

Two New Species of the Genus *Clavicornaltica* (Coleoptera, Chrysomelidae, Galerucinae) from Taiwan and Ishigaki-jima Island, Japan

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Abstract Two new species of flea beetles, *Clavicornaltica mizusawai* n. sp. from Taiwan and *C. sakishimana* n. sp. from Ishigaki-jima Is., Japan and Taiwan are described. *Clavicornaltica takimotoi* LESAGE, 1997 is additionally described. The genus *Clavicornaltica* SCHERER, 1974 is recorded for the first time from Japan.

Introduction

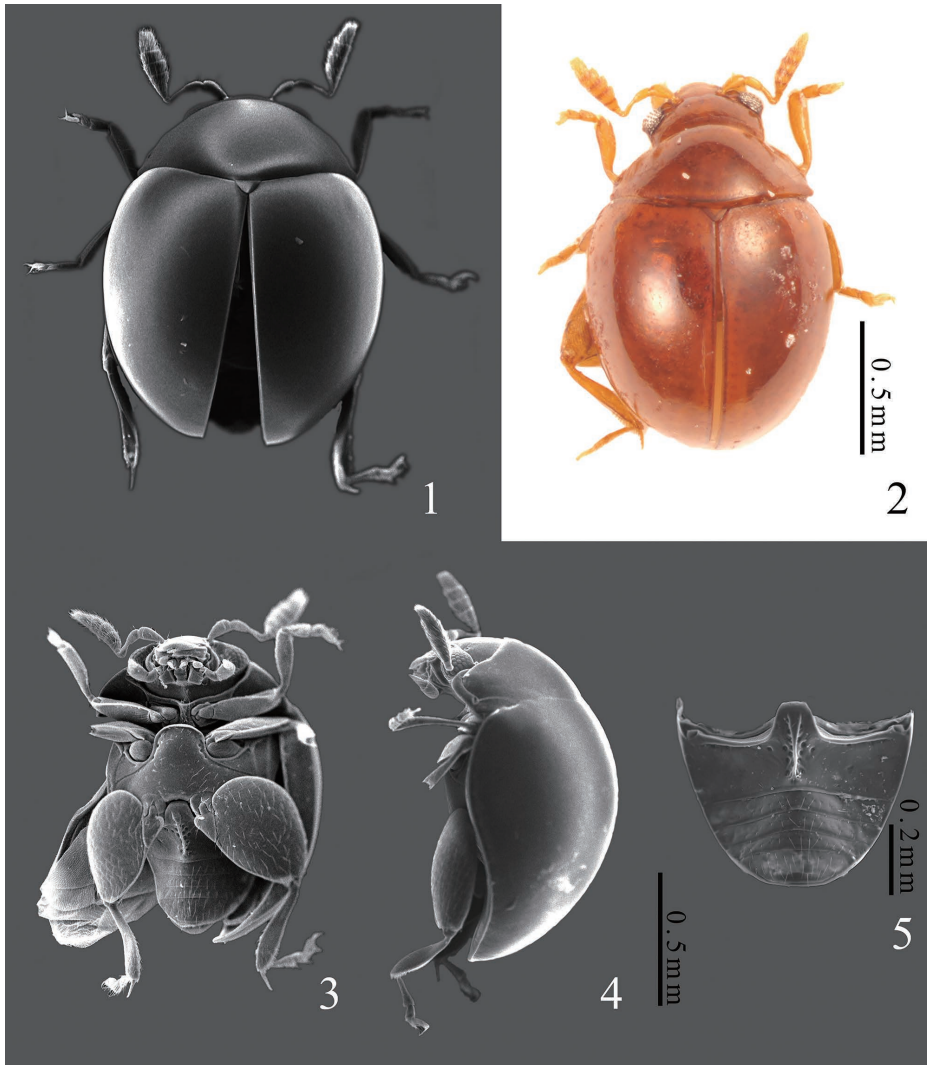
The genus *Clavicornaltica* was established by SCHERER (1974) with descriptions of five species from Sri Lanka. Since the original description of the genus, 17 species were described from Taiwan, China, Vietnam, India, Nepal, Indonesia, Malaysia and Australia (BASU & SEN GUPTA, 1981; DÖBERL, 2002, 2009; KONSTANTINOV, 1995; KONSTANTINOV & DUCKETT, 2005; LESAGE, 1997; MEDVEDEV, 1984, 1993, 1996, 2008, 2013; SCHERER, 1979). LESAGE (1997), and KONSTANTINOV and DUCKETT (2005) provided the redescription of the genus with the structures of female and male genitalia including the flagellum and internal sac in detail. SUZUKI (1992) examined many specimens collected from Mt. Kinabalu, East Malaysia and suggested that they included many new species. He also confirmed undetermined species of the genus distributed in Ishigaki-jima Is., Japan as the northernmost limit for the genus.

