



## Taxonomic Studies on the Genus *Altica* Geoffroy (Coleoptera, Chrysomelidae, Galerucinae, Alticini) in Taiwan: Re-evaluation of *A. himalayensis* (Chen), *A. cyanea* (Weber), and *A. caerulea* (Olivier)

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### ABSTRACT

*Altica chingfui* **sp. nov.** is described from Taiwan based on specimens misidentified as *A. himalayensis* Chen, with notes on its biology. Scanning electron microscope images of the male genitalia and illustration of female genitalia are provided. Records of *Altica cyanea* (Weber) and *A. caerulea* (Olivier) are based on misidentifications and are removed from the Taiwanese fauna.

**Key words:** Taxonomy, zoogeography, biology, leaf beetle, flea beetle

### Introduction

The flea-beetle genus *Altica* Geoffroy, 1762 contains approximately 250 valid species from all major biogeographic regions except Antarctica (Furth, 1980; Suenaga, 2020). Previously reported species from Taiwan (as Formosa) include *Haltica cyanea* Weber, 1801 (Weise, 1922), and *H. brevicosta* Weise, 1922 (Chen, 1934). Chûjô (1936) recorded *H. caerulescens* (Baly, 1874) from Formosa and included keys to Taiwanese *Altica* species known to that time. Kimoto (1966) added new records for *A. caerulea* [sic!] (Olivier, 1791) from Taiwan based on an examination of Sauter's collection preserved in the Zoological Museum, Berlin.

Kimoto (1971) subsequently added *A. deserticola* (Weise, 1889), *A. himensis* (Shukla, 1960), and *A. birmensis* [sic!] (Jacoby, 1896) from Taiwan, and synonymized *A. brevicosta* with *A. caerulea* [sic!]. Takizawa (1978) described larvae of *A. birmensis* [sic!] and *A. cyanea* from Taiwan. Takizawa (1979) added *A. himalayensis japonica* Ohno, 1960 to the Taiwanese fauna. Kimoto and Chu (1996) listed seven species of *Altica* from Taiwan. Kimoto (1997) comprehensively reviewed Taiwanese Chrysomelidae, redescribed the seven species, provided keys, and listed synonyms. Takizawa (1997) reviewed larvae of seven species, including *A. cirsicola* Ohno, 1960, from Taiwan and provided larval identification keys. Lee and Cheng (2007) illustrated the

adults and larvae of *A. birmanensis* and *A. cyanea* with color photographs, and described their biology in Taiwan. Döberl (2010) listed six species: *A. birmanensis*, *A. caerulea*, *A. caerulescens*, *A. cirsicola*, *A. himalayensis*, and *A. japonica*. *Altica cyanea* and *A. deserticola* are omitted. Reid and Beatson (2015) revised Oriental and Australian *Altica* and resurrected *A. aenea* from synonymy with *A. cyanea*. They also pointed out that almost all records of *A. cyanea* are misidentifications of specimens of *A. aenea*. These authors also recorded *A. birmanensis* from Taiwan, and stated that many records of *A. cyanea* and *A. caerulea* result from confusion with this species. Suenaga (2020) recorded *A. aenea* and *A. birmanensis* from Taiwan based on the taxonomic actions of Reid and Beatson (2015). A total of seven species of *Altica* have been recorded from Taiwan up to the current study, including described and illustrated larvae of *A. aenea* and *A. birmanensis*.

*Haltica himalayensis* was described from the Himalayas by Chen (1936). Kimoto (1971) first recorded this species from Taiwan as *A. himensis* (Shukla, 1960). Kimoto and Takizawa (1973) synonymized *A. himensis* with *A. himalayensis*, and the following studies accepted this interpretation. Kimoto and Chu (1996) and Kimoto (1997) listed it in the Taiwanese fauna as *A. himalayensis*. Scherer (1969) recorded *A. himensis* from India and Nepal and pointed out variations in aedeagal structures. Reid and Beatson (2015) and Mahendiran *et al.* (2019) also noted that *A. himalayensis* from Indo-Malaya had been confused with several species. Thus, *A. himalayensis* is one of the most confusing *Altica* species.

In this study, Taiwanese populations that were identified as *A. himalayensis* and the holotype of *A. himalayensis* were examined, and specimens from Taiwan are described as a new species, *A. chingfui* sp. nov., based on differences in morphological characters. Scanning electron microscope images of the male genitalia and illustrations of female genitalia are provided. The biology of this species is described with images of their hosts and each of the biological stages. *Altica cyanea* is removed from Taiwanese fauna as a misidentification of *A. aenea*, and *A. caerulea* is also removed from Taiwanese fauna as a misidentification of *A. birmanensis* based on

the species concepts of Reid and Beatson (2015) and Suenaga (2020).

## Material and Methods

This study was based on dried specimens. Examined specimens were collected from host plant leaves by hand, or sweeping using a collecting net. For examining male and female genitalia, specimens were relaxed in boiling water for 15 minutes before removing the abdomens from the forebodies. For examining male and female genitalia, specimens were softened in boiling water for 15 min, and the abdomen was removed. Genitalia was dissected from the abdomen and softened in KOH solution (ca. 10%) at 60°C for 15 min to remove the surrounding muscles. Female genitalia was dehydrated in 99% ethanol and mounted on microscopic slides with Euparal resin. Male genitalia were mounted directly on the cardboard. External structures were observed using a stereo microscope (Nikon SMZ745). The female genitalia were observed using a compound microscope (Olympus BH2) and drawn with a drawing device. Habitus photos were taken using a stereo microscope with a CCD camera (Nikon DS-Fi1, DS-L3) or a digital single-lens reflex camera (Panasonic Lumix G6) with a bellows and a lens (Nikon EL-NIKKOR 1:4 f = 50 mm lens). Photographs were stacked using Combine ZP stacking software. SEM images were taken with a JSM-6510 scanning electron microscope (JEOL Ltd.) and an S-3400N scanning electron microscope (Hitachi High-Tech Corporation). All images were edited using Adobe Photoshop CS6 and Illustrator CS6.

All measurements in the text are given in millimeters. Means and standard deviations (range = mean ± standard deviation) are provided. The following abbreviations are used for measurements. AL: length of antennae, BL: length of body (from anterior margin of frons to elytral apices), ELL: length of elytron, ELW: width of elytron, EW: lateral width of eye, HL: length of head, HTL: length of hind tibiae, HW: width of head (including eyes), PL: length of pronotum (along the mid-line), APW: width of anterior margin of pronotum, PPW: width of posterior margin of pronotum.

Morphological terminology including female



Fig. 1. Holotype of *Haltica himalayensis* Chen, 1936. (A) dorsal view; (B) lateral view; (C) labels.

genitalia used in this study follows Konstantinov and Lingafelter (2002). The terminology of mouth parts and part of male genitalia used in this study follows LeSage (1995) and Suenaga (2020).

Specimens used in this study are deposited in the following collections (in alphabetical order): Ehime University Museum, Ehime, Japan (EUMJ; K. Konishi and H. Yoshitomi); the private collection of Haruki Suenaga (HSPC); Kitakyushu Museum of Natural History, Fukuoka, Japan (KMNH; Y. Minoshima); Systematic Entomology, Hokkaido University, Sapporo, Hokkaido, Japan (SEHU; M. Ohara); Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (SDEI: M. Schröter); Taiwan Agricultural Research Institute, Taichung, Taiwan (TARI: C.-F. Lee).

Some identified specimens were marked with specimen number: HS (initials of Haruki Suenaga)- the last two digits of a year-number of specimen. These numbers reference abbreviations of institutions or private collections where type specimens and additional specimens are deposited.

For re-evaluating the taxonomic status of Taiwanese populations of *A. himalayensis*, the holotype (sex undetermined, based on photos, SDEI) (Fig. 1A-C) was studied: “Himalayen” (handwritten on white card), “Coll. Kraatz” (printed on white card), “Holotypus” (printed on red card), “*Haltica / himalayensis / S. H. CHEN det.*” (handwritten and typed on white card), “SDEI Coleoptera / # 303683” (typed on white card).

This taxonomic paper is registered in the ZooBank as a requirement for the established Official Register of Zoological Nomenclature (urn:lsid:zoobank.org:pub:0B904179-D6D2-4300-A50F-23482D1CE5E1).

### Taxonomy

Genus *Altica* Geoffroy

*Altica* Geoffroy, 1762: 244 [original description];  
 Geoffroy 1764: 244 [reprint edition];  
 Geoffroy 1799: 244 [new edition]; Latreille  
 1810: 235, 432 [type species designated].  
 Type species: *Chrysomela oleracea* Linnaeus,  
 1758, subsequent designation by Latreille  
 (1810). These attributions and authorships

were conserved under the plenary powers and placed on the Official List of Generic Names in Zoology by ICZN (1994) [Opinion 1754].

*Haltica* Illiger, 1801: 127, 138; Illiger 1807: 59. Unjustified emendation of *Altica*: ICZN (1994).

*Altica* Müller, 1764: XIV. Wrong attributions of authorship, and erroneously cited by many authors (see synonym list of LeSage (1995)).

*Altica* Fabricius, 1775: 112. Wrong attributions of authorship, and erroneously cited by many authors (see synonym list of LeSage (1995)).

*Graptodera* Chevrolat, 1836: 388; Chevrolat 1845: 307 [type species designated]; Weise 1888: 825 [synonymy]. Type species: *Chrysomela oleracea* Linnaeus, 1758, subsequent designation by Chevrolat (1845).

*Rybakowia* Jacobson, 1892: 465 [original description]; Heikertinger 1924: 39 [synonymy]. Type species: *Rybakowia pyriformis* Jacobson, 1892 by monotypy.

*Halticoidea* Germain, 1903: 57 [original description].

