Revision of the Anthaxia (Haplanthaxia) proteus species group
(Coleoptera: Buprestidae)

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Abstract. A revision of Anthaxia (Haplanthaxia) proteus species group from the East Palaearts. A. proteiformis sp. n., A. sichuanica sp. n. and A. huashanica sp. n. are described from China. New status is proposed for A. psitticina Heyden (A. proteus psitticina Heyden) A. ihanatumi Chůjů (A. moya ihanatumi Chůjů) and A. rubromaculata yunnana Bily (A. yunnana Bily). A new synonym (A. rubromarginata Miwa & Chůjů = A. egorovi Alexeev, syn. n.) is also proposed. All species are keyed and illustrated.

INTRODUCTION

The Anthaxia proteus species group comprises several species from the easternmost Palaeartic region, which were separated by Richter (1949) as the genus Cratomerella Richter. This genus was untenable when viewed against the background of world fauna, and was synonymised by Obenberger (1958) within the genus Anthaxia Eschscholtz.

The A. proteus species group belongs to the subgenus Haplanthaxia Reitter, 1911 within the genus Anthaxia (Bily, 1989), and has the following characteristics: small or very small species, with intense silky lustre caused by the very dense and fine microsculpture of the entire dorsal side of the body; widely rounded apical margin of the anal sternite not modified, female very often having a small, apical notch; legs long and slender, male meso- and metatibialae often serrate on the inner margin but always slender and straight; vertex extremely narrow, usually only 0.5–0.6 times as wide as width of eye; eyes very large but not projecting beyond the outline of the head; claws long and simple; aedeagus always serrate, parameres very often with conspicuous preapical spins or hooks; when there are black spots on the pronotum, the pronotal structure of these spots is indistinct and reduced usually only to basal microsculpture; elytra colored golden green to black, always with a distinct mirror-effect along the posterior part of the elytral suture; pronotum often with 1 or 2 black spots, or dark, not sharply limited fields.

The recent discovery of three new species from China initiated the present revision. A change in status for A. yunnana, A. proteus psitticina and A. moya ihanatumi has been proposed on the basis of only a few specimens. More specimens are needed to confirm their status definitively.

