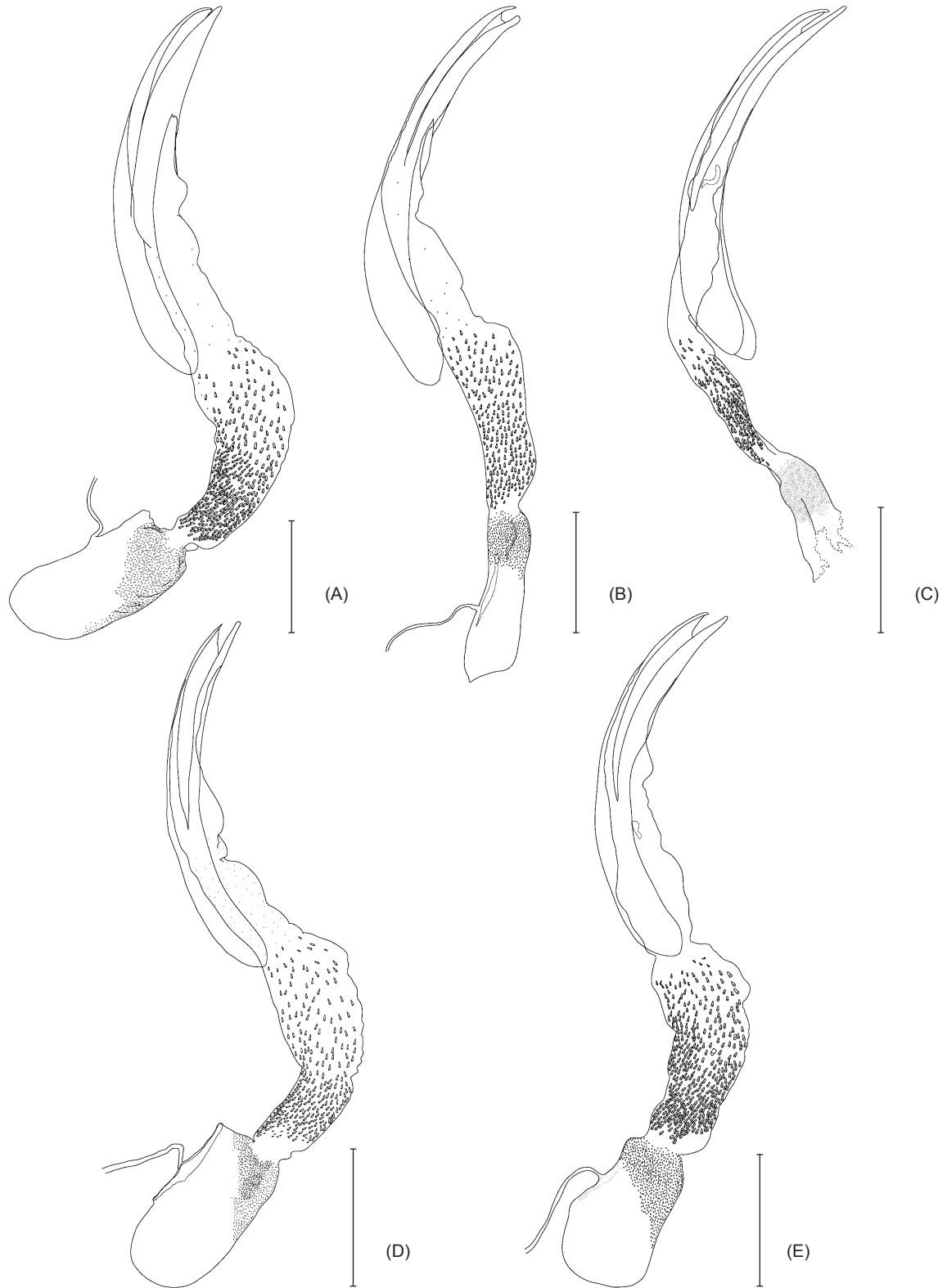


Fig. 9. Median lobes with endophalli of *Pachyosa* spp. in lateral view. (A) *P. cervinopicta*; (B) *P. hirtiventris*; (C) *P. kojimai*; (D) *P. atronotata atronotata*; (E) *P. itoi*. (A, B, D, E) fully inflated condition; (C) non-inflated condition. Scale bars = 1.0 mm.

- tudinal small maculae which alternately form scratchy transverse bands behind humeri and near middle a Ogasawara Is.) *P. hirtiventris*
- Body covered with brown or light brown intermixed with red pubescence. Elytra with wide transverse whitish bands behind humeri and near middle 3
- 3. Elytra covered with brown pubescence (Taiwan) *P. kojimai*
- Elytra covered with yellowish or grayish-brown pubescence 4
- 4. Elytra covered with yellowish-brown pubescence, with indistinct transverse whitish bands behind humeri, near middle, and near apices (I. Amami-Ōshima, I. Okinawa) *P. itoi*
- Elytra covered with grayish-brown pubescence, with distinct wide transverse white bands behind humeri, near middle, and near apices (*P. atronotata*) 5
- 5. Body covered with grayish-brown pubescence which is slightly dark and yellowish. Elytral whitish bands slightly dark and yellowish, slightly inconspicuous (I. Nakanoshima) *P. atronotata atronotata*
- Body covered with light grayish-brown pubescence. Elytral white bands very conspicuous and well contrasting with remainder (I. Tanegashima) *P. atronotata yamawakii*

under the reinstated genus *Pachyosa*. They are thought to be monophyletic and are closely related to each other because they are well sharing the externa structures, male genital features especially in the short, thick endophallus, which is a unique feature among genera of the Mesosini and distinctly differ from the genus *Mesosa*. The genus *Mesosa* is usually characterized by a long, slender endophallus (Yamasako and Ohbayashi 2012).

