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Additional Records of Clytine Species (Coleoptera, Cerambycidae) from the Ogasawara Islands (3)

Revised Notes on the *Chlorophorus* Species from Muko-jima Island[1)]

Tatsuya NIISATO

Bioindicator Co., Ltd., Yarai-chô 126, Shinjuku, Tokyo, 162–0805 Japan

and

Haruki KARUBE

Kanagawa Prefectural Museum of Natural History,
499 Iryuda, Odawara, Kanagawa, 250–0031 Japan

Abstract Two *Chlorophorus* species from Muko-jima Island of the Ogasawara Islands are revised. *Chlorophorus masatakai* and *C. kusamai* are illustrated and redescribed based on the holotype and additional specimens.

Introductory Review

Chlorophorus kusamai was described on the basis of the male holotype specimen collected from Muko-jima Island of the Ogasawara Islands on May 22, 1974, and was suggested in the original description (SATÔ, 1999) as a relative of *C. kobayashii* KOMIYA from the Chichi-jima and Haha-jima groups of the same islands. Several years after SATÔ's description, NIISATO and KARUBE (2000, 2002), additionally recorded *C. kusamai* on the basis of a series of specimens collected by recent field survey of Muko-jima Island, and redescribed and illustrated its habitus and male genital organ in comparison with *C. kobayashii*. They also recorded *C. boninensis* KANO from the same island and suggested the peculiarities in the pale brown pubescent body with reduced black maculation on the pronotum and elytra.

Misarrangement was cleared by reexamination of the male genital organ of *C. kusamai*. During the study of the *Chlorophorus* species from the Ogasawara Islands, KARUBE found out the difference in male genital organ between "*C. kusamai*" at hand and the illustration in SATÔ's original description; the parameres were drawn as slender

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and shallowly dehiscent ones in SATÔ's text-figure, while in "*C. kusamai*" at hand they show a broad, robust and deeply dehiscent form related to those of *C. kobayashii*, as was reported in our previous paper (NIISATO & KARUBE, 2000, p. 440, fig. 9). SATÔ's illustration seems to show a closer relationship to those of *C. boninensis*. It is most probable that *C. kusamai* is not a species related to *C. kobayashii* as was suggested in the original description.

The question was easily solved by examination of the holotype of *C. kusamai*. As was expected, the true *C. kusamai* no doubt belongs to the same lineage as *C. boninensis* and is regarded as a sibling species on Muko-jima Island. On the other hand, our "*C. kusamai*" at hand was an undescribed species truely allied to *C. kobayashii*, and recently described under the name of *C. masatakai* (NIISATO & KARUBE, 2006).

The realtion and distribution of these Ogasawara species belonging to the group of *C. yayeyamensis* are summarized again as follows:

Subgroup of *C. boninensis*

C. boninensis KANO: Chichi-jima Is. ?, Otôto-jima Is., Ani-jima Is., Nishi-jima Is. and Minami-jima Is. (Chichi-jima group), Haha-jima Is., Mukou-jima Is., Ane-jima Is. and Mei-jima Is. (Haha-jima group).

C. kusamai M. SATÔ: Muko-jima Is. (Muko-jima group).

Subgroup of *C. kobayashii*

C. kobayashii KOMIYA: Otôto-jima Is., Ani-jima Is., Higashi-jima Is., Chichi-jima Is. (Chichi-jima group), Haha-jima Is., Mukou-jima Is., Ane-jima Is., Imôto-jima Is. and Mei-jima Is. (Haha-jima group).

C. masatakai NIISATO et KARUBE: Muko-jima Is. and Nakôdo-jima Is. (Muko-jima group).

In the following lines, we are going to revise two *Chlorophorus* species from the Muko-jima group of the Ogasawara Islands based upon the above reexamination.

The present paper is dedicated to the late Dr. Masataka SATÔ who unexpectedly passed away in the summer of 2006. He was interested in the coleopteran fauna of the Ogasawara Islands, particularly from the zoogeographical viewpoint, and also gave many useful suggestions for our collaborative studies. We described *C. masatakai* from Muko-jima Island as the last dedication to his entomological life (Elytra, Tokyo, **34**, p. 222).