Type species: *Halticoidea costifera* Germain, 1903.

*Halticella* Germain, 1903: 60 [original description].

Type species: *Halticella atrocyanea* Germain, 1903.

Additional synonymies are available in LeSage (1995) and Suenaga (2020).

### *Altica chingfui* sp. nov.

(Figs 2A-F, 3A-F, 4A-D, 5A-D)

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*Altica himensis* sensu Kimoto 1971: 80 [distribution record: Taiwan].

*Altica himalayensis* sensu Kimoto and Chu 1996: 126 [list of Taiwanese species]; Kimoto 1997: 256, 412 [key].

**Type material.** Holotype: 1 ♂ (TARI: HS-12-283), “Taiwan: Ilan (11557) / Ssuyuan (思源) / 18.VI.2009, leg. M.-H. Tsou” (printed on white card in English and Chinese), “*Altica* sp. Det. H. Suenaga, 2012 / HS-12-383” (printed on white card), “Holotype / *Altica chingfui* / Suenaga and Lee, 2023 / Appended label by / H. Suenaga, 2023” (typed on red card). Paratypes: TAIWAN.

CHIAYI: 1 ♂ (HTPC), Mt. Alishan, 9-10-VII-1981, H. Takizawa; 1 ♂ (HSPC: HS-20-110; #27308), Lulinshan (鹿林山), 8-V-2015, J.-C. Chen. HUALIEN: 1 ♂, 2 ♀ (HTPC), Pilu (碧綠), 10-VII-1983, H. Takizawa; 2 ♂, 2 ♀ (TARI, HSPC: HS-20-111, 112, 118, 119; #29724 - #29727), same locality, 25-V-2018, H.-F. Lu; 1 ♂, 1 ♀ (TARI: HS-20-113, 122; #29809, #29810), same data but with “17-VI-2018”. ILAN: 1 ♂, 5 ♀ (TARI: HS-12-384 - 386, HS-20-121, 123, 127; 11554 - 11556), same data as the holotype; 13 ♂, 6 ♀, 1 ex. (TARI: HS-20-101 - 109, 115 - 117, 124, 126, 128; 19586 - 19605), Ssuyuan (思源), 2-VI-2011, M.-H. Tsou. KAOSHIUNG: 1 ♀ (TARI: HS-20-114), Tienchih (天池), 1-IV-2015, C.-F. Lee.; 1 ♂ (TARI: HS-20-100), same locality, 21-IV-2016, C.-F. Lee. NANTOU: 1 ♀ (TARI: HS-20-120; #29890), Hehuanshan (合歡山), 23-VI-2018, H.-F. Lu. TAICHUNG: 1 ♂ (EUMJ), Saliujiu Hut (三六九山莊), Hsueshantungfeng, 30-VI-1989, M. Sato. TAITUNG: 1 ♀ (TARI: HS-20-125; #25766), Hsiangyangshan (向陽山), 20-VI-2014, J.-C. Chen.

**Description.** Body. Male lengths 3.25-4.1 mm (Fig. 2A-C), females 3.85-4.55 mm (Fig. 2D-F); male widths 2.00-2.44 mm, females 2.16-2.68 mm; convex (Fig. 2C, F), ovoid in shape.

Coloration. Pronotum metallic blue or purple with metallic luster (Fig. 2A, D); each elytron blue or purple with metallic luster, sometimes colors dappled; antennae and legs black with metallic blue luster (Fig. 2B, E).

Head. Vertex smooth (Fig. 3A, B); each frontal tubercle rectangular. Frontal carina long and thick. Antennae somewhat robust (Fig. 5A); third antennomere slightly longer than second; fourth antennomere distinctly longer than third. Ratio of antennae to body: 2 : 1 in males, 4 : 3 in females. Ratio of length of each antennomere (2nd to last antennomere): 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 3 in males, 2 : 2 : 2 : 3 : 2 : 3 : 2 : 2 : 2 : 3 in females.

Thorax. Pronotum subparallel or slightly narrowed to base, obliquely rounded to apex (Fig. 3A); surface somewhat strongly convex, finely, sparsely punctate; subbasal transverse impression deep, distinctly sinuate in middle; interspace smooth. Scutellum tongue-shaped, rounded at apex, smooth. Elytra oblong, finely, sparsely punctate, the punctures stronger than

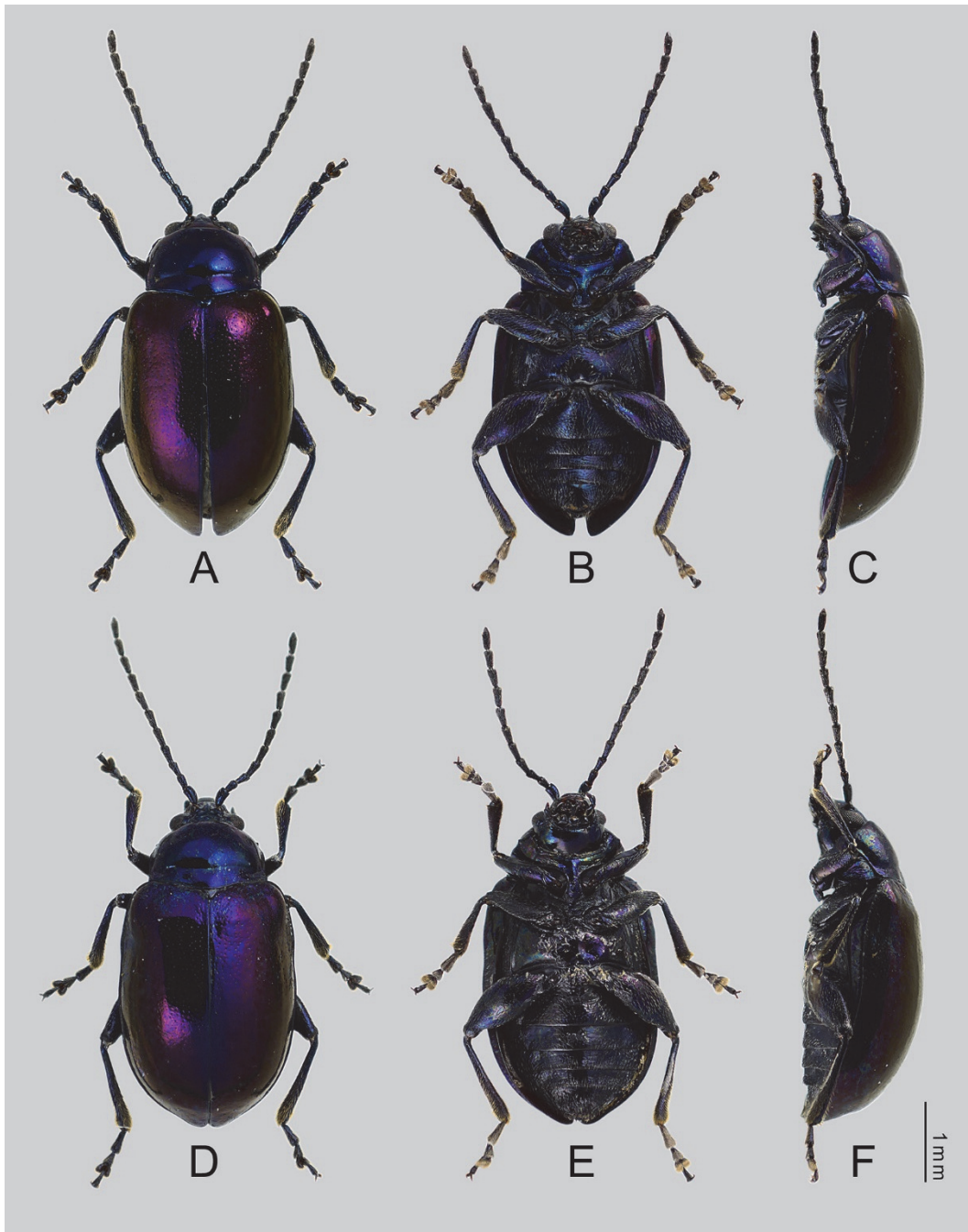


Fig. 2. *Altica chingfui* sp. nov., habitus. (A) male (HS-20-110), dorsal view; (B) ditto, ventral view; (C) ditto, lateral view; (D) female (HS-20-115), dorsal view; (E) ditto, ventral view; (F) ditto, lateral view.

those of pronotum (Fig. 3C); interspaces smooth.

**Abdomen.** Abdominal ventrites sparsely pubescent (Fig. 3D). Pygidium pubescent in middle (Fig. 3E), and lateral and anterior margins. Eighth abdominal tergite pubescent anteriorly (Fig. 3F).

**Male.** First tarsomeres of fore and middle legs broader apically (Fig. 2A, B). Aedeagus short and robust, flat dorsally, convex ventrally (Fig. 4A-D); median lamella trapezoidal (Fig. 4A); lateral lamellae slender and elongate (Fig. 4A);

dorsal transverse undulations strong and broad (Fig. 4A); lateral edges obtuse (Fig. 4D); two short lateral ridges present near apex of ventral surface (Fig. 4C, D), weakly incurved; lateral fold thin from middle to near apex (Fig. 4B, C, D); apical tip nipple-shaped in dorsal and ventral view (Fig. 4A, C), simple in lateral view (Fig. 4B).