Two species, previously described by Pic (1917a b) under the genus *Pachyosa*, *P. diversesparsa* and *P. albonotata*, were transferred to the genus *Coptops* Serville, 1835 by Breuning (1938-1940) based on the 3rd antennal segment being shorter than the scape. Also *Mesosa perplexa* Pascoe, 1857 was once combined with the genus *Pachyosa* by Matsushita (1933), then Breuning (1938-1940) returned it to *Mesosa* (*Mesosa*). However, Yamasako and Ohbayashi (2012) transferred it to *Agelasta* (*Dissosira*) Pascoe, 1865. Therefore, these 3 species once combined with *Pachyosa* are surely a different group from the genus.

As shown in figure 10, 5 species of *Pachyosa* show allopatric distribution. Of those, *P. hirtiventris*

DISCUSSION

The unambiguously coherent 5 species, which were included in *Mesosa* (*Saimia*), are placed

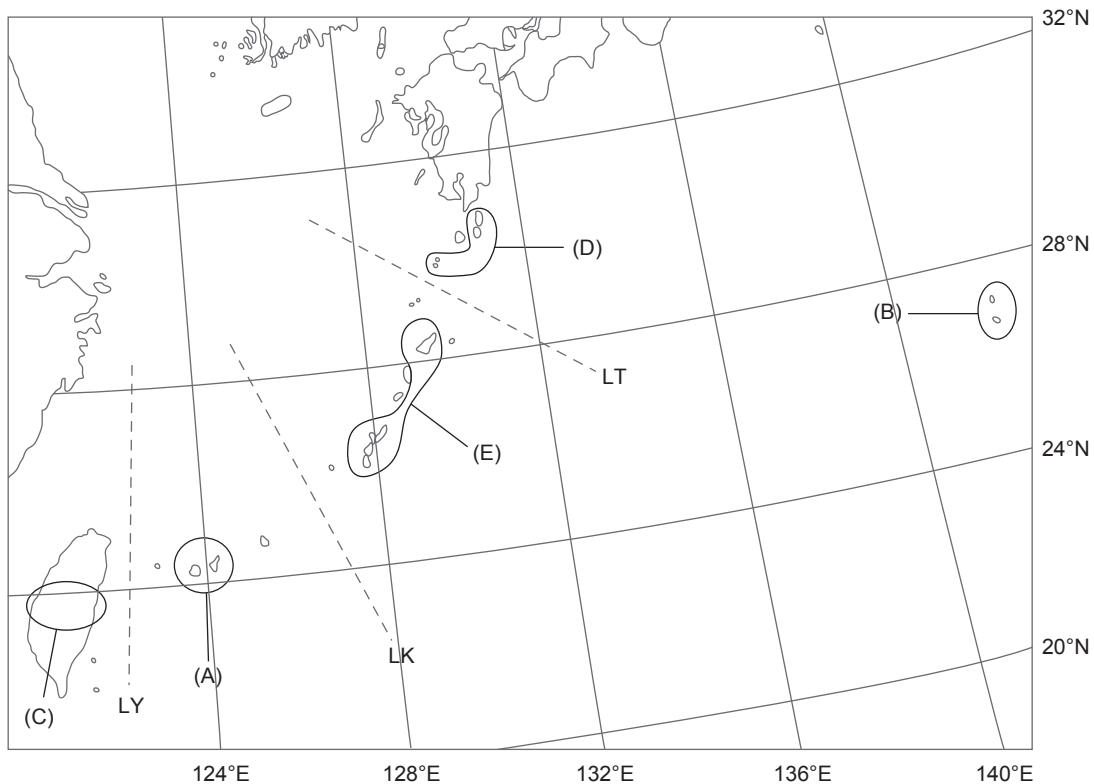


Fig. 10. Distribution map of *Pachyosa* spp. (A) *P. cervinopicta*; (B) *P. hirtiventris*; (C) *P. kojimai*; (D) *P. atronotata*; (E) *P. itoi*. LT, the Tokara Gap; LK, the Kerama Gap; LY, the Yonaguni Gap.

separately inhabits the Ogasawara Is., which comprise a typical oceanic archipelago located in the western part of the North Pacific Ocean approximately 1000 km south of mainland Japan. This fact indicates the possibility of dispersion by the Kuroshio Current which flows northeasterly in the Pacific Ocean and passes the Ryukyu-Taiwan archipelago as was suggested by the cerambycid fauna of there (Kurosawa 1976, Nobuchi and Makihara 1987, Ohbayashi et al. 2007).