Chlorophorus kusamai M. SATÔ, 1999

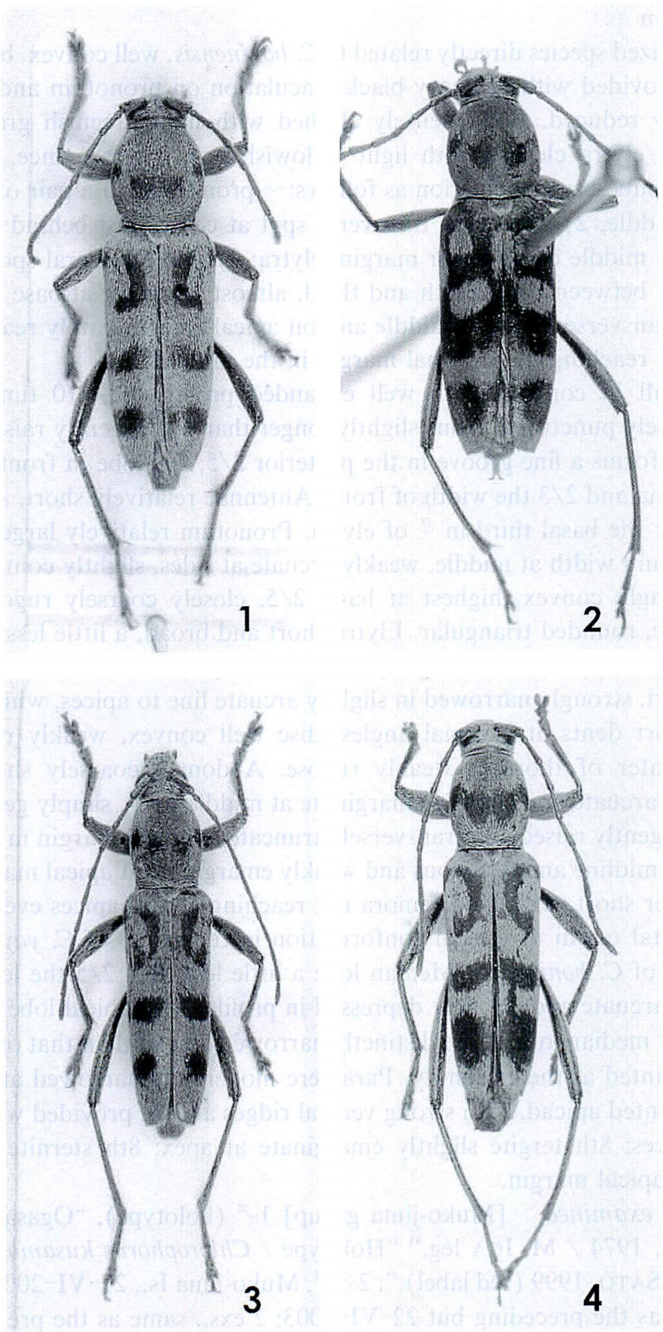
[Japanese name: Mukojima-tora-kamikiri]

(Figs. 1, 5)

Chlorophorus kusamai M. SATÔ, 1999, Elytra, Tokyo, **27**, p. 47, figs. 1–3; type locality: Muko-jima, Ogasawara Islands.

Chlorophorus boninensis: NIISATO & KARUBE, 2000, Elytra, Tokyo, **28**, p. 441, fig. 8.

Body length (measured from apical margin of clypeus to elytral apices) 9.0–9.5 mm



Figs. 1–4. *Chlorophorus kusamai* M. SATÔ, *C. masatakai* NIISATO et KARUBE and their relatives, ♂ holotypes. —— 1, *C. kusamai* from Muko-jima Is.; 2, *C. boninensis* KANO from "Ogasawara-jima"; 3, *C. masatakai* from Muko-jima Is.; 4, *C. kobayashii* KOMIYA from Haha-jima Is.

in ♂, 9.6 mm in ♀.

Medium-sized species directly related to *C. boninensis*, well convex, black in most of integument, provided with ordinary black maculation on pronotum and elytra though rather strongly reduced. Body densely clothed with light greenish gray pubescence. Pronotum and elytra clothed with light yellowish brown pubescence, provided with reduced black pubescent maculation as follows:— pronotum: 1) a pair of small spots at sides of the middle, 2) somewhat transverse spot at centre just behind middle, deeply angulate at the middle of posterior margin; elytra: 3) small humeral spot, 4) L-shaped band at a level between basal tenth and third, almost attaining at base to the humeral spot, 5) two transverse bands at middle and on apical fourth, barely reaching both the margins or not reaching the external margin in the middle.