**Female.** First tarsomeres of fore and middle legs slightly broader apically (Fig. 2D, E). Vaginal palpi slender, weakly sinuate laterally, with nine apical setae (Fig. 5B); sclerotized areas

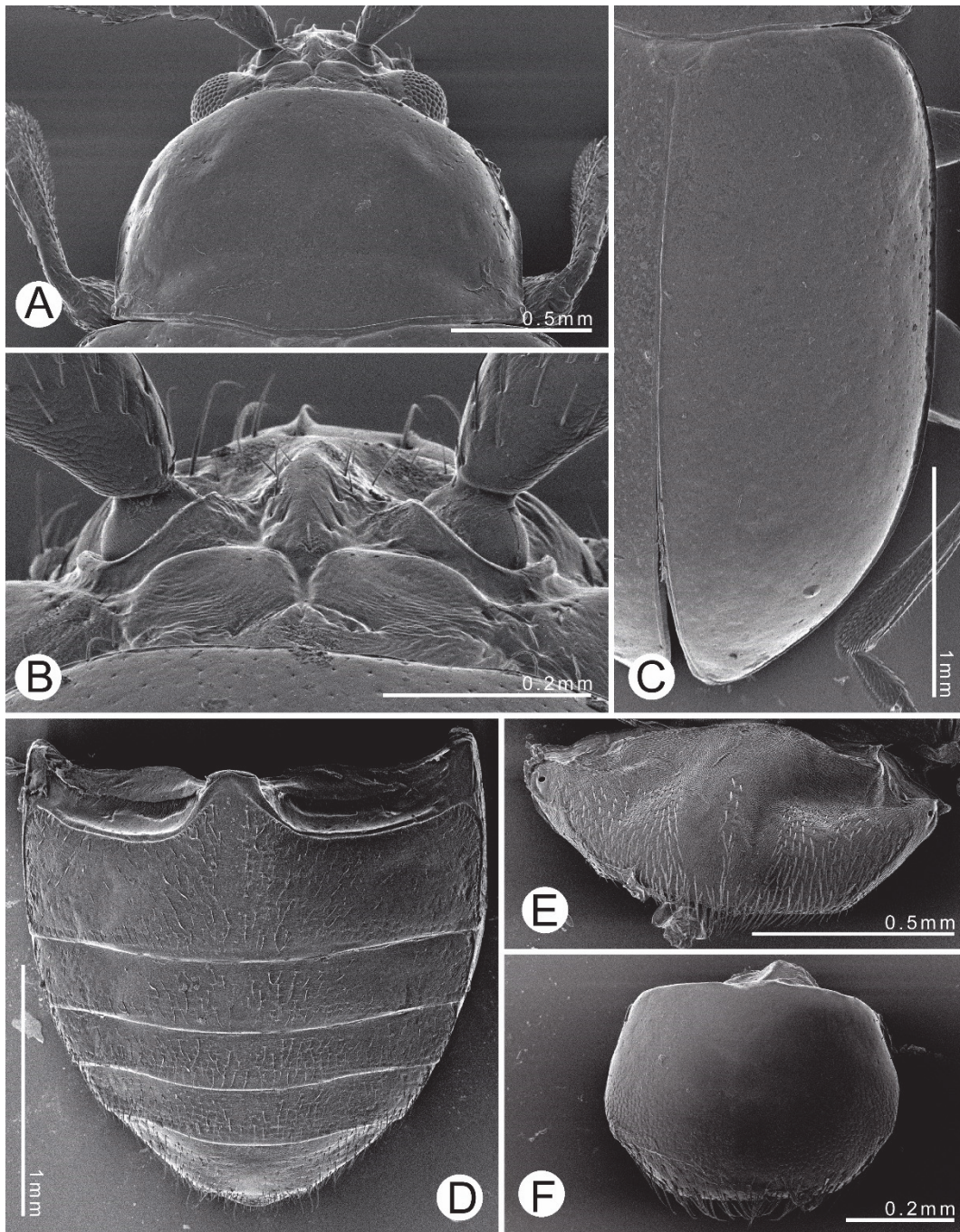


Fig. 3. *Altica chingfui* sp. nov. (holotype, HS-12-383) (A) head and pronotum; (B) vertex; C, elytra; (D) abdominal ventrite; (E) pygidium; (F) eighth abdominal tergite.

wide and straight, broader apically. Tignum (Fig. 5C): sclerotized area straight, diamond-shaped at base. Spermatheca (Fig. 5D): spermathecal gland valve large; spermathecal pump appendix absent; spermathecal duct robust, with a loop.

Measurements. Male (n= 16), BL: 3.25-4.10 (3.79±0.2); HL: 0.36-0.48 (0.41±0.04); HW: 0.80-0.94 (0.88±0.04); AL: 2.34-2.71 (2.52±0.1); EW: 0.16-0.22 (0.18±0.02); PL: 0.76-0.94 (0.84±0.06); APW: 0.88-1.06 (0.97±0.06); PPW: 1.24-1.54 (1.36±0.08); ELL: 2.50-3.20 (2.86±0.17); ELW:

1.00-1.22 (1.11±0.06); HTL: 1.04-1.26 (1.15±0.06). Female, BL (n= 16): 3.85-4.55 (4.22±0.21); HL (n= 16): 0.32-0.50 (0.41±0.05); HW (n= 16): 0.86-1.00 (0.95±0.05); AL (n= 15): 2.30-2.82 (2.63±0.14); EW (n= 16): 0.18-0.24 (0.20±0.02); PL (n= 16): 0.86-1.04 (0.96±0.05); APW (n= 16): 0.90-1.12 (1.05±0.06); PPW (n= 16): 1.38-1.60 (1.50±0.07); ELL (n= 16): 2.90-3.50 (3.18±0.17); ELW (n= 16): 1.08-1.34 (1.23±0.09); HTL (n= 16): 1.10-1.38 (1.24±0.08).

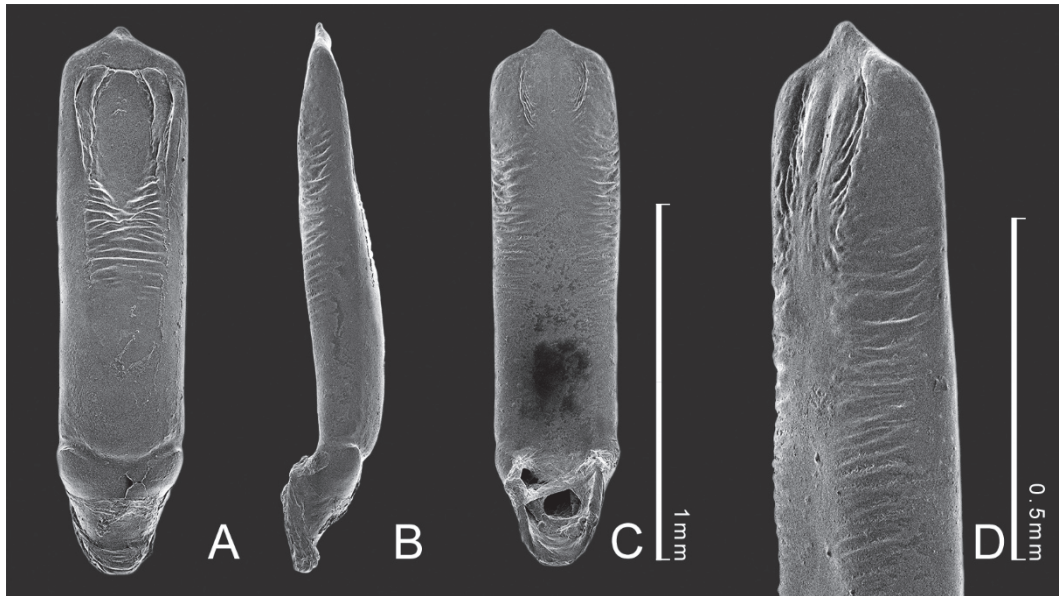


Fig. 4. *Altica chingfui* sp. nov. (holotype, HS-12-383), male, aedeagus. (A) dorsal view; (B) lateral view; (C) ventral view; (D) latero-ventral view.

**Differential diagnosis.** Adults of this new species are most similar to *A. circaeae* Ohno, 1960 and *A. himalayensis* Chen, 1936. They may be distinguished by the following features: body bicolored, pronotum blue and elytra purple (Fig. 2A, D) (*A. circaeae*: blue entirely. *A. himalayensis*: greenish blue (Fig. 1A, B)), elytra finely punctate (*H. himalayensis*: coarsely punctate); male genitalia (Fig. 4A-D): lateral apex of ventral side of aedeagus with a pair of incurved, short exterior ridges, and a pair of straight, short interior ridges (Fig. 4C, D); (*A. circaeae*: two pairs of apical ridges straight and short); lateral edges obtuse (Fig. 2B, D) (*A. circaeae*: distinct). Based on current data, this new species is endemic to Taiwan (*A. circaeae* distributed in east Palearctic: Far East of Russia, Korea and Japan (Suenaga, 2020). *A. himalayensis* distributed from Himalayan Mountains in Oriental region: China, Bhutan, Nepal, India, Pakistan and Oriental Region (Döberl, 2010).

**Host plants.** Onagraceae: *Epilobium amurense* Hausskn. (Fig. 6A). and *Oenothera glazioviana* Micheli.

**Biology.** *Altica chingfui* sp. nov. is an uncommon species in Taiwan, inhabiting forest edges and mountainous areas (above 2,000 m elevation). The species seems to be univoltine. Adults (Fig. 6F) appear from April to July. Females lay eggs singly (Fig. 6B) under host plant leaves during

late May. Duration of the larval stage (Fig. 6C, D) is about ten days, pre-pupal stage four days, and pupal stage (Fig. 6E) seven days.

**Distribution.** Taiwan.

**Etymology.** The specific epithet '*chingfui*' honors Mr. Ching-Fu Chen (陳敬富), who, together with Mr. Jung-Chan Chen (陳榮章), discovered and collected this species and provided specimens to Mr. Mei-Hua Tsou (曹美華).