Key to the species of Anthaxia proteus species group

1(6) Frons and vertex convex
2(3) Lateral pronotal margins almost regularly rounded (Fig. 5); pronotal sculpture consisting of very dense but regular polygonal cells with large central grains; elytra widely rounded apically (Fig. 5); male greenish-black with green frons and pronotal margins; female black with bright orange pronotal margins; aedeagus (Fig. 10) spindle-shaped, parameres with 2 or 3 small preapical spines; 4.1–5.4 mm ........................................... A. rubromarginata Miwa & Chijó
3(2) Lateral pronotal margins enlarged anteriorly (Figs 3, 15), pronotal structure consisting of very fine microsculpture and indistinct small polygonal cells without distinct central grains; elytra very acuminate apically (Figs 3, 15); male golden green with blue tinge, pronotum often darkened medially; female black with green lustre, dark brown or rarely reddish-brown, usually with greenish posterior pronotal angles.
4(5) Pronotum conspicuously enlarged, almost angular in anterior half; frons highly convex; elytra more acuminate apically; anterior pronotal margin only slightly lobate (Fig. 15); head black, pronotum black with very slight green tinge on anterior and posterior margins; elytra reddish-brown with narrow basal and sutureal greenish stripes, ventral side black; 5.3 mm (male unknown) ........................................... A. angulaticollis Kuroswa
5(4) Pronotum slightly enlarged in anterior half; frons moderately convex; elytra less acuminate apically; anterior pronotal margin more lobate (Fig. 3); body golden green with blue tinge, disc of pronotum often darkened (male) or body black, brownish-green, usually with greenish posterior pronotal angles (female); ventral side greenish-black; aedeagus (Fig. 8) short and robust, parameres with conspicuous preapical hooks; 3.6–4.5 mm ......................... A. proteus Saunders
6(1) Frons and vertex flat or depressed.
7(8) Very small, subtriangular and bicolorous species; pronotum bright golden-orange, elytra golden green with blue tinge; maximum width of pronotum in posterior half (Fig. 16); aedeagus (Fig. 11) long and very slender, rather obtuse apically, parameres without hooks or spines; 3.5–4.5 mm ......................... A. moya Chijó
8(7) Longer, subparallel or robust species; pronotum and elytra concolorous or pronotum with more or less distinct black spots; maximum width of pronotum in anterior half (Figs 1, 2, 4, 14, 17); parameres with preapical spines or hooks (Figs 7, 9, 12, 13) or aedeagus robust, spindle-shaped but always pointed (Fig. 6); larger species.
9(10) Smaller and more robust, lustrous species with less developed microsculpture; body shape very similar to that of A. rubromarginata (except convex head) – Fig. 14; elytra with only very slight mirror-effect along the posterior part of elytral suture; posterior part of elytra regularly arched towards their apices; aedeagus (Fig. 13) rather slender, parameres only with small preapical spine; male golden with two indistinct brownish pronotal spots, female black with wide, orange pronotal margination; 4.2–5.2 mm ........................................... A. yunnana Bilý
10(9) Larger and slender species with intense silky lustre caused by very dense and fine microsculpture; elytra with distinct mirror-effect along the posterior part of elytral suture; lateral elytral margins straight or slightly incurved before apex (Figs 1, 2, 4, 17); aedeagus robust and spindle-shaped (Fig. 6) or parameres with conspicuous hooks (Figs 7, 9, 12); sexual dichromatism less developed (when both sexes are known).
11(14) Frons flat (Figs 1, 4); pronotum green or golden green with two distinct black spots.
12(13) Large, elongate and completely silky-green species (Fig. 1); pronotal sculpture homogenous, consisting of small polygonal cells with very small, indistinct central grains; elytra slender, 2.1 times as long as wide at humeral part; anal sternite of female without apical notch; aedeagus (Fig. 6) spindle-shaped, parameres without spines; no sexual dichromatism; 5.1–6.0 mm ........................................... A. proteiformis sp. n.
13(12) Smaller, more robust species (Fig. 4); male dark golden green with two black pronotal spots; female nearly black, pronotum green-orange with two large black spots very close to each other; lateral parts of pronotum with small, polygonal cells, black pronotal spots with fine microsculpture; elytra only 1.9 times as long as wide at humeral part; anal sternite of female with narrow and
deep notch apically; aedeagus (Fig. 9) robust, parameres with large preapical spines and with dorsal postmedial lobes; 4.0–5.3 mm .......................... A. alcmeneae Obenberger

14(11) Frons depressed; pronotum distinctly darkened on the disc or with large, black central spot.

15(16) Larger and more robust species; elytra sharply rounded apically, only 1.8 times as long as wide at humeral part (Fig. 2); pronotal sculpture homogeneous, consisting of small, polygonal cells with very small but distinct central grains; male with black-green pronotum with one large, black central spot; female black with purple lateral pronotal margins; anal sternite of female finely notched apically; aedeagus (Fig. 7) large and spindle-shaped, parameres with large preapical hooks; 5.5–6.2 mm .......................... A. sichuanica sp. n.

16(15) Smaller and slender species; elytra rather obtuse apically, 2.2 times as long as wide at humeral part (Fig. 17); pronotal sculpture consisting of small, polygonal cells without central grains; polygonal structure nearly indistinct on the disc of pronotum; male golden green or brownish-green with distinctly darkened pronotal disc; female unknown; aedeagus (Fig. 12) robust, enlarged apically, parameres with preapical hooks; entire aedeagus somewhat flattened dorsally; 5.0–5.9 mm .......................... A. huashanica sp. n.

Figs 1–5. 1 – Anthaxia (Haplanthaxia) protiformis sp. n., holotype, 5.2 mm; 2 – A. (Hapl.) sichuanica sp. n., holotype, 5.8 mm; 3 – A. (Hapl.) proteus Saunders, 4.1 mm; 4 – A. (Hapl.) alcmeneae Obenberger, 4.8 mm; 5 – A. (Hapl.) rubromarginata Miwa & Chøj, 4.2 mm.