Head small in contrast with well expanded pronotum, 0.70 times as wide as pronotum, closely punctured; frons slightly longer than wide, gently raised towards the midline which forms a fine groove in the posterior 2/5; eye-lobe in frontal view a little deeper than gena and 2/3 the width of frons. Antennae relatively short, attaining to the middle in ♂ or the basal third in ♀ of elytra. Pronotum relatively large, 1.25 times as wide as maximum width at middle, weakly arcuate at sides, slightly contracted to apex, with disc strongly convex, highest at basal 2/5, closely coarsely rugose on surface. Scutellum large, rounded triangular. Elytra short and broad, a little less than 2.0 times as long as the humeral width, slightly wider than pronotum; sides with completely rounded humeri, strongly narrowed in slightly arcuate line to apices, which are oblique, with blunt short dents at external angles; disc well convex, weakly rugose than on pronotum. Venter of thoraces weakly rugose. Abdomen coarsely shagreened; anal ventrite gently arcuate and slightly emarginate at middle in ♂, simply gently arcuate in ♀; anal tergite gently raised and transversely truncate at apical margin in ♂, moderately raised towards midline and declivous and weakly emarginate at apical margin in ♀. Legs stout and rather short, with hind femora not reaching elytral apices even in ♂.

Male genital organ of typical conformation in the group of *C. yayeyamensis* and similar to that of *C. boninensis*. Median lobe a little less than 2/5 the length of elytra, rather weakly arcuate and strongly depressed in profile, with apical lobe nearly 1/2 the whole length of median lobe, more distinctly narrowed apicad than that of *C. boninensis*, and shortly pointed at the extremity. Paramere moderately narrowed at external sides and bluntly pointed apicad, with strong ventral ridges at 3/8, provided with dense short setae near apices; 8th tergite slightly emarginate at apex; 8th sternite widely deeply emarginate at apical margin.

Specimens examined. [Muko-jima group] 1♂ (holotype), "Ogasawara / Muko-jima / 22 May, 1974 / M. IGA leg." "Holotype / *Chlorophorus kusamai* M. SATÔ, sp. nov. / Det. M. SATÔ, 1999 (red label)."; 2♂♂, Muko-jima Is., 27–VI–2000, H. KARUBE leg.; 1♀, same as the preceding but 22–VI–2003; 2 exs., same as the preceding but 12–VI–2003.

Comparative specimens examined of C. boninensis. 1♀ (holotype), "Ogasawara-jima / leg SAWADA (written by KANO)" "*Chlorophorus boninensis* KANO (pink label

written by KANO)" "NSMT-I-C/17278" "HOLOTYPE/*Chlorophorus boninensis* KANO, 1933 (red label written by Y. KUROSAWA)." The true locality of the holotype is most probably Haha-jima Island. [Chichi-jima group] 1♀, Otôto-jima Is., 20–VI–2000, H. KARUBE leg.; 1♂, Shikano-hama, Otôto-jima Is., 25–VI–2005, H. KARUBE leg.; 1♂, Shikano-hama — Hirone, Otôto-jima Is., 12–VI–2006, H. KARUBE leg.; 1♀ & 2 exs., Nishi-jima Is., 25–VI–2003, H. KARUBE leg.; 1♂, Uguisu-hama-ue, Ani-jima Is., 27–VI–1998, M. TAKAKUWA leg.; 1 ex., southern area, Ani-jima Is., 25–VI–2001, H. KARUBE leg.; 1 ex., Mansakuhama — Daichi, Ani-jima Is., 4–X–2003, H. KARUBE leg.; 1♂, 1♀, Minami-jima Is., 22–V–2002, K. HORIKOSHI leg.; 5♂♂, 1♀, same island as the preceding, 1–X–2004, H. KARUBE leg. [Haha-jima group] 1♂, Mt. Kuwanoki, Haha-jima Is., 24–VI–1976, M. TAKAKUWA leg.; 2♂♂, Hasu-ike, Haha-jima Is., 23–IX–1989; 1 ex., Shizuka-zawa, Haha-jima Is., 14–VI–2003, S. SUDA leg.; 2 exs., 24–VI–2000, Mukai-jima Is., H. KARUBE leg.; 1 ex., Mukai-jima Is., 10–VI–2001, S. ÔMURA leg.; 2 exs., 12–VI–2003, H. KARUBE leg.; 2 exs., Mei-jima Is., 13–VI–2003, H. KARUBE leg.; 1♂, Ane-jima Is., 19–VI–1999, H. KARUBE leg.