In the present paper, *Clavicornaltica mizusawai* n. sp. is described from Taiwan, and *C. sakishimana* n. sp. is described from Ishigaki-jima Is., Japan and Taiwan. We also provide an additional description of a Taiwanese species, *C. takimotoi* LESAGE, 1997.

Before going further, we are very grateful to Dr. Haruo TAKIZAWA, Dr. Kunio SUZUKI, Dr. Hiroyuki YOSHITOMI, Dr. Toshiya HIROWATARI, Dr. Chi-Feng LEE and Dr. Ming-Luen JENG for their continuous guidance. We also wish to express our cordial thanks to Dr. Yûsuke MINOSHIMA for permission to examine the specimens preserved in Kitakyushu Museum of Natural History, Fukuoka and the members of the Entomological Laboratory of Kyushu University, Fukuoka for their valuable advice and permission to use SEM. This study was contributed from the Entomological Laboratory, Kyushu University, Fukuoka (Ser. 7, No. 37).

Materials and Methods

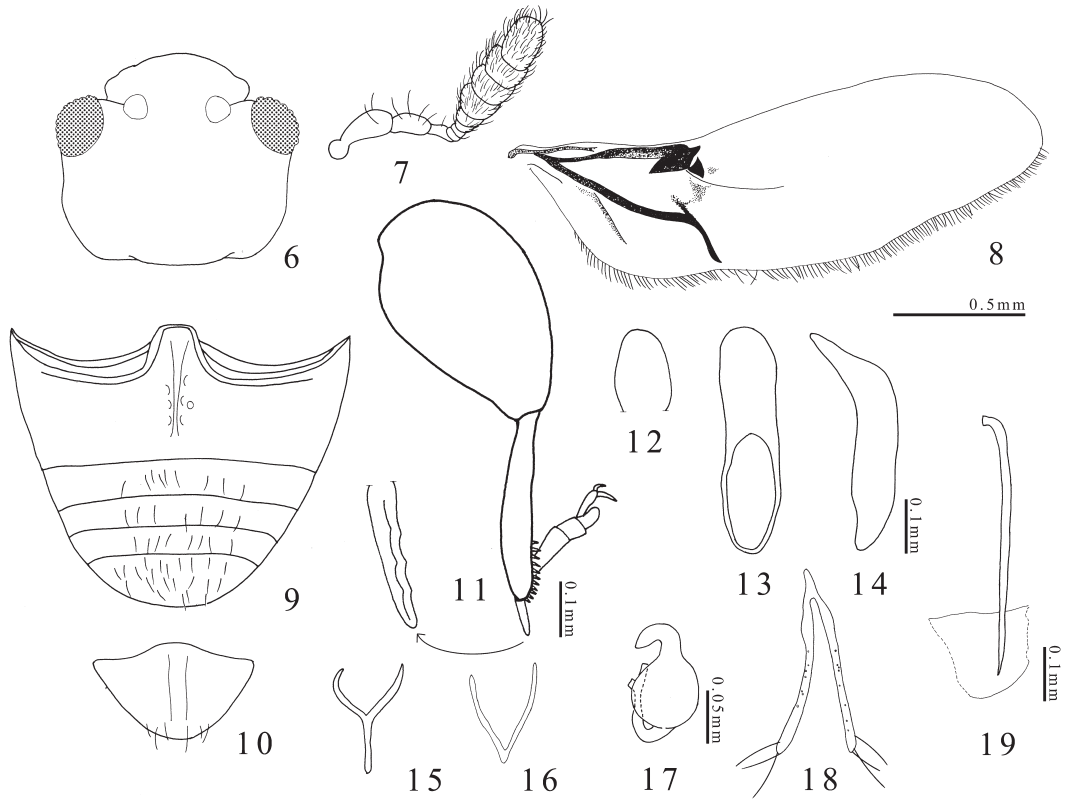
Materials. The specimens examined in this paper are preserved in Systematic Entomology, Hokkaido University (SEHU), Entomological Laboratory, Kyushu University, Fukuoka (ELKU), Kitaky-



