

Research articleSubmitted: September 17th, 2018 - Accepted: November 9th, 2018 - Published: December 31st, 2018**Notes on genus *Epitrichius* Tagawa, 1941 in Vietnam, with description of a new species and a new synonym (Coleoptera: Scarabaeidae, Cetoniinae)**

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Abstract

The study of several specimens of *Epitrichius* recently caught in central and southern Vietnam allowed to put in synonymy one species and to describe a new one, which extends considerably southwards the distribution area of the genus.

Key words: Scarabaeidae, Cetoniinae, *Epitrichius*, new species, new synonym, Vietnam.

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Introduction

In their revision of the genus *Epitrichius* Tagawa, 1941, Chun-Lin Li et al. (2008) listed three species inhabiting northern and central Vietnam: *Epitrichius bowringi* (Thomson, 1857), *Epitrichius fraterculus* (Moser, 1901) and *Epitrichius versutus* (Krikken, 1972). Later on, Krajcik (2012) described, on the basis of one female, a new species from SE Laos, *Epitrichius jakli* Krajcik, 2012, whose male was unknown. The study of new material collected in central and southern Vietnam allows now to assert that *E. jakli* is a junior synonym (**new synonymy**) of *E. bowringi*. Furthermore, six specimens collected in the mountains of southern Vietnam belongs to a new species, *Epitrichius australis* **new species**, here described. The new entity considerably extends southwards the distribution area of *Epitrichius* (Fig. 5). Finally, an updated dichotomic key of all so far known *Epitrichius* species is provided.

Material and methods

Specimen length was measured between the apex of the pygidium and the anterior margin of the pronotum. Specimen width is the maximum distance across the elytra. Clypeal length was measured laterally, between the anterior margin and basal attachment of the antenna.

Photographs were taken using a Nikon Coolpix P7700 attached to one of the eyepieces of a Wild dissecting microscope. All photos were processed with photo stacking software (Zerene Stacker Version 1.04 Build T201711041830, <http://www.zereneystems.com>) and backgrounds were

removed using GIMP 2.10.4, in order to increase contrast. Individual photographs were finally merged to generate composite images using same GIMP software.

The following abbreviations are used to denote the housing location of the study material:

- ERC** Enrico Ricchiardi collection, Torino, Italy.
- NHM** The Natural History Museum, London, Great Britain (depositare qui HT di australis?)
- NHMP** Natural History Museum Praha, Czech Republic.
- NMER** Naturkunde Museum Erfurt, Germany
- SJC** Stanislav Jakl Collection, Prague, Czech Republic
- ZFMK** Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany

Results

Li et al. (2008, Figs 8-12) proposed to put in synonymy *Epitrichius bifasciatus* (Moser, 1901) and *Epitrichius miyashitai* Krajcik, 2006 with *Epitrichius bowringi* (J. Thomson, 1857) on the basis of the shape of the parameres and the *major hook* of internal sac of males (ditto, Fig. 17), considered by them “*highly consistent species-specific*”; moreover, they extended the distribution area of *E. bowringi* to northeastern Laos; they themselves wrote that “*The number of denticles of the dorsal ridge* (ditto, Figs 5 and 6) *varies among individuals of each species*”, questioning the constancy of the shape of the major hook and, ultimately, its use in the separation of species.

To verify the subject, I analyzed the shape of para-

meres and major hook of many males collected all around the distribution area of *E. bowringi* (sensu Li et al. 2008), with the following results:

- The shape of the major hook varies greatly, up to extreme of one male collected in Ngoc Linh Mountains (Kon Tum, 1700 m), where the denticles are completely absent (Fig. 4 I-L).
- The shape of parameres of specimens from China, Laos, northern and central Vietnam indeed, is always within the range of *E. bowringi* as proposed by Li et al. (2008), Figs 8-12, and all the synonymies proposed by them are therefore confirmed.