**Remarks.** Specimens of this species were recorded previously as members of *A. himalayensis*, which also possess bicolored purple bodies and are distributed in high-altitude areas of Taiwan. However, this new species may be distinguished from *A. himalayensis* by the bicolored body, and finely punctate elytra.

*Altica aenea* (Olivier, 1808)  
(Figs 7A-D, 8A-D)

*Galeruca aenea* Olivier, 1808: 646 [original description; type locality Java].

*Altica aenea*: Gressitt and Kimoto 1963: 890 [as a synonym of *A. cyanea* sensu auct.]; Reid and Beatson 2015: 513 [faunistics, resurrection from synonymy of *A. cyanea*, neotype designation]; Suenaga 2020: 166

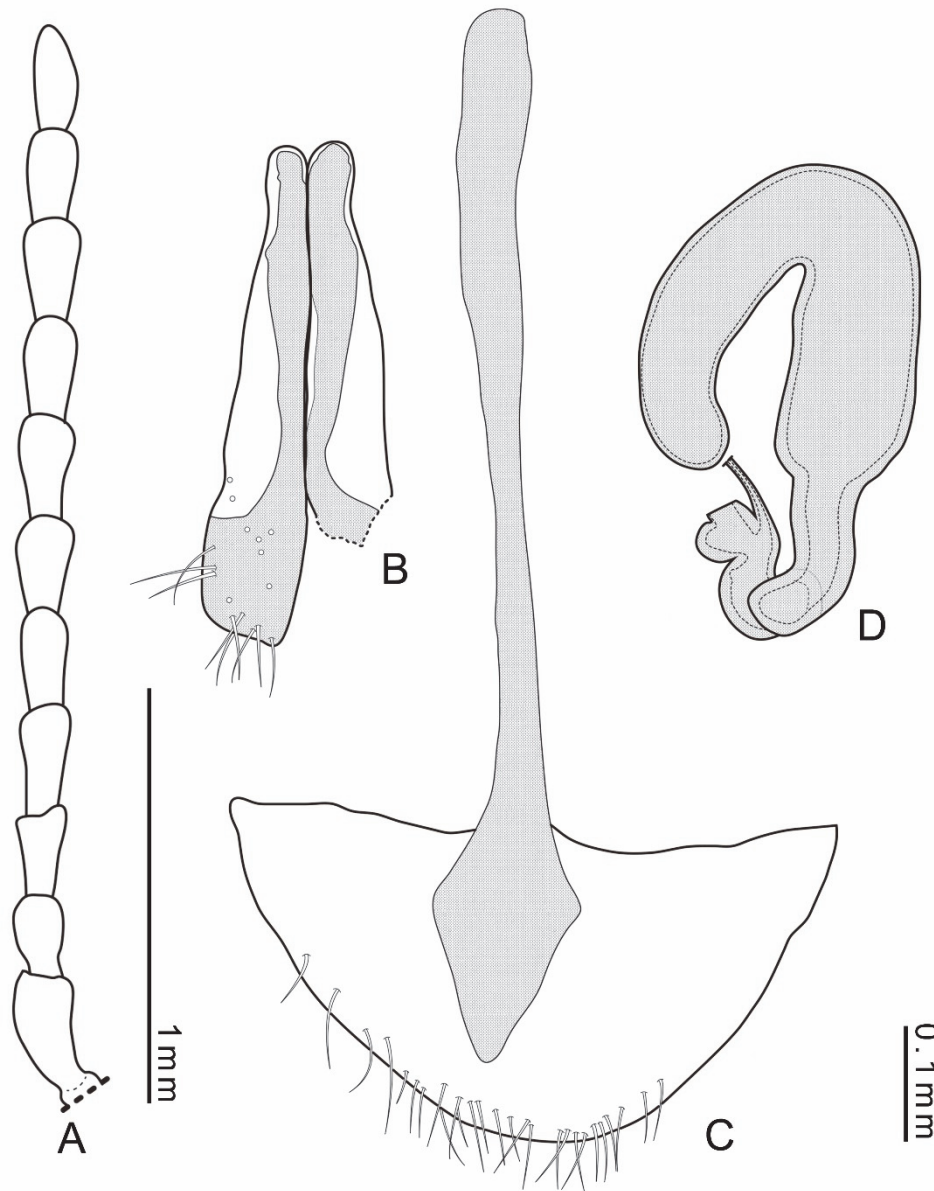


Fig. 5. *Altica chingfui* sp. nov., antenna, and female genitalia. (A) right antenna; (B) vaginal palpi; (C) tignum; (D) spermatheca.

[redescription, faunistics].

*Haltica aenea*: Heikertinger and Csiki 1939: 247 [as a synonym of *A. cyanea* sensu auctt.].

*Haltica australis* Blackburn, 1889: 1493 [original description; type locality Australia]; Blackburn 1896: 75; Weise 1923: 109 [as synonym of *A. cyanea* sensu auctt.]; Scherer 1982: 480 [resurrected from synonymy as *Altica australis*]; Reid and Beatson 2015: 513 [considered as synonym of *A. aenea*, lectotype designated].

*Haltica ignea* Blackburn, 1889: 1494 [original description; type locality Australia]; Reid and Beatson 2015: 513 [synonymy].

*Haltica bicolora* Jacoby, 1904: 482 [original

description; type locality New Guinea]; Reid and Beatson 2015: 513 [synonymy].

*Altica jussiaeae* Gressitt, 1955: 34 [original description; type locality Palau]; Reid and Beatson 2015: 513 [synonymy].

*Altica coerulea* sensu Weise 1923 nec Olivier, 1791; Weise 1923: 109.

*Haltica cyanea* sensu auct.: Weise, 1922: 109 [records: Japan, Formosa, Luzon, China, Singapore, Sumatra, Borneo, Java]; Chen 1933-1934: 51 [records: China, Japan, Formosa, Singapore, Borneo, Sumatra, Java]; Chen 1934: 176, 180 [records: Formosa, China, Japan, Indo-China, Burma, India, Java, Sumatra]; Heikertinger and



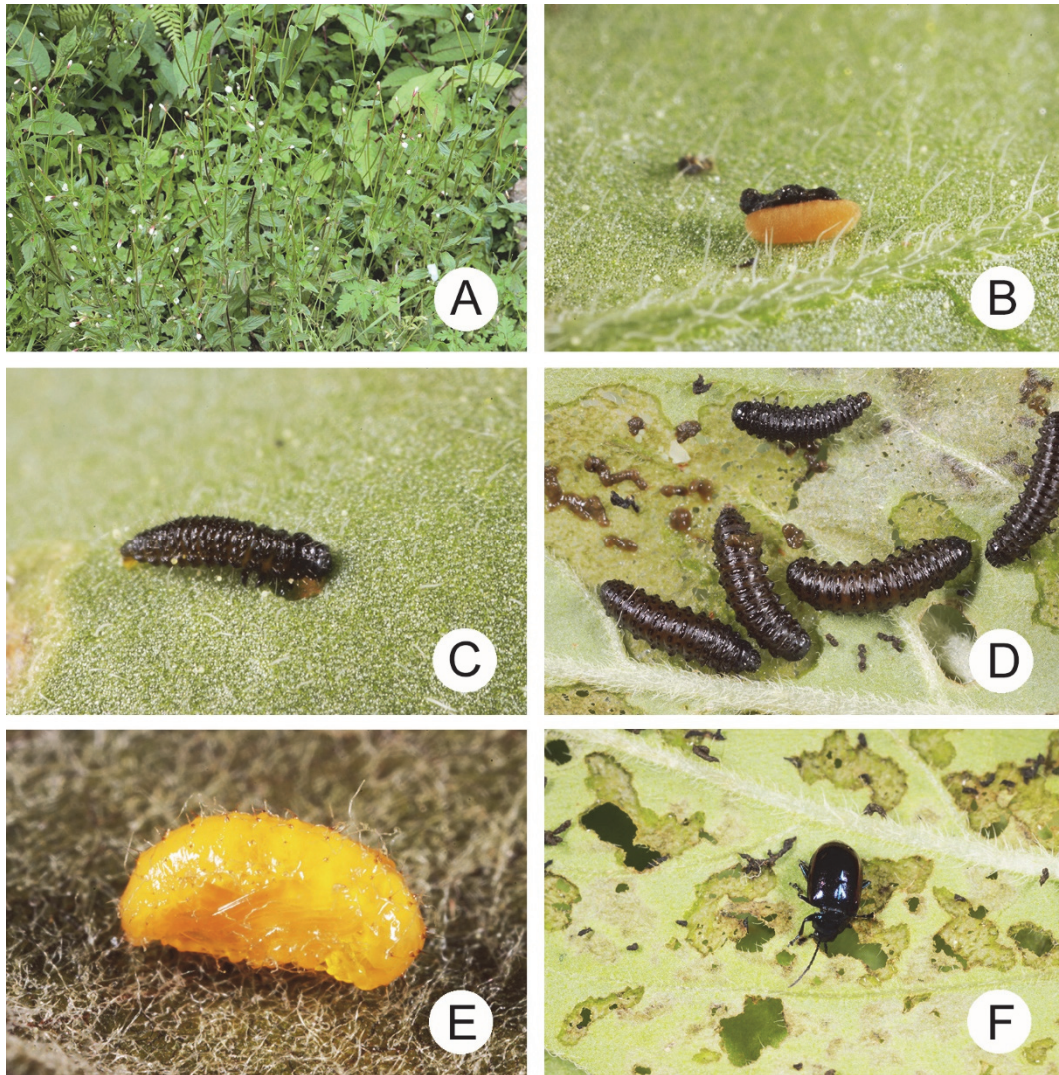


Fig. 6. *Altica chingfui* sp. nov. (A) host plant, *Epilobium amurense*; (B) egg; (C) first-instar larva; (D) third-instar larvae; (E) pupa; (F) adult.