Figs. 1–5. *Clavicornaltica mizusawai* n. sp. — 1, Dorsal view of body, male; 2, ditto; 3, ventral view of body, male; 4, lateral view of body, male; 5, abdominal sternites of male.

ushu Museum of Natural History, Fukuoka (KMNH), Taiwan Agricultural Research Institute, Taichung, Taiwan (TARI), Haruo TAKIZAWA private collection (HTC), and Haruki SUENAGA private collection (HSC).

Methods. This study is mainly based on the dried specimens. Aedeagi were mounted directly on a piece of cardboard, or fixed on slide preparations. The slides were examined under a stereomicroscope (Nikon SMZ 745), and figures were drawn using a biological microscope (Olympus BH2) with the drawing device.



Figs. 6–19. *Clavicornaltica mizusawai* n. sp. — 6, Head (HS-15-2); 7, antenna (HS-15-2); 8, right wing (HS-15-4); 9, abdominal sternites of male (HS-15-2); 10, pygidium of male (HS-15-4); 11, left hind leg (HS-15-4); 12, anterior margin of aedeagus (dorsal) (HS-15-2); 13, ventral view of aedeagus (HS-15-2); 14, lateral view of aedeagus (HS-15-2); 15, tegmen (HS-15-2); 16, spicule (HS-15-4); 17, spermatheca (HS-15-7); 18, stylus (HS-15-7); 19, spiculum (HS-15-7). Alphanumeric codes mean the depository of specimens.

***Clavicornaltica mizusawai* n. sp.**

[Japanese name: Taiwan-higebuto-komaru-tobi-hamushi]