It is however important to highlight that many of the males of *E. bowringi* collected in Ngoch Linh exhibit often an unusually wrinkled (for this species) pronotum surface, glabrous and with shining metallic lustre and a peculiar elytral pattern, while they normally show a dully velutinous and not shining surface. These last two characters were used by Krajcik (2012) to separate his new species *Epitrichius jakli* Krajcik, 2012 from other known *Epitrichius*. The new species was described by Krajcik on the base of a female (Fig. 3) collected in Dong Amphan Montain, southeastern Laos, close to the Vietnamese border (see Fig. 5).

Many of the ten specimens collected at Ngoch Linh (5♂ and 5♀) – locality only 50 km away from the locus typicus of *E. jakli* – show pronotum sculpture and elytral

pattern as in *E. jakli*, but males specimens exhibit the typical shape of paramera known in *E. bowringi* (Fig. 4). For this reason, *Epitrichius jakli* Krajcik, 2012 must be considered as junior synonym of *Epitrichius bowringi* (J. Thomson, 1857) (**new synonymy**).

Wrinkled pronotum and elytral pattern are also shared with some *Epitrichius* that Dang Ngoc Van collected on the mountains of Southern Vietnam, about 300 km south of Ngoch Linh and belonging to a new species, *Epitrichius australis* **new species**, described below (Figs 1 and 2).

As already appears from the key of the species published by Li et al. (2008), *Epitrichius* can be separated in two species groups. Although Li et al. (2008) did not formally established these groups, enough morphological characters were listed, and both groups are explicitly treated and formalized herein (see the key presented below).

Taxonomy

Epitrichius australis **new species** (Figs 1 and 2)

Type series. Holotype ♂ NHM, **Vietnam:** Lam Dong, Da Lat, Apr 2017, Dang Ngoc Van legit. 1 PT♀ ERC, **Vietnam:** Nha Trang, Hon Ba Natural Reserve, Jul 2015, Dang Ngoc Van legit. 4 PT♂ ERC, **Vietnam:** Dak Lak, Chu Yang Sinh, May 2017, Dang Ngoc Van legit.

Description of holotype. Length 15.4 mm; maximum elytral width 8.0 mm. Oval-elongate, overall black. Elytra,