Csiki 1 939: 247 [catalogue].  
Misidentification nec. *A. cyanea* Weber, 1801.

*Altica cyanea* sensu auct.: Chûjô 1963: 26 [distribution record: Formosa]; Chûjô 1965: 98 [distribution record: Formosa]; Kimoto 1966: 35 [distribution record: Taiwan]; Kimoto 1971: 79 [records: Taiwan]; Kimoto 1997: 256, 412 [keys, records: Taiwan]; Takizawa *et al.* 1995: 13 [records: Taiwan]; Kimoto and Chu 1996: 125 [list of Taiwan]; Takizawa 1997: 514 [larva]; Lee and Cheng 2007: 132 [adults, egg, larva, pupa, host plant, biology, faunistics]. Misidentification nec. *A. cyanea* Weber, 1801.

*Altica corrusca*: Bryant and Gressitt 1957: 77.  
Misidentification nec *A. corrusca* Erichson, 1842.

*Haltica nepalensis* Chûjô, 1966: 29 [original

description: type locality E. Nepal]; Kimoto and Takizawa 1973: 179 [synonymy of *A. cyanea* sensu auct.]; Suenaga 2020: 167 [synonymy].

Additional synonymies available in Suenaga (2020).

**Differential diagnosis:** *Altica aenea* is closely allied to *A. birmanensis*; however, they could be differentiated by the characters listed following. Body dark blue (Fig. 7A-D) (*A. birmanensis*: body light blue (Fig. 7E-H)); elytra coarsely punctate (Fig. 7A, D) (*A. birmanensis*: finely punctate); (Fig. 7E, H) aedeagus: swollen apically in lateral view (Fig. 8A-D) (*A. birmanensis*: simple (Fig. 8E-H)); sinuate in lateral view (Fig. 8B, D) (*A. birmanensis*: weakly incurved ventrally in lateral view (Fig. 8F, H)).

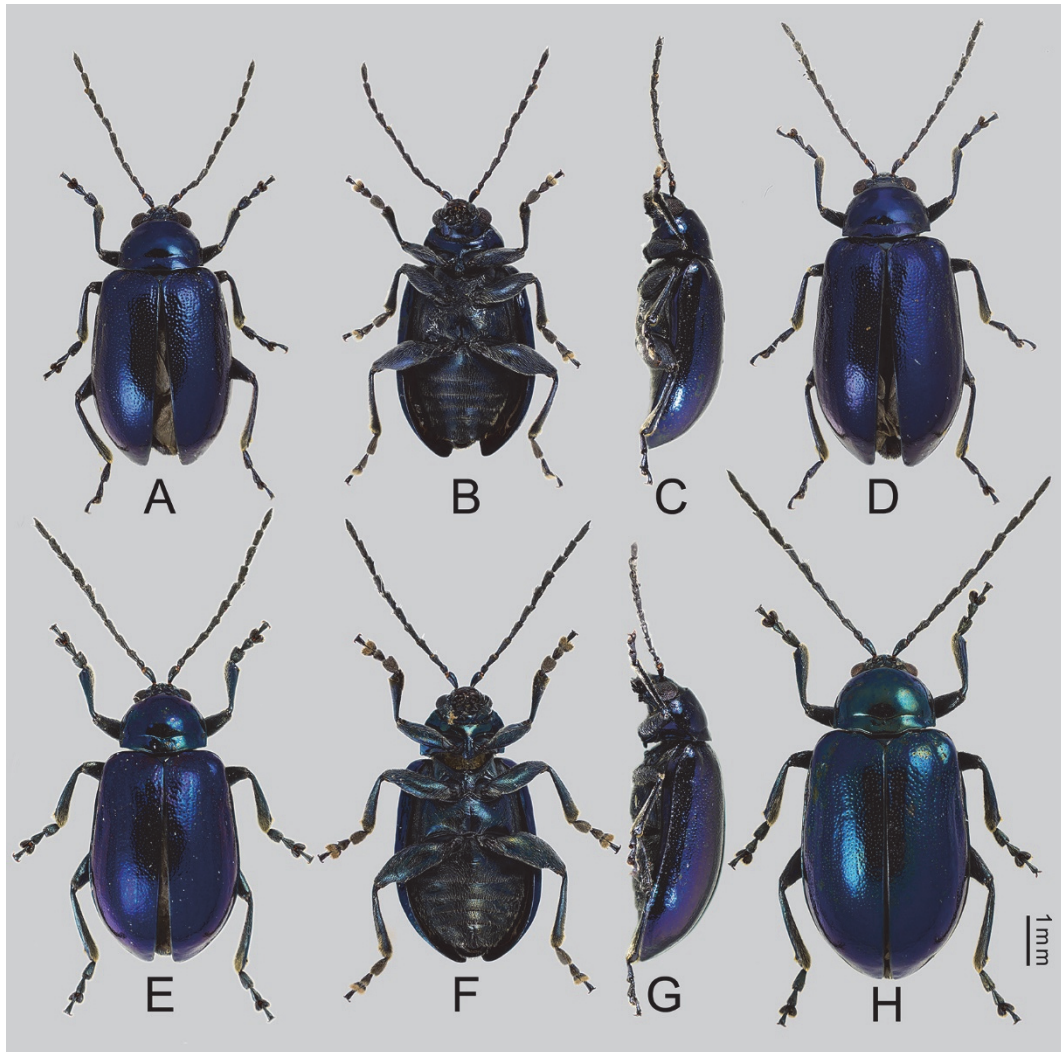


Fig. 7. Habitus. *Altica aenea*: (A) male, dorsal view; (B) ditto, ventral view; (C) ditto, lateral view; (D) female, dorsal view. *Altica birmanensis*: (E) male, dorsal view; (F) ditto, ventral view; (G) ditto, lateral view; (H) female, dorsal view.

**Specimens examined.** TAIWAN. ILAN: 2 ♀ (HSPC: 12060), Chiaosi (礁溪), 7-VII-2009, H.-J. Chen. KAOSHIUNG: 6 ♂ (SEHU), Liukuei (六龜), 20-IV-8-V-1982, H. Takizawa. KINMEN: 3 ♂, 2 ♀ (TARI), Kinmen Island (金門島) but without specific localities, 28-V-2011, Y.-J. Chang; 6 ♂, 3 ♀ (TARI), same island, Botanic Park (植物園), 22-VI-2022, C.-F. Lee. NANTOU: 1 ♂ (SEHU), alt. 600 m, Puli (埔里), 23-25-VI-1979, H. Takizawa. PINGTUNG: 1 ♀ (SEHU), Shizi township, Neiwen (內文), 30-IV-2012, T. Niisato; 1 ♀ (SEHU), Sheding (社頂), 11-VI-2013, S. Tsuyuki. TAINAN: 1 ♂, 1 ♀ (HSPC), Shinhua (新化), VII-2007, L.-W. Lee; TAIPEI: 2 ♂, 1 ♀ (HSPC: HS-21-42, 43; #14088 - #14090), Sanshih (三芝), 11-III-2010, H. Lee; 1 ♂ (HSPC: HS-23-17), Taipei Zoo, 1-II-2007, S.-F. Yu.

**Host plants.** Onagraceae: *Ludwigia epilobioides*

Maxim., *L. linifolia* Poir., *L. ovalis* Miq., *L. peploides* (Kunth) P.H. Raven, *L. peploides* × *L. taiwanensis* C.I. Peng, *L. prostrata* Roxb., *Oenothera glazioviana* Micheli, *O. rosea* L'Hér. ex Aiton, *O. stricta* Ledeb. ex Link, *O. speciosa* Nutt. Lythraceae: *Rotala hippuris* Makino, *R. indica* (Willd) Koehne (Lee and Cheng, 2007; Suenaga, 2020). As a result of the present study, new records of host plants were documented as follows: *Onagraceae*: *Ludwigia octovalvis* (Jacq.) P.H. Raven, Lythraceae: *Ammannia baccifera* L., *Rotala rotundifolia* (Buch.-Ham. ex Roxb.) Koehne.