Anthaxia (Haplanthaxia) proteus proteus Saunders, 1873
(Figs 3, 8)

Anthaxia proteus Saunders, 1873: 511.
Anthaxia proteus var. minuta Miwa & Choj, 1935: 275; (Kurosawa, 1948).
Anthaxia proteus var. matsunurae Miwa & Choj, 1935: 275; (Kurosawa, 1948).

This subspecies is widely distributed throughout Japan. I have also studied one specimen from Taiwan (Bily, 1989) and a few specimens from Tsushima. The latter differ from
Japanese specimens by their somewhat broader pronotum, but evidently belong to this subspecies. This subspecies does not occur in SE China, and I believe it was introduced to Taiwan.

**Host plant:** Probably *Pinus* spp.

**DISTRIBUTION:** All of Japan, Tsushima, Taiwan (?)

**MATERIAL STUDIED:** The holotype (♂), (BMNH) and 180 specimen from the entire range of the species.

*Anthaxia (Haplanthaxia) proteus psittacina* Heyden, 1887, stat. n.

*Anthaxia psittacina* Heyden, 1887: 303.

This subspecies was described from China (Su fun riv.) as a distinct species, but, having studied many specimens of *A. proteus* from the continent, I believe that it is only a subspecies of *A. proteus*. It differs from *A. proteus* only by a less enlarged pronotum in its anterior part and a more distinct pronotal sculpture. Male genitalia of both subspecies are fully identical.

**Host plant:** *Pinus* sp.

**DISTRIBUTION:** The Russian Far East, Korea, NE China.

**MATERIAL STUDIED:** The holotype (DEIC), 21 specimens from the Russian Far East (Amur, Voroshilov, Terkei, Tigrovyi), 16 specimens from Korea (Shinkoi, Chonagiin, Mt Solak) and 7 specimens from NE China (Manshukuo, Churbin).

*Anthaxia (Haplanthaxia) angulaticollis* Kurosa, 1956


This species was described from a single female labelled “Formosa, Hori, viii.1943, T. Shinohara leg.”. It is very closely related to *A. proteus*, from which it differs only by the greatly widened pronotum, more convex frons and more acuminate elytral apex (Fig. 15). Unfortunately, no male has been collected as yet.

**DISTRIBUTION:** Taiwan.

**MATERIAL STUDIED:** The holotype (NSMT).

*Anthaxia (Haplanthaxia) proteiformis* sp. n.

(Figs 1, 6)

Prolonged, subcylindrical, dark-green, matt species with intensive silky lustre (Fig. 1); pronotum and elytra hairless, frons with extremely short, microscopic pubescence, ventral side with very short and sparse pubescence; by its coloration and body shape it resembles a large male of *A. proteus*.

Head relatively small, frons flat, eyes large but not projecting beyond outline of the head; vertex very narrow, only 0.6 times as wide as width of eye; clypeus wide, deeply and regularly incurved anteriorly, separated from frons by large, transverse depression; frons with small, rounded depression on anterior half; eyes S-shaped, strongly converging towards vertex; antennae rather long, reaching posterior half of pronotum; antennal segments 4–11 rhomboid, slightly more long than wide; first antennal segment pear-shaped, as long as segments 2 and 3 together; sculpture of head consisting of small and dense, polygonal and oval cells with indistinct central grains and dense basal microsculpture.

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Pronotum subcordiform with large but shallow laterobasal depressions, 1.8 times as wide as long; maximum pronotal width in anterior third; lateral pronotal margins regularly rounded in anterior half, almost straight in posterior half and slightly incurved before posterior angles (Fig. 1); both anterior and posterior pronotal margins bisinuate; pronotal sculpture homogenous, consisting of small polygonal cells with very indistinct central grains and very fine, dense basal microsculpture. Scutellum flat, triangular as long as wide.

Elytra rather convex, subcylindrical, 2.1 times as long as wide at humeral part; humeral swellings small, basal, transverse depression rather shallow, not reaching scutellum; elytra narrowed at the level of hind coxae and slightly enlarged in posterior third (Fig. 1); apices regularly rounded and very finely serrate; epipleura not reaching apex; sculpture indistinct, consisting of dense basal microsculpture and small, lustrous grains, with distinct mirror-effect along the posterior third of suture.