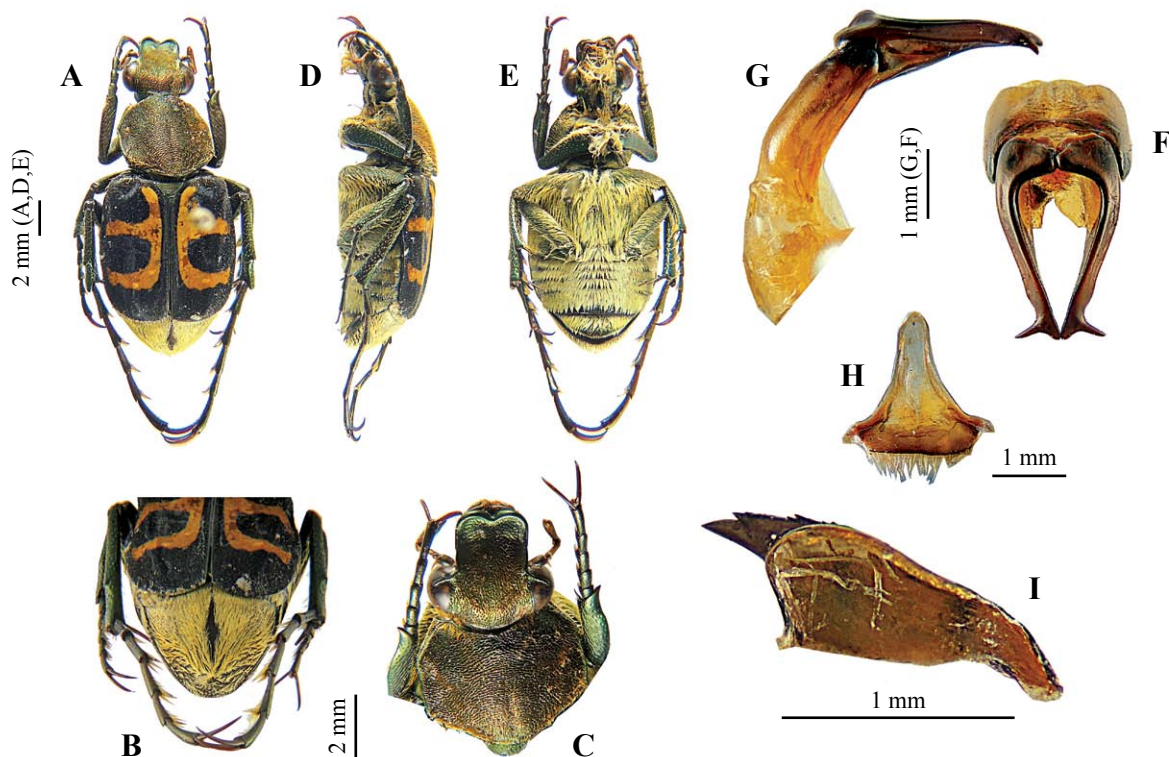


Fig. 1 – *Epitrichius australis* new species HT♂ NHM: **A**, dorsal habitus. **B**, pygidium. **C**, head. **D**, lateral habitus. **E**, ventral habitus. **F**, parameres, dorsal view. **G**, parameres, lateral view. **H**, spiculum gastrale. **I**, first internal sac armature.

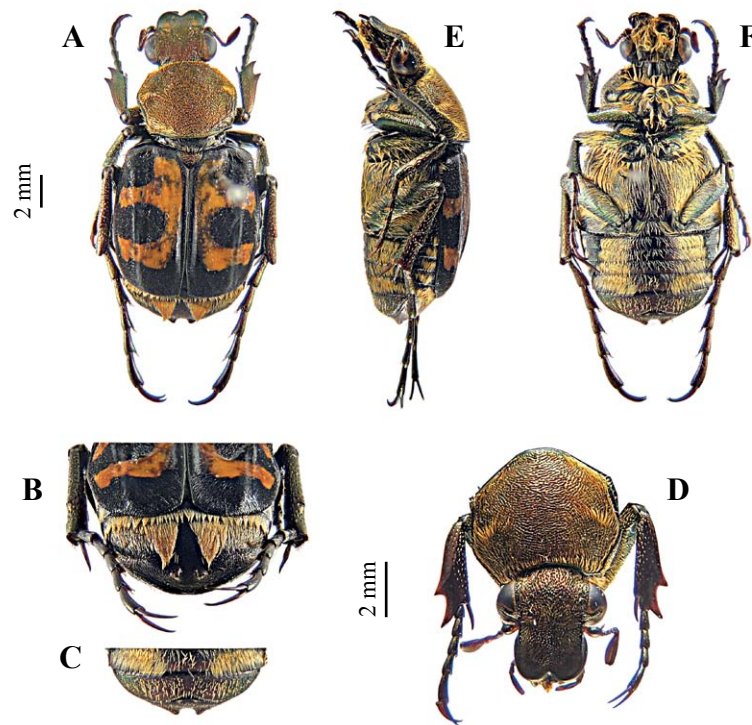


Fig. 2 – *Epitrichius australis* new species PT♀ ERC: **A**, dorsal habitus. **B**, pygidium. **C**, apex of pygidium in ventral view. **D**, head. **E**, lateral habitus. **F**, ventral habitus.

black with two dull yellow, transverse bands joined with similar band along the suture. Pronotum, head, clypeus, scutellum and legs with shining metallic lustre.

Head. Surface glabrous, rugose punctures lengthwise developed and distributed along sides and eyes, size of punctures becoming gradually smaller anteriorly. Anterior margin of clypeus bilobed with very tiny and sparse punctures marginally. Vertex punctures unevenly distributed.

Antennae. Black with metallic lustre. Clubs a bit shorter than clypeus length.