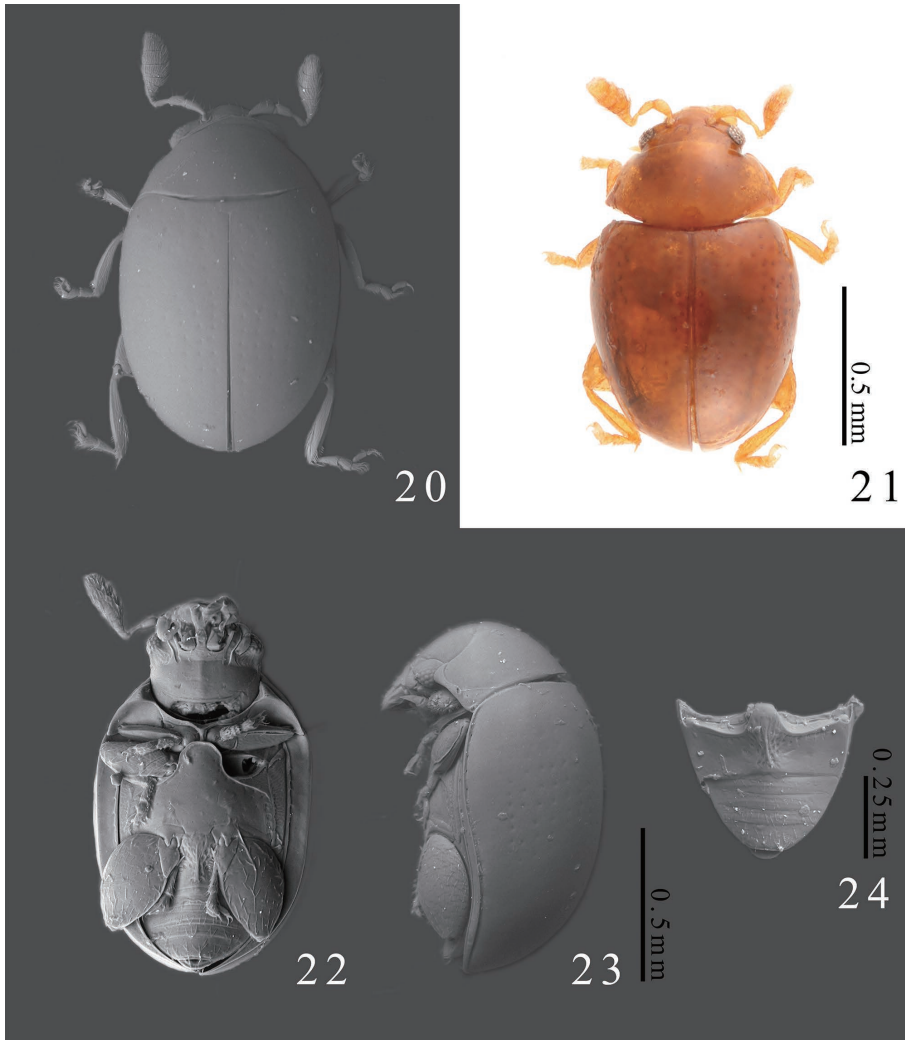
(Figs. 1–19)

Diagnosis. Body pale brown, larger, 1.11–1.37 mm, and sub-spherical. Head pale brown. Ratio of eye to inter-ocular space in dorsal view about 1 : 3. Antennae yellowish brown; clava long and slender. Hind wings well developed in male, reduced in female. Legs yellowish brown. Middle of second abdominal sternite with seven to sixteen strong and coarse punctures. Aedeagus long and rather slender; lateral sides subparallel.

Description. Body. 1.11–1.37 mm in length from anterior margin of pronotum to apices of elytra, 0.82–1.08 mm in maximum width (n = 22). Body sub-spherical and convex (Figs. 1–4).

Coloration. Body pale brown. Antennae and legs yellowish brown (Fig. 2).

Head. Head rectangular, very shallowly and sparsely punctate; vertex smooth; frontal tubercles