Distribution. Ogasawara Isls.: Muko-jima Is. (Muko-jima group).

Notes. It is doubtless that *C. kusamai* is a species having closer relationship to *C. boninensis* from the Chichi-jima and Haha-jima groups. Two allopatric species share such unique male genital organ as the narrow and briefly dehiscent parameres. *Chlorophorus kusamai* is not so much specialized in the male genital organ from *C. boninensis* and only distinguished from the latter by the more distinctly narrowed apical lobe of median lobe and paramere, more distinct emargination at apices of 8th tergite and sternite. From the pale brown pubescence, *C. kusamai* is easily separable from *C. boninensis*, though such colored pubescence may be an ancestral state and reminds us of *C. yayeyamensis* KANO of the same lineage mainly from the Ryukyu Islands. In the rather specialized species, *C. boninensis*, the colour of pubescence becomes gradually reddish towards north to south in the Ogasawara Islands.

This species seems to be rare since we were able to collect only five additional specimens in spite of our repeated visits to Muko-jima Island during 1999–2006. *Chlorophorus ogasawarensis* is also generally rare in the habitat, only excepting Minami-jima Island of the Chichi-jima group where *C. ogasawarensis* is one of the dominant cerambycid species. It may have been caused from non-existence of competition with sympatric clytine belonging to the subgroup of *C. kobayashii*, since any species of the subgroup does not occur in Minami-jima Island.

Chlorophorus masatakai NIISATO et KARUBE, 2006

[Japanese name: Mukojima-kiiro-tora-kamikiri]

(Figs. 3, 7)

Chlorophorus masatakai NIISATO et KARUBE, 2006, Elytra, Tokyo, **34**, p. 222; type locality: Muko-jima Is., Ogasawara Isls.

Chlorophorus kusamai: NIISATO & KARUBE, 2000, *ibid.*, **28**, p. 440, figs. 4–5, 10; 2002, *ibid.*, **30**, p. 254;

KARUBE, *et al.*, 2004, Res. Rept. Kanagawa pref. Mus. nat. Hist., (12), p. 78.