Pronotum. Widest before mid of length, approximately hexagonal, with basolateral angles rounded, angulate beneath, lateral margin well defined. Surface wrinkled, with small, very scattered, testaceous setae, denser near the margins. Scutellum triangular, broader than long, rounded at apex, glabrous, strongly wrinkled.

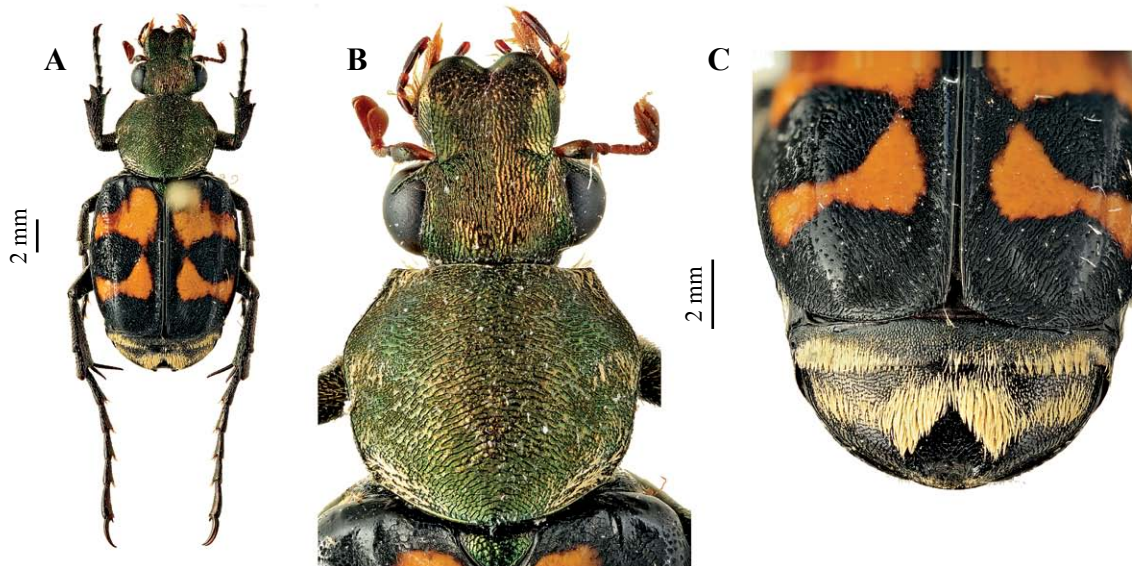


Fig. 3 – *Epitrichius jakli* Krajcik, 2012. HT♀ SJC: **A**, dorsal habitus. **B**, pronotum. **C**, pygidium. Picture by Jiri Hajek (NHMP).