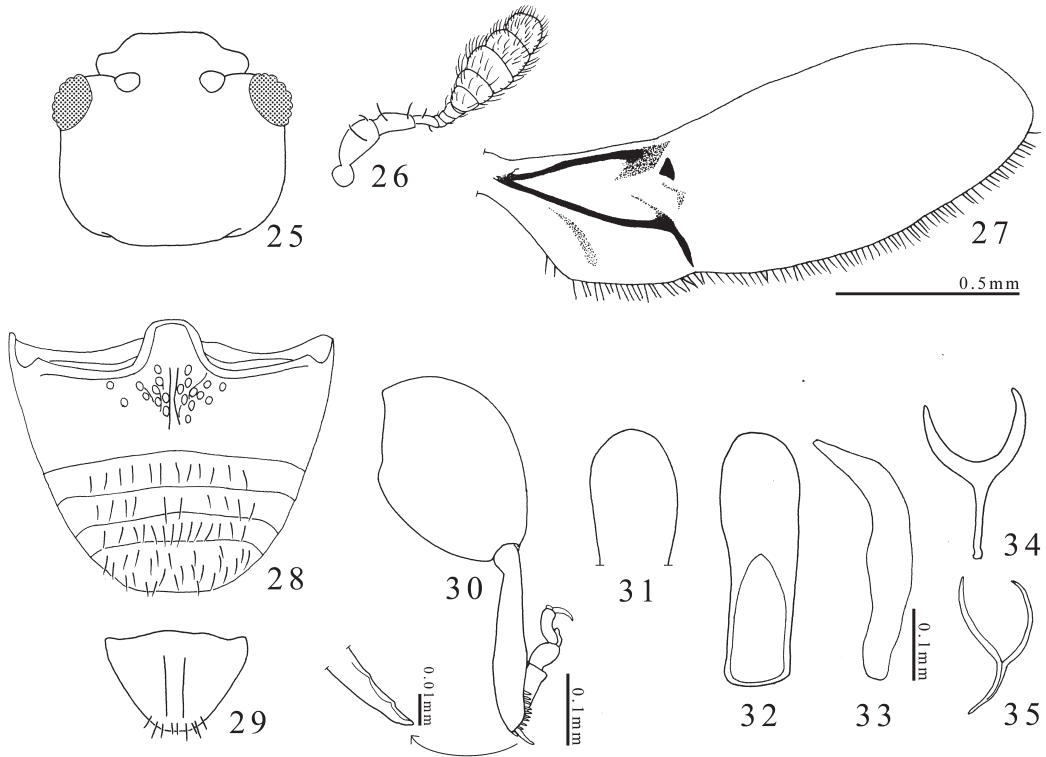


Figs. 20–24. *Clavicornaltica sakishimana* n. sp. — 20, Dorsal view of body, male; 21, ditto; 22, ventral view of body, male; 23, lateral view of body, male; 24, abdominal sternites of male.

and frontal carina absent (Fig. 6). Ratio of eye to inter-ocular space in dorsal view about 1 : 3 (Fig. 6). Antennae: clava long and slender (Fig. 7).

Thorax. Pronotum trapezoidal, strongly convex, very shallowly and sparsely punctate. Scutellum subtriangular. Elytra strongly convex (Fig. 4), very shallowly and sparsely punctate, punctures arranged in longitudinal rows. Hind wings well developed in male (Fig. 8), but reduced in female. Mesofemora broad in middle. Metafemora oblong-oval (Fig. 11). Apical spine of metatibia long with six teeth (Fig. 11).

Abdomen. Middle of second abdominal sternite with sharply raised carina and seven to sixteen coarse and strong punctures (Figs. 5, 9). Pygidium of male subtriangular with a pair of ridges in middle; posterior margin with six setae (Fig. 10).



Figs. 25–35. *Clavicornaltica sakishimana* n. sp. — 25, Head (HS-15-1); 26, antenna (HS-15-1); 27, right wing (HS-15-1); 28, abdominal sternites of male (HS-15-1); 29, pygidium of male (HS-15-1); 30, left hind leg (HS-15-8); 31, anterior margin of aedeagus (dorsal) (HS-15-1); 32, ventral view of aedeagus (HS-15-1); 33, lateral view of aedeagus (HS-15-1); 34, tegmen (HS-15-8); 35, spicule (HS-15-8). Alphanumeric codes mean the depository of specimens.

M a l e. Aedeagus long and rather slender, strongly curved ventrally in lateral view (Figs. 13, 14); anterior margin rounded (Fig. 12); lateral margins subparallel (Fig. 13). Spicule V-shaped, slender (Fig. 16). Tegmen Y-shaped, slender (Fig. 15).