Ventral side of prothorax finely ocellate, abdomen with the same sculpture as elytra, but somewhat more lustrous. Anal sternite regularly rounded, without lateral serration. Legs long and slender, protibiae bent inwards and slightly enlarged apically, meso- and metatibiae straight, slightly but distinctly serrate on apical third of inner margin. Claws simple, yellow-brown.

Aedeagus (Fig. 6) robust and spindle-shaped, apical part or parameres only slightly enlarged.

Female differs from male only by straight protibiae and simple meso- and metatibiae. No sexual dichromatism.

Length: 5.1–6.0 mm (holotype 5.2 mm); width: 1.7–2.2 mm (holotype 1.8 mm).


Allotype (♀): the same data (NMPC).

Paratypes (1♂, 3♀): the same data (NMPC, VKBC).

The specific name indicates the similarity with _A. proteus._

_A. proteiformis_ sp. n. differs from the most similar species, _A. proteus_, by its longer body, flat frons, different shape of lateral pronotal margins, absence of sexual dichromatism, markedly different shape of male genitalia and simple anal sternite in the female, which is deeply notched in female of _A. proteus_. It differs from other species of the _A. proteus_ species group by characters given in the key.

_Anthaxia (Haplanthaxia) alcmaeone_ Obenberger, 1938
(Figs 4, 9)

_Anthaxia alcmaeone_ Obenberger, 1938: 181–182.

Species without taxonomical problems, described from a single male from China (Kiuang, Tatsienlu).

Host plant: _Pinus yunnana._

**Distribution:** South China (Yunnan).

**Material studied:** The holotype (NMPC), 5♂♂, and 5♀♀ recently collected by V. Kubíš in Yunnan: Weishan Mt., 1,880–2,000 m, 22.–25.vi.1992 and Yulongshan Mts., 5,600 m, 7.–12.vii.1990.

Note: It is interesting that the male genitalia of _Anthaxia alcmaeone_ are very similar to those of _A. karasawai_ Bily from Taiwan, even though both species belong to quite different species groups of _Haplanthaxia._

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Figs 6–10. 6 – aedeagus of *Anthaxia* (*Haplanthaxia*) proteiformis sp. n., holotype; 7 – the same, *A. (Hapl.) sichuanica* sp. n., holotype; 8 – the same, *A. (Hapl.) proteus* proeas Saunders; 9 – the same, *A. (Hapl.) alcmaeone* Obenberger, holotype; 10 – the same, *A. (Hapl.) rubromarginata* Miwa & Chūjō.

*Anthaxia (Haplanthaxia) rubromarginata* Miwa & Chūjō, 1935  
(Figs 5, 10)

*Anthaxia primorjensis* Obenberger, 1938: 206–207; (Kurosawa, 1948).  

This species was described as a variety of *A. proteus* and later elevated by Kurosawa (1948). He has also synonymized *A. primorjensis* Obenberger as a junior synonym in the same paper. After having studied the female holotype of *A. egorovi* Alexeev, I consider *A. egorovi* Alexeev to be conspecific with *A. rubromarginata* Miwa & Chūjō and a junior synonym.

**Distribution:** Japan (except Hokkaido), Korea, the Russian Far East, E China.

**Material studied:** The holotypes of *A. primorjensis* (♀), (NMPC), *A. egorovi* (♂) (ZMAS) and 11 specimens from E China (Mukden), Korea (Riongaksan), the Russian Far East (Sokolch, Kraskino) and Japan (Kitamoto).
Anthaxia (Haplanthaxia) yunnana Bily, 1990, stat. n.  
(Figs 13, 14)


I described this species as a subspecies of A. rubromarginata (Bily, 1990) from three specimens from Yunnan. After having studied all the material of A. rubromarginata mentioned above, and the new material recently collected in Yunnan, I consider A. yunnana to be a distinct species. It differs from A. rubromarginata by flat frons, lustrous and less microsculptured body, different coloration of male, more attenuate and serrate elytral apex, different male genitalia and other characters given in the key.