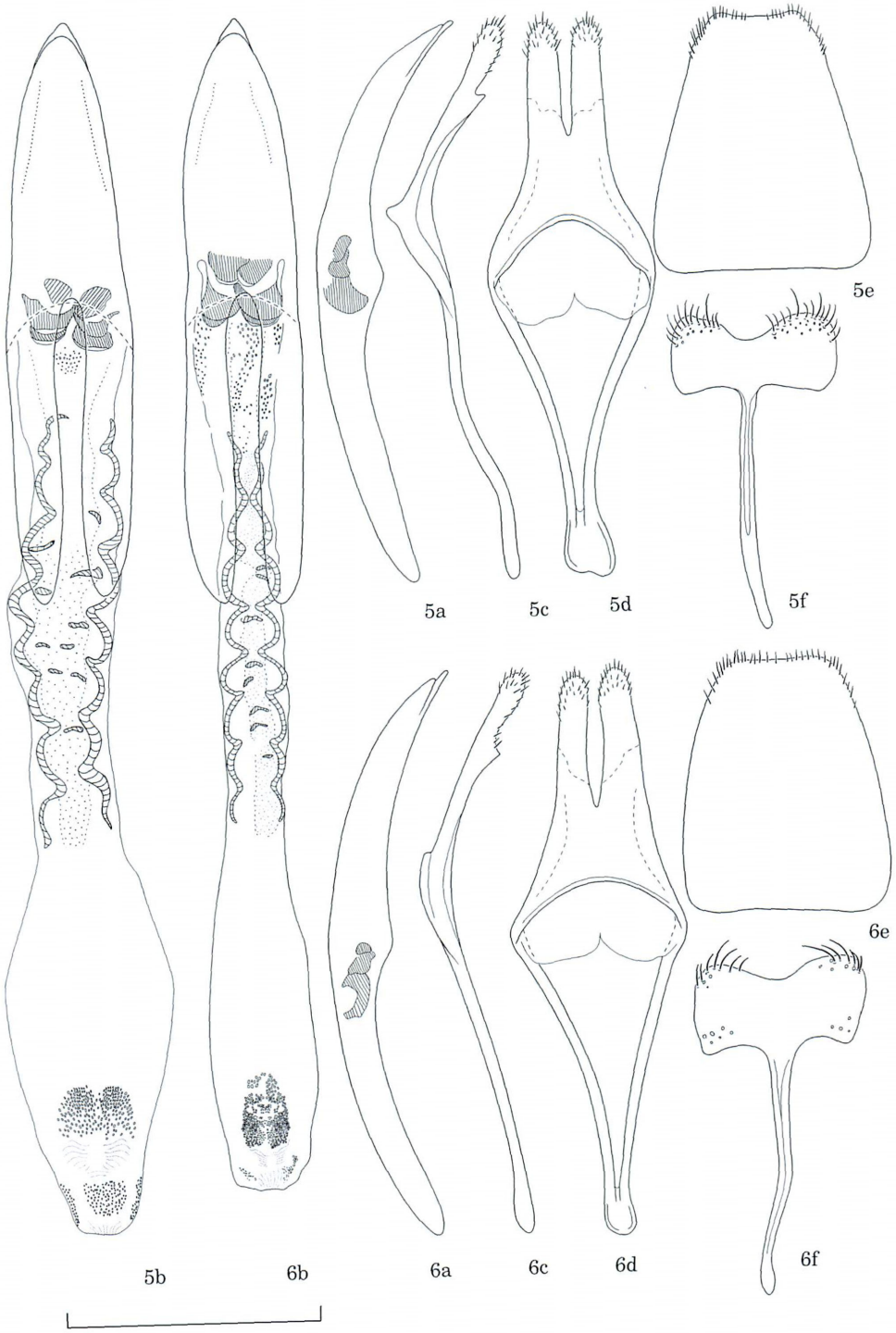
Body length (measured from apical margin of clypeus to elytral apices) 8.4–10.6 mm in ♂, 9.2–12.0 mm in ♀.

Similar in dorsal maculation to the preceding species but doubtless belongs to the same lineage as *C. kobayashii*. Medium-sized, moderately convex, black in most of integument. Body densely clothed with light greenish gray pubescence. Pronotum and elytra clothed with light greenish yellow pubescence, though slightly darker on pronotum, provided with reduced black pubescent maculation as follows:— pronotum: 1) a pair of small spots at sides just before middle, 2) pair of spots at centre just behind middle, becoming larger and approximate or small and fairly apart according to individuals; elytra: 3) small humeral spot, 4) J-shaped band at a level between basal 1/20 and 3/10, fairly apart at base from the humeral spot, sometimes divided into two isolated spots, 5) two incomplete transverse bands at middle and on apical fourth, almost always reaching both the margins.

Head moderate including well prominent eyes, more than 0.75 times as wide as pronotum, weakly rugose; frons 1.2 times as wide as long, weakly raised towards midline which forms a weak costa in posterior 2/5; eye-lobe in frontal view nearly equal in depth to gena and 3/4 the width of frons. Antennae fine and rather long, attaining to apical third in ♂ or just behind middle in ♀ of elytra. Pronotum moderate, slightly longer than the maximum width at middle, gently arcuate at sides, moderately contracted to apex, with disc rather distinctly convex, highest at basal 3/8, closely coarsely rugose on surface. Scutellum large, rounded triangular. Elytra moderate in length, about 2.3 times as long as the humeral width, 1.25 times as wide as pronotum; sides with humeri somewhat roundly expanded, subparallel to middle then slightly arcuate to apices, which are oblique, with short blunt dents at external angles; disc moderately convex, weakly rugose. Venter of thoraces weakly rugose. Abdomen coarsely shagreened; anal ventrite impressed along midline in apical half and slightly arcuate at margin in ♂, almost transversely truncate in ♀; anal tergite weakly raised and transversely truncate with very shallow emargination at middle of apical margin in ♂, slightly raised and declivous and weakly emarginate at apical margin in ♀. Legs rather slender and long, with hind femora slightly exceeding elytral apices in ♂.