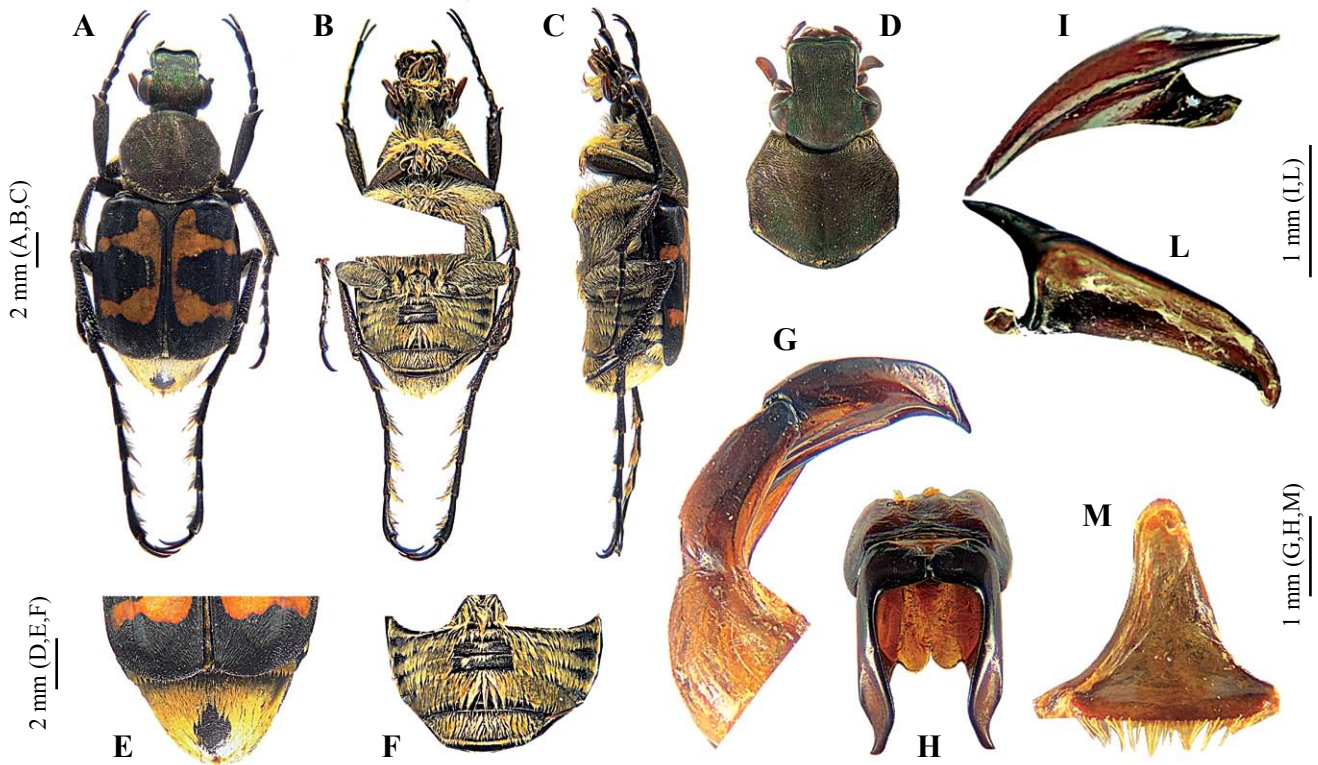


Fig. 4 – *Epitrichius bowringi* (J. Thomson, 1857) ♂ ERC from Kon Tum Province, Vietnam. **A**, dorsal habitus. **B**, ventral habitus. **C**, lateral habitus. **E**, pygidium. **F**, sternites: the central, glabrous square area is often absent in other males. **G**, parameres, in side view. **H** parameres, in dorsal view. **I**, internal sac major hook, frontal view. **L**, idem, in rear view. **M**, spiculum gastrale.

Elytra. Matt and glabrous. Disc nearly flat, carinae e-faced. Humbones joined by a rounded, noticeable carina; elytral apex and lateral sides rugose.

Ventriles and tergites. Black, completely covered by long, whitish setae, lying down and facing backwards.

Propygidium. Clothed with fringe of long, testaceous setae reaching basal margin.

Pygidium. Pygidial width nearly 1.35 times length medially; completely covered with long, testaceous setae but a glabrous, narrow, centrally extended longitudinal band not reaching base and apex.

Legs. Protibia with a single external tooth at apex. Meso- and mesotarsomeres setose at inner apex; the setae are long, testaceous, forming a tip.

Genitalia. Parameres symmetrical, directed downwardly, apex sharpened with a long, external, spine at apex.

Paratype female description (differences only). Length 17.3 mm; maximum elytral width 9.2 mm. The PT♀ differs from the HT♂ for being greater, with enlarged pygidium (large about 2.2 times its length at centre), for two sharp teeth at external margin of protibia and for pygidial apex hollowed centrally.

Diagnosis and type series variability. Size of males of the typical series: length 13.8–15.4 mm, maximum width 6.6 - 8.0 mm.