F e m a l e. Spermatheca: receptacle very wide and oval; pump short and narrow, strongly curved; duct long and slender, strongly curved at base (Fig. 17). Stylus deeply V-shaped, slender with about fifteen pores on middle (Fig. 18) and three setae on apex. Spiculum: sclerotized part spine-shaped, long and slender (Fig. 19).

Type materials. Holotype: Male (SEHU), “Shuang-lien-bei, Yuanshan Hsiang, Ilan Hsien, TAIWAN, 20–25.X.2005, F. I. T. Trap, T. Mizusawa & T. Mita leg.”. Paratypes: 27 exs. (HTC, HSC), same data as the holotype; 2 males and 1 female (ELKU, HSC, HTC: HS-15-2), “TAIWAN: NANTOU, Puli, Nanshansi, 3–4.VII.2014, Takahiro Yoshida leg.”; 1 male and 2 exs. (TARI, HSC: HS-15-4), “Taiwan: Hualien, Tai 8 line 149.5~150K (6B-1), 4. XII. 2010, leg. W.-P. Chan”.

Distribution. Taiwan.

Etymology. The specific epithet of “*mizusawai*” is dedicated to Mr. Takashi MIZUSAWA who collected many specimens of this new species.

Remarks. This species is especially similar to *C. sakishimana* n. sp. and *C. takimotoi* LESAGE, 1997, but they are distinguished by features listed in Table 1.

***Clavicornaltica sakishimana* n. sp.**

[Japanese name: Sakishima-higebuto-komaru-tobi-hamushi]

(Figs. 20–35)

Diagnosis. Body pale brown, small, 0.89–1.06 mm, and oval. Head pale brown. Ratio of eye to inter-ocular space about 1 : 3. Antennae yellowish brown; clava short and robust. Hind wings well developed in male. Legs yellowish brown. Middle of second abdominal sternite with about 20 coarse and strong punctures. Aedeagus robust; lateral margins slightly narrowed toward base.

Description. Body. 0.89–1.06 mm in length from anterior margin of pronotum to apices of elytra, 0.53–0.76 mm in maximum width (n = 26). Body oval and convex (Figs. 20–23).

Coloration. Body pale brown. Antennae and legs yellowish brown (Fig. 21).

Head. Head rectangular, very shallowly and sparsely punctate; vertex smooth; frontal tubercles and frontal carina absent (Fig. 25). Ratio of eye to inter-ocular space in dorsal view about 1 : 3 (Fig. 25). Antennae: clava short but robust (Fig. 26).

Thorax. Pronotum trapezoidal, weakly convex, very shallowly and sparsely punctate. Scutellum subtriangular. Elytra weakly convex (Fig. 23), very shallowly and sparsely punctate, punctures arranged in longitudinal rows. Hind wings well developed in male (Fig. 27). Mesofemora broad in middle. Metafemora oval (Fig. 30). Apical spine of metatibia long with four teeth (Fig. 30).

Abdomen. Middle of second abdominal sternite with sharply raised carina and about 20 coarse and strong punctures (Figs. 24, 28). Pygidium of male subtriangular with a pair of ridges in middle; posterior margin with eight to nine setae (Fig. 29).

M a l e. Aedeagus robust, strongly curved ventrally in lateral view at apex (Fig. 33); apical margin rounded (Fig. 31); lateral margins slightly narrowed toward base (Fig. 32). Spicule Y-shaped, slender (Fig. 35). Tegmen Y-shaped, robust (Fig. 34).