**Biology.** Suenaga (2020) provided detailed information about the biology of this species.

**Distribution.** East Palearctic, Oriental, and Australian Regions. Taiwan including Kinmen

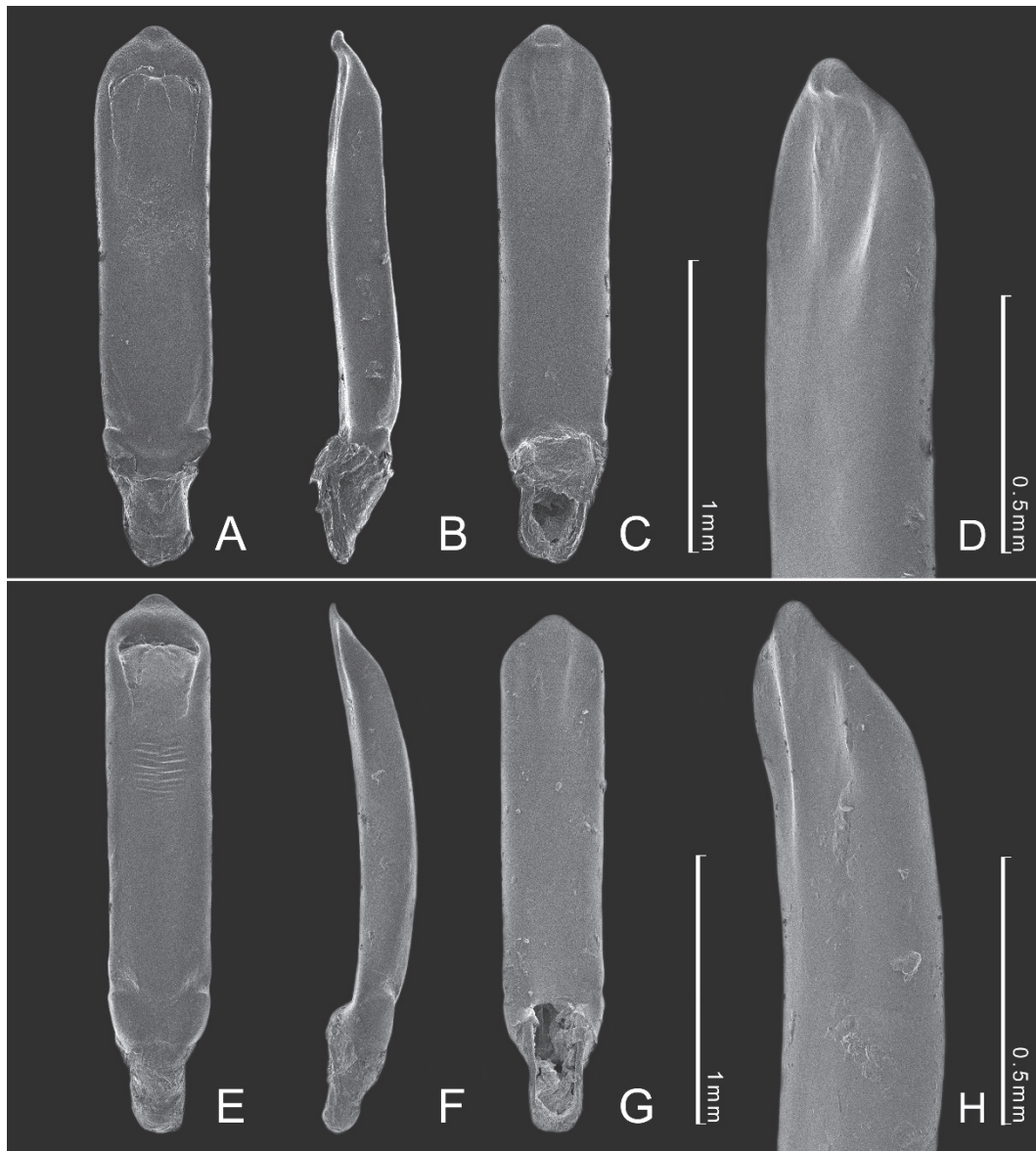


Fig. 8. Male, aedeagus. *Altica aenea* (HS-23-17): (A) dorsal view; (B) ditto, lateral view; (C) ditto, ventral view; (D) ditto, latero-ventral view. *Altica birmanensis* (HS-23-18): (E) dorsal view; (F) ditto, lateral view; (G) ditto, ventral view; (H) ditto, latero-ventral view.

Island (金門島); Afghanistan, Australia, Bhutan, Brunei, Cambodia, China, Fiji, India, Indonesia, Japan (Honshu, Shikoku, Kyusyu, the Ryukyu Islands), Laos, Malaysia (Borneo), Myanmar, Nepal, Pakistan, New Caledonia, Papua New Guinea, Philippines, Singapore, Solomon Islands, South Korea, Sri Lanka, Thailand, Timor Leste, Vanuatu, and Vietnam.

**Remarks.** This species was recorded as *A. cyanea* during previous years (e.g., Weise, 1922; Chen, 1934; Chûjô, 1963; Kimoto 1966, 1971, 1997; Takizawa, 1997; Lee and Cheng, 2007). Reid and Beatson (2015) resurrected *A. aenea* from synonymy with *A. cyanea*, and they also

pointed out that almost all records of *A. cyanea*, including those from Taiwan, were misidentifications of *A. aenea*. Suenaga (2020) recorded *A. aenea* from Taiwan based on the redescription by Reid and Beatson (2015). In this study, *A. cyanea* was removed from the Taiwanese fauna as misidentifications of *A. aenea* based on the conclusions of Reid and Beatson (2015) and Suenaga (2020).

Adults of *Altica aenea* were initially found on Kinmen Island (金門島) by Chang (2011). There should be substantial populations due to abundant host plants growing along irrigation channels.

*Altica birmanensis* (Jacoby, 1896)  
(Figs 7E-H, 8E-H)

*Haltica birmanensis* Jacoby, 1896: 254 [original description; type locality Burma]; Maulik 1926: 422 [as a junior synonym of *A. cyanea*].

*Altica birmanensis*: Gressitt and Kimoto 1963: 890 [as a junior synonym of *A. cyanea*]; Kimoto and Chu 1996: 125 [list of Taiwanese species]; Kimoto 1997: 256, 412 [adult, records: Taiwan, Burma]; Takizawa 1997: 513 [last instar larva, pupa, biology, host plant]; Lee and Cheng 2007: 130 [adult, egg, larva, pupa, host plant, biology]; Chang 2011: 112 [records: Taiwan: Kinmen]; Reid and Beatson 2015: 524 [key, records: Indonesia, Taiwan, Timor Leste, Vietnam, Lectotype designation]; Suenaga 2020: 170 [redescription, faunistics].

*Altica birmaensis* [sic!]: Scherer 1969: 129 [as a junior synonym of *A. cyanea*].

*Altica birmensis* [sic!]: Kimoto 1971: 80 [resurrected from synonymy with *A. caerulea*, records: Taiwan]; Takizawa 1978: 78 [larva, records: Taiwan]; Takizawa 1979: 351 [host plant]; Takizawa *et al.* 1995: 12 [records: Taiwan].

*Haltica brevicosta*: Chen 1934: 180 [records: Formosa (Daitotei)]; Chûjô 1936: 28 [records: Formosa]; Heikertinger and Csiki 1939: 247 [catalogue]; Kimoto 1971: 80 [synonymed with *A. caerulea* (Olivier, 1791)].

*Altica caerulea* (Olivier) [misidentification]: Kimoto 1997: 256 [records: India, Indochina, China, Taiwan, Philippine and Java].

*Altica coerulea* (Olivier) [sic! misidentification]: Kimoto 1966: 35 [records: Taiwan]; Kimoto 1971: 80 [distribution record: Taiwan]; Kimoto and Chu 1996: 125 [list of Taiwan].

*Haltica indica* Shukla, 1960: 80 [original description: type locality India]; Reid and Beatson 2015: 524 [synonymy].

*Haltica cyanea* [misidentification]: Chûjô 1936: 28 [records: Formosa (including Samosana Is. (= Green Island, 綠島) and Botel-Tobago Is. (= Lanyu Island, 蘭嶼)), host plant]; Wu 2003: 94 [records: Taiwan: Matsu Islands].

Further detailed synonym list is available from Suenaga (2020).

**Specimens examined.** TAIWAN. CHANGHUA:

1 ♀ (SEHU), Oanlim (員林), 10-IX-2008, T. Mizusawa. CHIAYI: 1 ♂ (HSPC), Chungpu (中埔), 3-III-2010, H.-T. Shih; 1 ♀ (SEHU), Fenchihu (奮起湖), 11-12-VII-1981, H. Takizawa. HSINCHU: 2 ♂, 1 ♀ (HSPC: HS-23-18), Kuanwu (觀霧), 30-IV-2009, Y.-F. Hsu; 1 ♂, 1 ♀ (HSPC), same locality, 19-VII-2009, Y.-F. Hsu; 1 ♂ (HSPC), same locality, 20-IV-2010, C.-F. Lee; 4 ♀ (HSPC), same data but with “28-V-2009”. ILAN: 1 ♀ (SEHU), Chienching (見晴), 18-IV-1967, S. Fukuda; 2 ♂, 3 ♀ (SEHU), Ilenlin, 8-15-III-1999, T. Mizusawa; KAOSHIUNG: 6 ♂, 5 ♀ (SEHU), Nanfengshan (南鳳山), 28-IV-1981, S. Fukuda; 1 ♀ (HSPC), Tonalintao (多納林道), 5-IV-2010, U. Ong; 6 ♂, 4 ♀ (SEHU), Liukuei (六龜), 20-26-III-1995, H. Takizawa; 1 ♂, 5 ♀ (SEHU), Kaoshan, 25-III-1995, H. Takizawa; 3 ♂, 3 ♀ (SEHU), Paolai (寶來), 21-III-1995, H. Takizawa; 1 ♀ (SEHU), Shanping (扇平), 12-V-1996, S. Tsuyuki; 1 ♂ (SEHU), Tehuashe (德化社), 29-30-IV-1981, S. Fukuda; 3 ♂, 2 ♀ (SEHU), Wukongshan (五公山), 23-III-1995, H. Takizawa; 3 ♀ (SEHU), same data but with “2-V-1996”. KINMEN: 1 ♀ (TARI), Kinmen Island (金門島), Shanxi (山西), 26-X-2002, H. T. Shih; 1 ♀ (TARI), same island, Agricultural Research Institute (農業試驗所), 1-27-VIII-2001, Y. S. Lee, H. C. Huang, H. T. Shih. MATSU: 7 ♂, 11 ♀ (TARI), Beigan Island (北竿島), Biyuan Park (碧園), 6-VI-2002, H. T. Shih; 7 ♂, 3 ♀ (TARI), same island but without specific localities, 29-VI-2017, H.-T. Fang; 3 ♂ (TARI), same island but without specific localities, 24-VII-2019, C.-H. Hsieh; 2 ♂, 6 ♀ (TARI), Dongju Island (東莒島) but without specific localities, 27-VI-2017, H. T. Fang; 4 ♂, 3 ♀ (TARI), Nangan Island (南竿島) but without specific localities, 20-V-2002, C. F. Chen; 1 ♂, 1 ♀ (TARI), same island, Agricultural Research and Extension Station (農業改良場), 20-VII-2002, H. C. Lai and C. F. Chen; 1 ♂, 1 ♀ (TARI), same island but without specific localities, 20-VI-2002, H. T. Shih; 2 ♂, 3 ♀ (TARI), same island but without specific localities, 28-VI-2017, H.-T. Fang; 2 ♂, 3 ♀ (TARI), Xiju Island (西莒島), Xiqu Village (西坵村), 5-VI-2002, H. T. Shih; 6 ♀ (TARI), same island but without specific localities, 27-VI-2017, H.-T. Fang. NANTOU: 1 ♂ (SEHU), Hotsu, 6-VI-1976, J. Okuma; 2 ♂, 3 ♀ (SEHU), Huisunlinchang (惠蓀林場), 4-V-1985, K. Kusama; 1 ♂ (SEHU), Huxi (湖西村), 12-13-III-2004, T. Mizusawa; 1 ♂ (SEHU), Kaofeng, 31-VII-1985, H. Takizawa; 1 ♂