Fig. 5 – Distribution range of *Epitrichius* in southeast Laos, central and southern Vietnam. Inseted on Google Earth map. **A**, *Epitrichius australis* new species. **B**, *Epitrichius bowringi* (J. Thomson, 1857). **F**, *Epitrichius fraterculus* (Moser, 1901). **J**, locus typicus of *Epitrichius jakli* Krajcik, 2012.

It is very difficult to separate *E. australis* from *E. bowringi* «*E. jakli* like». Even if all legs are usually black in the latter species, black with metallic hue in *E. australis*, the only safe way to separate these two species is by the shape of their parameres.

Derivatio nominis. The new species takes its name from being the southernmost known species of the genus. *Australis* in Latin means «of the south».

***Epitrichius bowringi* (J. Thomson, 1857)**(Figs 3 and 4)
= *Epitrichius jakli* Krajcik, 2012 (**new junior synonym**)

Type series of *E. jakli*. HT ♀, SJC, Laos: Attapeu, Annam Highlands, Mts. Dong Amphan, NBCA, Nong Fa (Crater Lake) env., 1160 m, 20 Apr/6 May 2011, S. Jakl legit.

Other studied material. China: 2♀ NMER, Zhejiang, Gutianshan Natural Reserve (29°25'N, 118°14'E), 639 m, 2010. 1♂ ERC, Fujian, Shaowu env., 23/26 Jul 1991, E. Jendek & O. Sausa legit; 2♀ ERC, Guangxi, Mt. Dayaoshan, Linxiang, Jinxiu, 700 m, May 2013, Local Collectors; 2♂, 1♀ ERC, Guangxi, Mt. Dayaoshan, Gongcheng, 6/26 Jul 2001, Local Collectors; 1♀ ERC, Guizhou, 20 Km NW Jangkon, 23 May/3 Jun 1995, E. Jendek legit; 4♂ ERC, Hainan, Mt. Jangfeng, Sanya, 1/12 Jul 2004; 1♂, 1♀ ERC, Hunan, Guidong env. (26°04'N, 113°56'E), 26/31 May 1994, E. Jendek & O. Sausa legit; 5♂, 10♀ ERC, Jangxi, Jinggangshan-Ciping, 2/14 Jun 1994, E. Jendek & O. Sausa.

Laos: 223 ♂♀ ZFMK, 4♂♀ ERC, Hua Phan, Ban Saleui, Phou Pan Mts. (20°12'N, 104°01'E), 1300-1900 m, 11 Apr/15 May 2012, C. Holzschuh legit; 55♂, 22♀ ZFMK, 12♂, 7♀, same data but 1/31 May 2011; 30♂, 5♀ ZFMK, 1♀ ERC, same data but 7 Apr/25 May 2010; 3♂, 2♀ ERC, Oudomxai, Ban Namo (about 20°37'18" N, 101°57'25" E), 1/6 Jul 2004.

Northern Vietnam: 1♀ ERC, Vinh Phu, Tam Dao Nat. Park, 75 km NW Hanoi, 15 May/16 Jun 1991, E. Jendek legit; 2♂ ERC, Vinh Phu, Tam Dao, 4/7 Jul 1994, E. Jendek legit; 2♂ ERC, Vinh Phu, Tam Dao, 12/24 May 1989, Pacholatko legit; 2♂ ERC, Vinh Phu, Tam Dao, Jun 1993; 1♂, 1♀ ERC, Vinh Phu, Tam Dao, May 1994; 1♀ ERC, Vinh Phu, Tam Dao, May 1991, E. Jendek legit; 1♀ ERC, Vinh Phu, Tam Dao, Aug 1996; 1♀ ERC, Vinh Phu, Tam Dao, May 1991, E. Jendek legit.

Central Vietnam: 5♂, 4♀ ERC, Kon Tum, Ngoc Linh Mt., 1700 m, Apr 2016, Dang Ngoc Van legit; 1♀ ERC, Kon Tum, Ngoc Linh Mt., 1700 m, May 2016, Dang Ngoc Van legit.