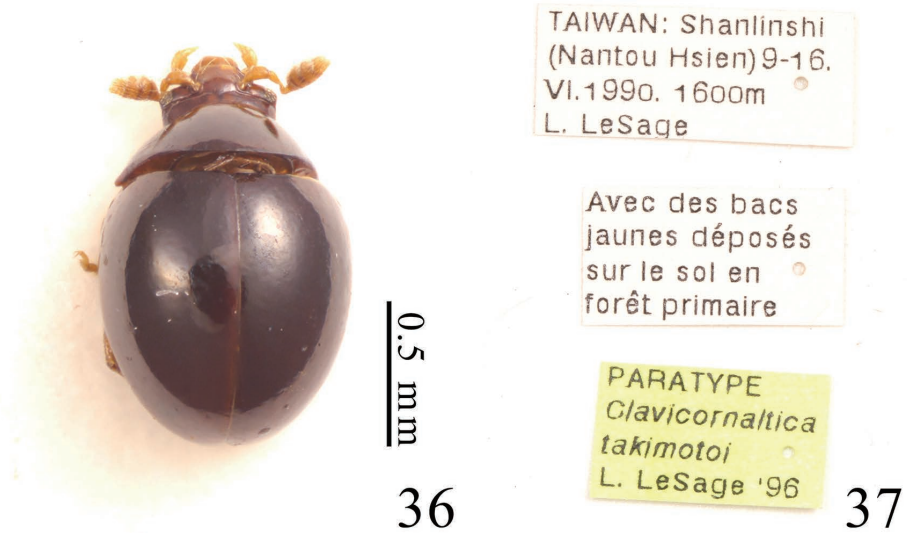
F e m a l e. Unknown.

Type materials. Holotype: male (SEHU), “*JAPAN: OKINAWA*, Ishigaki-shi, Mt. Yarabu-dake (FIT), 18~20-X-2014, Haruki Suenaga leg.”. Paratypes: Japan – 9 males (HSC: HS-15-1, HS-15-3, HS-15-5), same data as the holotype; 1 male (HSC), “*JAPAN: OKINAWA*, Ishigaki-shi, Yonebara, 17-III-2008, Haruki Suenaga leg.”; 15 males (ELKU, HSC), “*JAPAN: OKINAWA*, Ishigaki-shi, Mt. Yarabu-dake (FIT), 7~8-IV-2011, Takahiro Yoshida leg.”; 3 males (HSC: HS-15-6), “*JAPAN: OKINAWA*, Ishigaki-shi, Mt. Yarabu-dake (FIT), 8~14-IV-2011, Takahiro Yoshida leg.”; 4 males (HSC: HS-15-8), “*JAPAN: OKINAWA*, Ishigaki-shi, Mt. Yarabu-dake (FIT), 13~14-IV-2011, Takahiro Yoshida leg.”. Taiwan – 1 male (HSC), “Taiwan: Hualien, Tai 8 line 144.5~145K (7C-1), 18. XII. 2010, W. -P. Chan leg.”; 1 male (HSC), “Shuang-lien-bei, Yuanshan Hsiang, Ilan Hsien, TAIWAN, 20~25. X. 2005, F. I. T. Trap, T. Mizusawa & T. Mita leg.”.

Distribution. Japan (Ishigaki-jima Is.); Taiwan.

Etymology. The specific epithet of “*sakishimana*” is meaning Sakishima-shotô which is the group of islands including Ishigaki-jima Is., and these islands are located in southwestern Japan.

Remarks. Almost all of the specimens were collected with Flight Interception Trap (FIT). These specimens were males with well-developed hind wings, and no female was obtained. KONSTANTINOV and DUCKETT (2005) pointed out that *Clavicornaltica* species usually have well-developed hind wings in male, but no hind wings in female. There is a possibility that the female of *C. sakishimana*



Figs. 36–37. *Clavicornaltica takimotoi* LESAGE, 1997, paratype. — 36, Body; 37, labels.

n. sp. also lacks hind wings, therefore would not be collected with FIT.

***Clavicornaltica takimotoi* LESAGE, 1997**

[Japanese name: Takimoto-higebuto-komaru-tobi-hamushi]

(Figs. 36 & 37)

Clavicornaltica takimotoi LESAGE, 1997: 244.