(SEHU), Liyuetan (日月潭), 5-V-1985, K. Kusama; 1 ♀ (SEHU), Musha (霧社), 5-V-1979, S. Fukuda; 4 ♂, 11 ♀ (SEHU), same locality (= Wushe), 18-V-1971, K. Sakai; 1 ♂ (SEHU), Nanshanshi (南山溪), 9-VI-1970, S. Fukuda; 1 ♀ (SEHU), same data but with “11-VI-1970”; 1 ♂ (SEHU), same data but with “10-VI-1970”; 1 ♂ (SEHU), same locality, 16-V-1971, K. Sakai; 24 ♂, 17 ♀ (SEHU), same data but with “21-V-1971”; 1 ♀ (SEHU), same locality, 5-V-1979, S. Fukuda; 1 ♂, 1 ♀ (SEHU), same locality, 1-12-VII-1983, H. Takizawa; 1 ♂ (SEHU), same data but with “31-VII-1985”; 3 ♂, 2 ♀ (SEHU), same data but with “19-VII-1995”; 1 ♂ (SEHU), same data but with “14-VIII-1995”; 1 ♂ (SEHU), alt. 600 m, Puli (埔里), 23-VI-1979, M. Suwa; 1 ♀ (SEHU), same locality, 22-VII-1995, H. Takizawa; 6 ♂, 3 ♀ (SEHU), Sungkang (松崗), 17-IV-1967, S. Fukuda; 2 ♂, 1 ♀ (SEHU), same data but with “15-VI-1970”; 2 ♂ (SEHU), same locality, 8-VII-1983, H. Takizawa; 3 ♂, 8 ♀ (SEHU), Tungpo (東埔), 16-18-VII-1995, H. Takizawa; 2 ♂, 1 ♀ (SEHU), Hoshe, Tungpu, 26-VI-2000, L.-Y. Chou; 1 ♂ (SEHU), Tsuifeng (翠峰), 4-V-1979, S. Tsuyuki; 1 ♂, 3 ♀ (SEHU), same locality, 20-21-VII-1995, H. Takizawa; 1 ♀ (HSPC: 4417), Wanfengtsun (萬豐村), 2-IV-2008, W.-T. Liu. PINGTUNG: 1 ♂, 1 ♀ (SEHU), Keiting park (墾丁公園), 3-V-1971, K. Sakai. TAOYUAN: 1 ♂, 2 ♀ (SEHU), Palin (巴陵), 2-4-VII-1983, H. Takizawa; 1 ♀ (SEHU), Sanguang (三光), 29-IV-1974, S. Fukuda; 1 ♀ (SEHU), Erjitan, 21-III-2004, T. Mita; 1 ♀ (SEHU), Sihling (四陵), 3-5-V-1981, S. Fukuda. TAINAN: 1 ♀ (SEHU), Kuantziling (關仔嶺), 29-IV-1971, K. Sakai; 1 ♀ (SEHU), Meiling (梅嶺), 11-VI-1970, S. Fukuda; 1 ♀ (SEHU), same data but with “3-V-1979”; 2 ♂ (SEHU), same data but with “4-V-1979”; 1 ♂ (HSPC), same locality, 23-VI-2010, U. Ong. TAIPEI: 1 ♂, 1 ♀ (SEHU), Chuwei (竹圍), 30-VII-2007, H.-T. Cheng; 1 ♀ (SEHU), Urai (烏來), 29-VIII-1967, M. Nishikawa; 2 ♂, 1 ♀ (SEHU), same locality, 13-XI-1978, J. Okuma; 3 ♂, 2 ♀ (SEHU), same locality, 28-II-2007, T. Niisato; 4 ♂ 1 ♀ (SEHU), Yangmingshan (陽明山), 14-VII-1995, H. Takizawa; 1 ♂ (SEHU), same data but with “28-IV-1996”. Taichung: 3 ♀ (SEHU), Chungsing Hsintsun (中興新村), 6-V-1996, H. Takizawa. TAITUNG: 1 ♀ (SEHU), Chippen (知本), 14-VIII-1968, M. Nishikawa; 1 ♂, 1 ♀ (SEHU), same locality, 18-IX-2008, T. Mizusawa; 3 ♂ (SEHU),

Lanhsu (= Lanyu Island, 蘭嶼), 9-V-1971, K. Sakai; 1 ♂ (HSPC: #16402), Motien (摩天), 23-VI-2010, M.-H. Tsou.

**Host plants.** Polygonaceae: *Persicaria chinense* (L.) H. Gross (Chûjô, 1936).

**Biology.** Suenaga (2020) provided detailed information about this species.

**Distribution.** Taiwan, including Green Island (綠島), Lanyu Island (蘭嶼), Kinmen Island (金門), Beigan (北竿), Nangan (南竿), Xiju (西莒), Dongju (東莒); India, Indonesia, Japan (the Ryukyu Islands), Laos, Myanmar, Philippines, Thailand, Timor Leste, Vietnam.

**Remarks.** Reid and Beatson (2015) also recorded *A. birmanensis* from Taiwan, and they also pointed out that many records of *A. cyanea* and *A. caerulea* were based on confusion with this species. Several publications (e.g., Kimoto, 1997) have stated that the “indistinct costa on shoulder of elytron” is diagnostic for *A. caerulea*. However, this character often occurs in *A. birmanensis*. Additionally, we examined many Taiwanese specimens of *Altica* but did not confirm “true” *A. caerulea*, as defined by Reid and Beatson (2015). Thus, we remove *A. caerulea* from the Taiwanese chrysomelid fauna.

*Altica birmanensis* is common in Taiwan, including Green Island (綠島) and Lanyu Island (蘭嶼), and is one of many Taiwanese species treated in Suenaga (2020). Wu (2003) indicated that this species is common on the Matsu Islands. Adults have been recorded from four islands (Beigan Island 北竿島, Nangan Island 南竿島, Dongju Island 東莒島, Xiju Island 西莒島) based on examinations of specimens (see above). Adults were found in Kinmen Island (金門島), too, but are more patchy in distribution (Chang, 2011), probably because of less common occurrences of host plants based on recent field investigations.

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## References

- Blackburn T.** 1889. Further notes on Australian Coleoptera with descriptions of new genera and species. Proc Linn Soc N S Wales, 2nd ser 3: 1387-1506.
- Blackburn T.** 1896. Further notes on Australian Coleoptera with descriptions of new genera and species. Trans Proc Rep R Soc S Australia 20: 35-109.
- Bryant FE, Gressitt JL.** 1957. Chrysomelidae of Fiji (Coleoptera). Pacif Sci 11: 3-91.
- Chang Y-J.** 2011. [A Field Guide to the Insects of Kinmen 2.] Kinmen: Kinmen National Park. 279 pp. (in Chinese)
- Chen S-H.** 1933-1934. Some species of Halticinae from Canton. Peking N Hist Bull 8: 43-58.
- Chen S-H.** 1934. Coléoptères Halticinae recueillis par M. H. Sauter a Formose. Ann Soc Entomol Fr 103: 175-185.
- Chen S-H.** 1936. Notes on some flea-beetles from tropical Asia (II). Sinensia 7: 80-88.
- Chevrolat LAA.** 1836. [new taxa]. pp. 361-443. In: Dejean PFMA (ed.). Catalogue des Coléoptères de la collection de M. le Comte Dejean. [Livraison 5]. Méquignon-Marvis, Paris.
- Chevrolat LAA.** 1845. *Graptodera*. P. 307. In: D'Orbigny, C. (ed.) Dictionnaire Universel d'Histoire Naturelle. Tome sixième, 792 pp.
- Chûjô M.** 1936. Studies on the Chrysomelidae in the Japanese Empire (VIII) Subfamily Halticinae (4). Trans N Hist Soc Formosa 26: 15-30.
- Chûjô M.** 1963. Chrysomelid-beetles from Formosa (Taiwan) collected by Dr. K. Baba in 1962. Niponius 2: 21-29.
- Chûjô M.** 1965. Chrysomelid-beetles of Formosa (I). Spec Bull Lep Soc Jap 1: 88-104.
- Chûjô M.** 1966. Chrysomelid-beetles from Northeast Nepal. Mem Fac Lib Arts Educ Kagawa Uni 2: 1-35.
- Döberl M.** 2010. Alticinae. pp. 491-563. In: Löbl I. and Smetana A (eds). Catalogue of Palaearctic Coleoptera, 6. Apollo books, Stenstrup.
- Fabricius, JC.** 1775. Systema Entomologiae, sistens Insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus. Officina Libraria Kortii, Flensburgi et Lipsiae. 832 pp.
- Furth DG.** 1980. *Altica* of Israel (Coleoptera: Chrysomelidae: Alticinae). Israel J Entomol 14: 55-66.
- Geoffroy EL.** 1762. Histoire abrégée des insectes qui se trouvent aux environs de Paris. Tome I. Durand, Paris. 523 pp.
- Geoffroy EL.** 1764. Histoire abrégée des insectes dans laquelle ces animaux sont ranges suivant un ordre méthodique. Tome I. Durand, Paris. 523 pp.
- Geoffroy EL.** 1799. C. Volland and Rémont, Paris. 556 pp.
- Germain P.** 1903. Lista de los insectos tradidos por los Senores Reiche i Machado de un viaje á Lebu y á La Mocha. Anales Mus Nac Chile 16: 49-63.
- Gressitt JL.** 1955. Insects of Micronesia Coleoptera: Chrysomelidae. Ins Micronesia