Male genital organ basically similar to that of *C. kobayashii*. Median lobe a little more than 7/20 the length of elytra, hardly arcuate in profile, with shorter apical lobe which is 4/9 the whole length of median lobe, gently narrowed apicad, bluntly rounded at apex of dorsal plate. Parameres large, constricted near basal fifth, then markedly broadened before apices, narrowly but deeply dehiscent in apical 5/6, provided with

Figs. 5–6. Male genital organ of *Chlorophorus kusamai* M. SATÔ from Muko-jima Is. (5) and *C. boninensisi* KANO from Haha-jima Is. (6). —— a, Median lobe in lateral aspect; b, ditto in dorsal aspect; c, tegmen in lateral aspect; d, ditto in dorsal aspect; e, 8th abdominal tergite in dorsal aspect; f, 8th abdominal sternite in ventral aspect. Scale 1 mm.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ventral ridges at basal 2/5; 8th tergite transversely truncate at apex; 8th sternite almost bi-lobed, deeply concave at middle of apical margin.

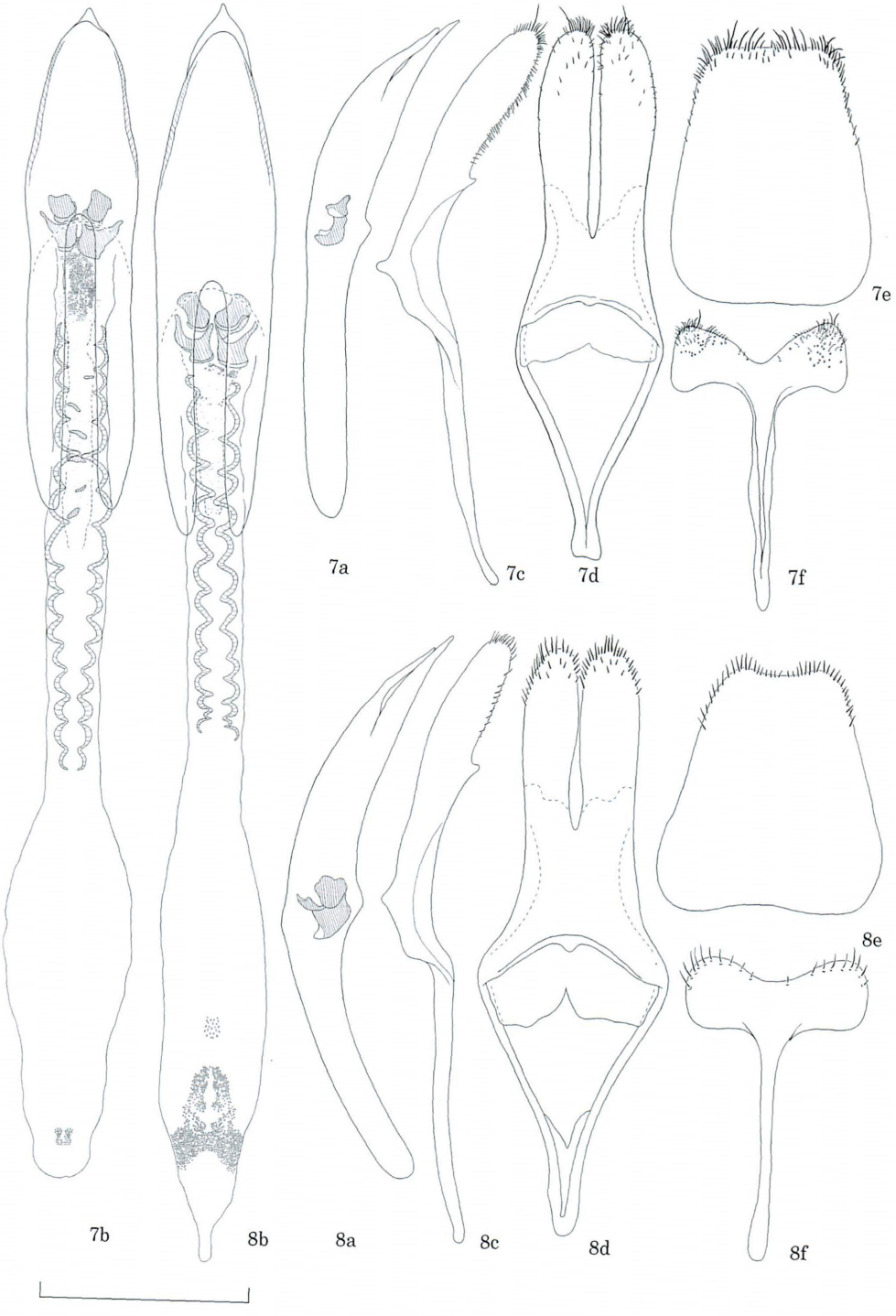
Specimens examined. 25♂♂, 8♀♀ from Muko-jima Is. and 1♀ from Nakôdo-jima Is., Ogasawara Isls. (the type series including the holotype, and the collecting data in detail are shown in NIISATO & KARUBE (2006, p. 222); 1♂, 1♀, near Ôyama, Muko-jima Is., 18–VI–2006, H. KARUBE leg.; 1♂, 1♀, almost of the same data as the preceding but southern area of Muko-jima Is.