Remarks

The peculiar wrinkled and shining pronotum and elytral pattern shared by *E. australis* and *E. bowringi* occur only in most of the specimens of the latter species inhabiting southeastern Laos and central Vietnam. This shared peculiarity should be further explored in order to verify if hybridization between the two species could occur.

Updated list of species of the genus *Epitrichius* recorded from Vietnam

Epitrichius bowringii (J. Thomson, 1857)
= *jakli* Krajcik, 2012
fraterculus (Moser, 1901)
australis new species
versutus (Krikken, 1972)

Vinh Phuc, Kon Tum
southeastern Laos
Vinh Phuc, Kon Tum
Dak Lak, Nha Trang, Da Lat
Cao Bang, Vinh Phuc, Ha Tinh

Key to species of the genus *Epitrichius*

(from Li et al., 2008, modified)

1. Anterior margin of clypeus distinctly raised, moderately to slightly emarginated medially, anterior margin sinuated in male, slightly bilobed in female, anterior corners rounded. Apex of pygidium of female with pair of longitudinal ridges or papillose tubercles 2
- Anterior margin of clypeus not raised, not emarginated medially, anterior corners protruding, anterior margin more or less deeply bilobed. Apex of pygidium of female unmodified 5
2. Dorsum usually overall shiny metallic green in males, metallic green or cupreous in female, female rarely blackish brown without metallic luster; basolateral angles of pronotum protruding basally. Pygidium with a pair of median tufts of testaceous bristles in both sexes. Taiwan
..... *elegans* (Kano, 1931)
- Head and pronotum dull green, cupreous or black; basolateral angles of pronotum superiorly rounded, inferiorly acute; pygidium lacking a pair of median tufts of bristles, covered with testaceous bristles with or without a small glabrous area centrally in males 3

3. Overall green in males, sometimes darker in females; males collected from northern Indochina and southernmost China usually with elytra black or dull green; head and pronotum with or without velutinous surface, more or less wrinkled; head glabrous, central disc of pronotum sparsely covered with bristles or nearly glabrous with distinct marginal bristles. Eastern and southern China, northern and central Vietnam, north-eastern Laos *bowringii* (J. Thomson, 1857)
- Head, pronotum (partly with copper red in females) and scutellum overall velutinous or shiny cupreous, with dense, short bristles and distinct wrinkled surface 4
4. Parameres with a showy, sharp, external tooth at apex (Fig. 1F). Pygidium of female centrally hollowed at apex, hollow with two paramedian protrusions (Figs 2 B-C). Southern Vietnam *australis* new species
- Parameres without a showy, sharp, external tooth at apex. Pygidium of female centrally hollowed at apex, hollow without two paramedian protrusions. Taiwan
..... *cupreipes* (Bourgoin, 1915)
5. Pronotum distinctly covered with bristles; mesometasternal process not visible when viewed laterally 6
- Pronotum glabrous or marginally setose; mesometasternal process visible when viewed laterally 7

6. Head, pronotum and scutellum with iridescent lustre; basolateral angle of pronotum distinctly produced; elytron with triple transverse markings; pygidium transversally setiferous with vaguely defined paired tufts in both sexes. Amami-Oshima Island, southwestern Japan *lagopus* (Fairmaire, 1897)
- Head, pronotum, scutellum and legs with copper red or green metallic lustre; basolateral angle of pronotum weakly produced; elytron with double transverse markings, diffused marginally and weakly defined; internal side of metatarsomere 1-2 densely covered with short, testaceous bristles. Northern Vietnan, southeastern Laos *versutus* (Moser, 1902)
7. Elytra reddish brown with transverse markings diffused marginally and weakly defined; internal side of metatarsomere 1-2 densely covered with long, dark testaceous, bristles. Taiwan *magnificus* Krajcik & Chou, 2008
- Elytra black with transverse markings not diffused marginally and well defined; internal side of metatarsomeres 1-2 sparsely or densely covered with short or long testaceous

bristles. Southern China, eastern Laos, northern and central Vietnam *fraterculus* (Moser, 1902)

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