Distribution: S China (Yunnan).

Material studied: All type specimens (2♂ 1♀) (NMPC) and 2♂ 3♀ labelled: China, Yunnan, Lijiang, 1,800 m, 23.vi–21.vii.1992, 26.53 N 100.18 E, E. Jendek leg.

Anthaxia (Haplanthaxia) sichuanica sp. n.  
(Figs 2, 7)

Rather large and robust species (Fig. 2); frons with indistinct microscopic white pubescence, pronotum and elytra hairless, ventral side with very short and sparse white pubescence; metepisterna and lateral depressions of the 1st abdominal sternite with a field of white toment; male: vertex and pronotal disc black, elytra black-green, lateral pronotal margins golden green, ventral side golden-orange; female: head and elytra black with metallic lustre, pronotal disc black, lateral pronotal margins and ventral side purple; elytra of both sexes with distinct mirror effect along the posterior part of elytral suture. 

Head relatively large, frons slightly depressed; eyes large but not projecting beyond outline of head, strongly converging towards vertex; vertex flat and very narrow, only 0.5 times as wide as width of eye; clypeus widely incurved anteriorly, separated from frons by wide and shallow depression; sculpture of head consisting of dense oval and polygonal cells with small central grains; antennae relatively short, reaching middle of lateral pronotal margins; antennal segments 4–11 rhomboid, as long as wide in male and slightly shorter in female; first antennal segment pear-shaped, slightly shorter than segments 2 and 3 together.

Pronotum wide and flat, 1.8 times as wide as long (Fig. 2), laterobasal pronotal depression wide and shallow; lateral pronotal margins almost regularly rounded, maximum width of pronotum in anterior third; both anterior and posterior pronotal margin slightly bicuspid; pronotal sculpture homogenous, consisting of small, polygonal cells with central grains and showing somewhat finer on the black part of pronotum than on the lateral golden green or purple margins. Scutellum rather large, flat and semicircular.

Elytra rather convex, 1.8. times as long as wide at humeral part; humeral swellings small, basal, transverse depressions rather shallow, not reaching scutellum; elytra distinctly narrowed at the level of hind coxae, lateral margins slightly serrate preapically (Fig. 2); tips regularly rounded, epipleura not reaching elytral apex; entire surface with microsculpture causing a silky lustre.

Ventral side with very fine reticulate structure, lustrous; anal sternite widely rounded, very finely serrate laterally and smooth apically. Hind coxae with sharp and projecting lateroposterior angle. Legs relatively long and slender, male protibiae bent inwards, meso-
and metatibiae straight, inner margin finely but distinctly serrate in apical half. Claws yellow-brown, simple, slightly enlarged at base.

Aedeagus (Fig. 7) long and spindle-shaped, parameres with large, preapical hooks.

Female differs from male by its coloration (see above), by simple tibiae and by apically notched anal sternite.

Length: 5.8 mm (holotype) and 6.7 mm (allotype); width: 2.2 mm (holotype) and 2.4 mm (allotype).

Allotype: (♀): The same data (NMPC).

The specific name is derived from the locality (Sichuan prov.).
A. sichuanica sp. n. is the largest species of the A. proteus species group and it resembles A. alcmæone in its body shape and coloration. It differs by having a larger body, depressed frons, pronotal shape, quite different male genitalia and other characters given in the key.

 Anthaxia (Hayplanthaxia) huashanica sp. n.  
(Figs. 12, 17)

Subcylindrical, convex, rather stout, and dorsally completely hairless species (Fig. 17) with intensive silky lustre; elytra and vertex brownish-golden green, frons blue-green, anterior and lateral pronotal margins golden green, underside lustrous, golden green with indistinct, microscopic white pubescence.