- 17: 1-60.
- Gressitt JL, Kimoto S.** 1963. The Chrysomelidae (Coleopt.) of China and Korea, part 2. Pac Ins Mon 1B: 301-1026.
- Heikertinger F.** 1924. Die Halticinengenera der Palaearktis und Nearktis. Bestimmungstabellen. (Monographie der palaearktischen Halticinen: Systematischer Teil. - Zeites Stück.). Koleopt Rdsch 11: 25-48.
- Heikertinger F, Csiki E.** 1939. Chrysomelidae: Halticinae I. In: Schenkling S. (ed.). Coleopterorum Catalogus. Pars 166. W. Junk, S-Gravenhage. 336 pp.
- ICZN.** 1994. Opinion 1754. Histoire abrégée des Insectes qui se trouvent aux environs de Paris (Geoffroy, 1762): some generic names conserved (Crustacea, Insecta). Bull Zool Nomen 51: 58-70.
- Illiger JCW.** 1801. Namen der Insekten-Gattungen, ihr Genitiv, ihr grammatisches Geschlecht, ihr Silbenmass, ihre Herleitung; Zugleich mit den Deutschen Benennungen. Mag f Insek 1: 125-156.
- Illiger JCW.** 1807. Verzeichnis der Arten der Flohkäfer, Halticae, in der Hellwig-Hoffmanseggischen Sammlung, mit Beschreibung der neuen und Bezeichnung der übrigen Arten. Mag f Insek 6: 81-177.
- Jacobson GG.** 1892. Conspectus specierum generis *Haltica* Geoff. ex Asia media hucusque notarum. Hor Soc Entomol Ross 26: 462-467.
- Jacoby M.** 1896. Descriptions of new genera and species of phytophagous Coleoptera obtained by Mr. Andrewes in India. Part II Chrysomelidae, Halticinae and Galerucinae. Ann Soc Entomol Belg 40: 250-304.
- Jacoby M.** 1904. Descriptions of new genera and species of phytophagous Coleoptera obtained by Dr Loria in New Guinea. Ann Mus Civ Stor Nat Genova, ser. 3, 41: 469-514.
- Kimoto S.** 1966. A list of specimens of Chrysomelidae from Taiwan preserved in the Zoological Museum, Berlin. Esakia 5: 21-38.
- Kimoto S.** 1971. Notes on the Chrysomelidae from Taiwan VI. Entomol Rev Japan 23: 73-87.
- Kimoto S.** 1997. Volume Adult. pp. 1-427. In: Kimoto S, and Takizawa H (eds) Leaf Beetles (Chrysomelidae) of Taiwan. Tokai University Press, Tokyo. (In Japanese, with English keys and synonym list.)
- Kimoto S, Chu YI.** 1996. Systematic Catalog of Chrysomelidae of Taiwan. Bull Comp Stud Int Cult Soc Kurume Univ 16: 1-152.
- Kimoto S, Takizawa H.** 1973. The Chrysomelid-beetles of Nepal, collected by the Hokkaido University Scientific Expedition to Nepal Himalaya, 1968. Part II. Kontyû 41: 170-180.
- Konstantinov AS, Lingafelter SW.** 2002. Revision of the Oriental species of *Apthona* Chevrolat (Coleoptera: Chrysomelidae). Miscellaneous Publication of the Entomological Society of Washington, The Entomological Society of Washington, Washington, DC. 349 pp.
- Latreille PA.** 1810. Considérations générales sur l'ordre naturel des animaux composant les classes des Crustacés, des Arachnides et des Insectes; avec un tableau méthodique de leurs genres, disposés en familles. F. Schoell, Paris. 444 pp.
- Lee C-F, Cheng H-T.** 2007. The Chrysomelidae of Taiwan 1. Sishou-Hills Insect Observation Network, New Taipei City. 199 pp. (In Chinese)
- LeSage L.** 1995. Revision of the costate species of *Altica* Müller of North America North of Mexico (Coleoptera: Chrysomelidae). Canad Entomol 127: 295-411.
- Mahendiran G., Dar MA., Akbar SA.** 2019. *Altica himalayensis* (Chen), an emerging pest of temperate horticultural crops from Kashmir valley. Halteres 10: 7-18.
- Maulik S.** 1926. The Fauna of British India, including Ceylon and Burma. Coleoptera. Chrysomelidae, Chrysomelinae and Halticinae. Taylor and Francis. London. 442 pp
- Müller OF.** 1764. Fauna insectorum Fridrichsdalina, sive methodica descriptio insectorum agri Fridrichsdalensis cum characteribus genericis specificis, nominibus trivialibus, locis natalibus, iconibus allegatis, novisque pluribus specibus additis. I. F. Gleditsch, Hafniae and Lipsiae. 96 pp.
- Olivier AG.** 1791. Encyclopédie méthodique, ou par ordre de matières: par une société de gens de lettres, de savans et d'artistes; précédée d'un vocabulaire universel,

- servant de table pour tout l'ouvrage, ornée des portraits de Mm. Diderot et d'Alembert, premiers éditeurs de l' Encyclopédie. Histoire naturelle. Insectes. Tome sixième. Pars 1. Panckoucke, Paris. 704 pp.
- Olivier AG.** 1808. Entomologie, ou histoire naturelle des insectes, avec leurs caractères génériques et spécifiques, leur description, leur synonymie et leur figure enluminée. Coléoptères. Tome sixième. Desray, Paris. pp. 613-1104.
- Reid CAM, Beatson M.** 2015. Disentangling a taxonomic nightmare: a revision of the Australian, Indomalayan and Pacific species of *Altica* Geoffroy, 1762 (Coleoptera: Chrysomelidae: Galerucinae). Zootaxa 3918: 503-551.
- Scherer G.** 1969. Die Alticinae des indischen Subkontinentes (Coleoptera-Chrysomelidae). Pacif Ins Mon 22: 1-251.
- Scherer G.** 1982. Erichson-Typen im Zoologischen Museum, Berlin (Coleoptera - Chrysomelidae - Alticinae). Dts Entomol Zts 29: 479-481.
- Shukla SP.** 1960. Entomological survey of Himalaya. Part XXX-On some Chrysomelidae (Coleoptera) from the North-West (Punjab) Himalaya. Agra Univ J Res (Sci) 9: 65-88.
- Suenaga H.** 2020. A revision of the genus *Altica* (Coleoptera: Chrysomelidae: Galerucinae) of Japan. Jpn J Syst Entomol Suppl Ser 2: 163-258.
- Takizawa H.** 1978. Notes on Taiwanese Chrysomelid larvae, V. Entomol Rev Japan 31: 75-84.
- Takizawa H.** 1979. Notes on Taiwanese Chrysomelidae, III. Kontyû 47: 340-351.
- Takizawa H.** 1997. Volume Larva. pp. 429-547. In: Kimoto S, Takizawa H (eds). Leaf Beetles (Chrysomelidae) of Taiwan. Tokai University Press, Tokyo. (In Japanese, with English keys.)
- Takizawa H, Nakamura S, Kojima K.** 1995. The Taiwanese chrysomelid beetles preserved in Hiwa Museum for Natural History (Chrysomelidae: Coleoptera). Misc Rep Hiwa Mus 33: 1-16. (In Japanese with English title and abstract.)
- Weise J.** 1888. Chrysomelidae. Lieferung 5. pp. 769-960. In: Erichson WF (ed.). Naturgeschichte der Insecten Deutschlands. Erste Abtheilung. Coleoptera. Sechster Band. Nicolaische Verlags Buchhandlung, Berlin.
- Weise J.** 1922. Chrysomeliden der Indo-Malayischen Region. Tijds Entomol 65: 39-130.
- Weise J.** 1923. Results of Dr. E. Mjöberg's Swedish Scientific Expedition to Australia 1910-1913. 31. Chrysomeliden und Coccinelliden aus Queensland. Ark Zool 15: 1-150.
- Wu, W.-J.** 2003. The Insects of Matsu. Lienchaign County Government, Nangan, 192 pp. (in Chinese)



# 台灣產藍葉蚤屬的分類研究：對於 *A. himalayensis* (Chen)、*A. cyanea* (Weber) 及 *A. caerulea* (Olivier) (鞘翅目：金花蟲科：螢金花蟲：葉蚤族) 分類地位的重新評估

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## 摘 要

*Altica himalayensis* (Chen) 的台灣紀錄是錯誤鑑定。本文以新種發表為高山藍葉蚤 *Altica chingfui* **sp. nov.**，雄性生殖器以掃描式電子顯微鏡拍照，雌性生殖器以針筆繪圖，並摘錄其生物學。深藍葉蚤之前被錯誤鑑定為 *A. cyanea* (Weber)，正確有效名為 *A. aenea* (Olivier)；緬甸藍葉蚤之前被錯誤鑑定為 *A. caerulea* (Olivier)，正確有效名為 *A. birmanensis* (Jacoby)。

**關鍵詞：**分類學、動物地理學、生物學、金花蟲、葉蚤