The other 4 species are distributed along island chains between I. Tanegashima and Taiwan through the Ryukyu Is., and the distributions are isolated by the geographical boundaries of the Tokara, Kerama, and Yonaguni gaps. Of those 4 species, only *P. atronotata* is distributed in north of the Tokara gap. It is well known that the Tokara gap, which was described as "Watase's line" (e.g. Suzuki 2003), geographically separates the Palearctic Region from the Oriental Region. However, no species of the genus has been recorded from the Japanese mainland or the continental region. Therefore, the speciation of these 4 species is likely to be attributed to the history of the island's formation as was suggested by many biotas of the archipelago (Kimura 2002).

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REFERENCES

- Breuning S. 1938-1940. Études sur les Lamiacées: Huitième tribu: Mesosini Thomson (Col., Cerambycidae). Novit. Ent. 3ème suppl. fasc. **47-66**: 365-526.
- Gressitt J.L. 1937. New Japanese longicorn beetles, II (Coleoptera: Cerambycidae). Kontyû **11**: 317-327.
- Fairmaire L. 1897. Description de six Coléoptères de l'île Ishigaki-Sima. Bull. Soc. ent. Fr. **1897**: 68-72.
- Hayashi M. 1974. New and unrecorded longicorn beetles from Taiwan (Coleoptera: Cerambycidae). Part II. Ent. Rev. Jpn. **27**: 37-62.
- Hayashi M. 1976. Studies on Asian Cerambycidae (Coleoptera) 1. Bull. Osaka Jonan Women's Jr. Coll. **11**: 1-24.
- Hayashi M. 1983. Studies of Asian Cerambycidae (Coleoptera) V. Bull. Osaka Jonan Women's Jr. Coll. **16**: 29-44.
- Hübner J. 1819 [1816-1826]. Verzeichniß bekannter Schmettlinge. Augsburg: bey dem Verfasser zu Finden, 431 + 72 pp.
- Kimura M. 2002. The formation of the Ryukyu Arc and migration of biota to the arc. Naha, Japan: Okinawa Taimusu Sha, 206 pp. (in Japanese with English book title)
- Kurosawa Y. 1976. Beetle fauna of the Bonin Islands, with a consideration on its origin and constitution (2). Gekkan-Mushi **69**: 3-8. (in Japanese with English title)
- Kusama K, H Irie. 1976. Notes on the longicorn genus *Mesosa*, two new species and others from Nansei Islands of Japan. Elytra **3**: 19-22.
- Nobuchi A, H Makihara. 1987. Colonization of coleopterous borers. Nat. Insects **22**: 2-10. (in Japanese with English title)
- Ohbayashi N. 1985. A new species of the genus *Mesosa* from Okinawa Is., Japan (Coleoptera, Cerambycidae). Elytra **12**: 1-3.
- Ohbayashi N. 1992. Taxonomic notes on Japanese Cerambycidae (Coleoptera). Acta Coleopterol. Jpn. **2**: 1-11.
- Ohbayashi N, T Niisato, M Satô. 2007. The cerambycid fauna of Japanese archipelago. In N Ohbayashi, T Niisato, eds. Longicorn beetles of Japan. Tokyo: Tokai Univ. Press, pp. 176-181. (in Japanese)
- Pascoe F.P. 1864-1869. Longicornia Malayana; or, a descriptive catalogue of the species of the three longicorn families Lamiidae, Cerambycidae and Prionidae, collected by Mr. A. R. Wallace in the Malay Archipelago. Trans. entomol. Soc. Lond. **3**: 1-712.
- Pascoe F.P. 1866. Catalogue of longicorn Coleoptera collected in the island of Penang by James Lamb, Esq. Part. I. Proc. zool. Soc. Lond. **1866**: 222-267.
- Pic M. 1917a. Descriptions abrégées diverses. Mém. exot. Ent. **26**: 2-24.
- Pic M. 1917b. Nouveaux Cérambycides [Col.] de la Chine méridionale, III. Bull. Soc. entomol. Fr. **1915**: 353-354.
- Suzuki E. 2003. Geographic division. In Y Iwasa, T Matsumoto, K Kikuzawa, the Ecological Society of Japan, eds] Encyclopedia of ecology. Tokyo: Kyoritsu Shuppan, pp. 403-406. (in Japanese)
- Takakuwa M. 1988. Additional notes to "Longicorn-Beetles of Japan in Col." in 1984. Gekkan-Mushi **204**: 4-14. (in Japanese)
- Yamasako J, N Ohbayashi. 2011. Review of the genus *Paragolsinda* Breuning, 1956 (Coleoptera, Cerambycidae, Lamiinae, Mesosini), with reconsideration of the endophallic terminology. Zootaxa **2882**: 35-50.
- Yamasako J, N Ohbayashi. 2012. Taxonomic position of the oriental species of *Mesosa* (*Mesosa*) (Coleoptera, Cerambycidae, Lamiinae, Mesosini). Psyche **2012**, Article ID 467949, 15 pp, doi: 10.1155/2012/467949.