Comparative specimens examined of C. kobayashii. [Chichi-jima group] 1 ex., Kuro-hama — Ichino-tani, Otôto-jima Is., 29–VI–1998, M. TAKAKUWA & H. KARUBE leg.; 4♂♂, northern area, Otôto-jima Is., 19–VI–1999, H. KARUBE leg.; 13 exs., almost same data as the preceding but 20–VI–1999; 3♂♂, 3♀♀, Otôto-jima Is., 20–VI–1999, H. KARUBE leg.; 1♀, almost same data as the preceding but 20–VI–2000; 1♂, 2♀♀, Kuro-hama — Ichino-tani, Otôto-jima Is., 16–VI–2003, H. KARUBE leg.; 1♂, Shikano-hama — Hirone, Otôto-jima Is., 17–VI–2003, H. KARUBE leg.; 2♂♂, 1♀, same locality and collector but 20–VI–2003; 2♂♂, 1♀, Mansaku — Daichi, Ani-jima Is., 15–VI–2001, H. KARUBE leg.; 2♂♂, Mansaku-hama, Ani-jima Is., 25–VI–2001, H. KARUBE leg.; 2 ♂♂, southern area, Ani-jima Is., 25–VI–2001, M. TAKAKUWA leg.; 1♂, Mansaku — Daichi, Ani-jima Is., 4–V–2003, H. KARUBE leg.; 3♂♂, 1♀, same locality, 4–X–2003, H. KARUBE leg. [Haha-jima group] 1♂(holotype), "Holotype (orange label)" "Haha-jima Is. / Nagahama — Kitamura /13～15–X–1973 / T. KOBAYASHI leg." "*Chlorophorus kobayashii* KOMIYA, 1976 / Holotype (red label) (all written by Z. KOMIYA); 2♀♀, Hasu-ike, Haha-jima Is., 23–IX–1989; 1♀, Shizuka-zawa, Haha-jima Is., 14–VI–2003, S. SUDA leg.; 2♀♀, Mukou-jima Is., 24–VI–2000, H. KARUBE leg.; 1♀, same island as the preceding, 10–VI–2001, M. TAKAKUWA leg.; 1♂, 2♀♀, same island as the preceding, 12–VI–2003, H. KARUBE leg.; 1♀, same island as the preceding, emerged from host on V～VII–2005, H. KARUBE leg.; 1♀, Ane-jima Is., 15–VI–2003, H. KARUBE leg.; 1♂, Imôto-jima Is., 22–VI–2006, H. KARUBE leg.; 3♂♂, same island, emerged out from host in VI–2006, H. KARUBE leg.; 1♂, 2♀♀, Mei-jima Is., 13–VI–2003, H. KARUBE leg.

Distribution. Ogasawara Isls.: Muko-jima Is. and Nakôdo-jima Is. (Muko-jima group).