Diagnosis. Body dark brown, rather large, 1.14–1.25 mm (LESAGE, 1997), and sub-spherical. Head dark brown. Ratio of eye to inter-ocular space about 1 : 7. Antennae yellowish brown; clava short and robust. Legs yellowish brown. Aedeagus robust; lateral slightly narrowed to base (LESAGE, 1997).

Additional descriptions. Body. Body oval and sub-spherical (Fig. 36).

Coloration. Body dark brown. Antennae and legs yellowish brown (Fig. 36).

Head. Head rectangular. Ratio of eye to inter-ocular space in dorsal view about 1 : 7. Antennae: clava short and robust (Fig. 36).

Thorax. Pronotum trapezoidal, strongly convex. Elytra strongly convex.

Type materials examined. Paratypes: 3 exs. (KMNH), “TAIWAN: Shanlinshi, (Nantou Hsien) 9-16.VI.1990. 1600m, L. LeSage” [white label, printed] / “Avec des bacs jaunes déposés sur le sol en forêt primaire” [white label, printed] / “PARATYPE, *Clavicornaltica takimotoi*, L. LeSage ‘96” [light yellow label, printed].

Table 1. The differential diagnosis of *Clavicornaltica mizusawai* n. sp., *C. sakishimana* n. sp. and *C. takimotoi* LESAGE, 1997.

	<i>C. mizusawai</i> n. sp.	<i>C. sakishimana</i> n. sp.	<i>C. takimotoi</i> LESAGE
Body	Larger, 1.11–1.37 mm.	Smaller, 0.89–1.06 mm.	Larger, 1.14–1.25 mm (after LESAGE, 1997).
Antennae	Clava slender and longer.	Clava robust and shorter.	Clava robust and shorter.
Eyes	Larger, ratio of eye to inner-ocular space of head in dorsal view about 1:3.	Larger, ratio of eye to inner-ocular space of head in dorsal view about 1:3.	Smaller, ratio of eye to inner-ocular space of head in dorsal view about 1:7.
Legs	Apical spine of tibia with six teeth.	Apical spine of tibia with four teeth.	Apical spine of tibia with about four to six teeth. (after LESAGE, 1997).
Abdominal sternites	Second abdominal sternite with about seven to sixteen coarse and strong punctures.	Second abdominal sternite with about 20 punctures.	
Aedeagus	Aedeagus long and slender; lateral sides subparallel.	Aedeagus robust; lateral sides slightly narrowed to base.	Aedeagus robust; lateral sides slightly narrowed to base.
Spermatheca	Receptacle very wide and ovoid; duct long and slender, strongly curved at base.		Receptacle slender and narrowed to apex; duct short. (after LESAGE, 1997).

要 約

末長晴輝・吉田貴大：石垣島と台湾におけるヒゲブトコマルトビハムシ属（ハムシ科ヒゲナガハムシ亜科）の2新種。——ヒゲブトコマルトビハムシ属 *Clavicornaltica* は体長が0.8 mm～2.2 mm と小さく、触角に球稈部をもち、土壌性であることからハムシ科のなかでもきわめて特徴的な属である。SCHERER (1974) によって属が設立されて以来、中国や台湾、東南アジア、オーストラリアから22種が記載されてきた。このたび、石垣島と台湾から2新種を認め、タイワンヒゲブトコマルトビハムシ *C. mizusawai* n. sp. およびサキシマヒゲブトコマルトビトビハムシ *C. sakishimana* n. sp. のように命名した。これらの種は同じく台湾から記載されたタキモトヒゲブトコマルトビハムシ *C. takimotoi* LESAGE, 1997 にきわめてよく似るが、体長や体色、複眼のサイズ、触角球稈部の形などによって区別できる。サキシマヒゲブトコマルトビハムシは、検した標本のほとんどがフライトインターセプショントラップ (FIT) により採集されたもので、全個体が発達した翅を持つ雌であった。雌が得られなかった原因として、雌の翅が退化しており FIT に入りにくかった可能性が考えられる。

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