Notes. This species was erroneously recorded as *C. kusamai*: due to a misidentification based on the original description (NIISATO & KARUBE, 2000, 2002). We thoughtlessly believed in the comparative comment of the description and concluded that *C. kusamai* is a species related to *C. kobayashii*. Recently, we examined the holotype of *C. kusamai* preserved in the Entomological Laboratory, Ehime University, and realized that it belongs to the lineage of *C. boninensis*. Therefore, the *Chlorophorus* species in question was described as a new species of the lineage of *C. kobayashii* in our

Figs. 7–8. Male genital organ of *Chlorophorus masatakai* NIISATO et KARUBE from Muko-jima Is. (7) and *C. kobayashii* KOMIYA from Haha-jima Is. (8). —— a, Median lobe in lateral aspect; b, ditto in dorsal aspect; c, tegmen in lateral aspect; d, ditto in dorsal aspect; e, 8th abdominal tergite in dorsal aspect; f, 8th abdominal sternite in ventral aspect. Scale 1 mm.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recent paper (NIISATO & KARUBE, 2006).

Though sharing many respects, the two sibling species, *C. masatakai* and *C. kobayashii* KOMIYA, are easily distinguished from each other by not only the black maculation on the elytra but also their specialized male genital organs. The apical part of the median lobe in *C. masatakai* is completely rounded and exposing the extremity of the ventral plate, instead of simply narrowed one in *C. kobayashii*. It is also evident in the conformation of the paramere which is markedly elongate and broadened to apical 2/5 in *C. masatakai*, though rather weakly so in *C. kobayashii.* Light greenish brown pubescence and reduced black pubescent maculation in *C. masatakai* are easily recognizable characters discriminating it from *C. kobayashii.* Such a pubescent pattern is almost perfectly identical in two sympatric *Chlorophorus* on Muko-jima Island, *C. masatakai* and *C. kusamai*, and seems to have been caused by convergence in the small habitat of the island group.

Chlorophorus masatakai is the most dominant species in all the three clytines recorded from Muko-jima Island, because of rather a long series of specimens listed above were obtained by our previous surveys after the 2000's. Adult clytines are usually found on the blossoms of *Terminalia catappa*, and also known from *Cirium boninense* by a collecting record. *Planchonella obovata* is one of the main host plants of the clytine, since the female usually lays eggs on the bark surface and the adults emerged out from dead trunks. *Xylotrechus ogasawarensis* KANO also uses *P. obovata* as host plant on Muko-jima Island.

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We wish to express our hearty thanks to the late Dr. Masataka SATÔ of Nagoya, Drs. Nobuo OHBAYASHI of the Entomological Laboratory, Ehime University, Matsuyama, and Masatoshi TAKAKUWA of the Kanagawa Prefectural Museum of Natural History, Odawara, Shûhei NOMURA of the National Science Museum (Nat. Hist.), Tokyo, for their usuful suggestion and/or help in examining the valuable specimens including the types, and also to Dr. Koichi MATSUMOTO, Shinichi SUDA, for their kind cooperation in the field. Special thanks are also due to Dr. Shun-Ichi UÉNO for his constance guidance and critical review of the original manuscript of this paper.

要　　約

新里達也・苅部治紀：小笠原諸島におけるトラカミキリの記録 (3). 聟島列島のクロトラカミキリ属に関する追加知見と訂正. —— 小笠原諸島北部の聟島列島に分布するクロトラカミキリ属 *Chlorophorus* の 2 種，ムコジマトラカミキリ *C. kusamai* M. SATÔ とムコジマキイロトラカミキリ *C. masatakai* NIISATO et KARUBE に関する知見の追加と訂正を，その研究の経緯も併せて報告した．ムコジマキイロトラは NIISATO & KARUBE (2000, 2002) などによってムコジマトラの誤同定のもとに再記録されていたが，同著者によって最近になってオガサワラキイロトラカミキリに近

縁な新種として記載命名された．いっぽう，ムコジマトラは原記載ではオガサワラキイロトラに近縁とされていたが，真実は *C. kobayashii* KOMIYA の聟島における代置種である．聟島列島におけるクロトラカミキリ属の両種について，それぞれ父島列島と母島列島に分布する代置種との比較のもとに，雄交尾器を含めた詳細な再記載を行った．

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