Head relatively small, eyes large, S-shaped, not projecting beyond outline of head; frons very narrow, flat, 0.6 times as wide as width of eye; frons slightly depressed (Fig. 17); clypeus rather long, slightly incurved anteriorly, separated from frons by a shallow, transverse depression; sculpture of head consisting of small polygonal cells with very indistinct central grains and basal microsculpture; antennae short, hardly reaching middle part of lateral pronotal margins; antennal segments 4–11 rhomboid, each as long as wide; first antennal segment pear-shaped, slightly shorter than segments 2 and 3 together.

Pronotum convex, 1.7 times as wide as long, with small and flat laterobasal depressions (Fig. 17); lateral pronotal margins almost regularly rounded, maximum width of pronotum in anterior third; anterior and posterior pronotal margins slightly bisinuose; pronotal sculpture consisting of dense basal microsculpture and small polygonal cells without central grains; only several cells at hind pronotal corners bear small, indistinct, reticulate sculpture. Scutellum subtriangular, flat.

Elytra convex, subcylindrical, rather stout and conspicuously obtuse apically, 2.2 times as long as wide at humeral part (Fig. 17); elytra slightly narrowed at the level of hind coxae; epipleura well-developed but not reaching apex; basal, transverse depression shallow but nearly reaching scutellum; humeral swellings small; elytra with silky lustre and dense, nearly homogenous microsculpture, which is somewhat denser along lateral margins; there is a well-developed mirror effect along the posterior half of suture.

Ventral side lustrous, prothorax with rather rough, abdomen with fine, reticulate sculpture. Hind coxae with sharp lateroposterior angle, meso- and metafemora with rather long, white pubescence on the inner part of their posterior margins. Legs rather long and slender, protibiae slightly bent inwards, meso- and metatibiae finely and densely serrate on
Figs 11–17. 11 – aedeagus of *Anthaxia (Haplanthaxia) moyya* Chůjč; 12 – the same, *A. (Hapl.) huashanica* sp. n., holotype; 13 – the same, *A. (Hapl.) yunnana* Bílý, holotype; 14 – *A. (Hapl.) yunnana* Bílý, holotype, 4.2 mm; 15 – *A. (Hapl.) angulaticollis* Karosawa, holotype, 5.3 mm; 16 – *A. (Hapl.) moyya* moyya Chůjč, 3.7 mm; 17 – *A. (Hapl.) huashanica* sp. n., holotype, 5.5 mm.
apical half of their inner margins. Claws brown, simple, very slightly enlarged at base. Anal sternite very slightly bisinuous apically and finely serrate laterally.

Aedeagus (Fig. 12) rather robust and enlarged in apical fourth, slightly flattened dorsally, parameres with large preapical hooks.

Female unknown.

Length: 5.5–5.8 mm (holotype 5.5 mm); width: 1.9–2.1 mm (holotype 1.9).

Paratypes (3♂ 3♀): The same data (NMPC, VKBC).

The specific name is derived from the locality (Hua Shan Mts.).

Anthaxia huashanica sp. n. resembles dark specimens of A. proteiformis by its coloration and intense silky lustre. It differs, of course, from A. proteiformis by its depressed frons, different pronotal shape and structure, form of male genitalia and other characters given in the key, especially its obtuse, widely rounded elytral apex, which is quite uncommon to this group differentiating it from other species of A. proteus species group.

Anthaxia (Haplanthaxia) moya Chûjô, 1970
(Figs 11, 16)


This smallest species of the A. proteus species group was described from two males (NSMT). This subspecies seems to be endemic to several small islands in the Ryukyu Archipelago, and it bears some common features with the A. aeneocuprea Kerr. species group (for instance, long, lancet-shaped and apically obtuse aedeagus with not enlarged parameres – Fig. 11). Other characters are common to the A. proteus species group (silky lustre from dense microsculpture, pronotal sculpture, absence of pubescence, shape of prosternal process, etc.), and there is no doubt that it should be included in this species group.

**DISTRIBUTION:** The Ryukyus (Is. Ishigaki, Is. Iriomote).

**MATERIAL STUDIED:** Two males a female from Iriomote.

Anthaxia (Haplanthaxia) moya ihanatumi Chûjô, 1970, stat. n.


Described after one female (holotype) and two males (NSMT). After having examined the original description (Chûjô, 1970), one paratype and one female, I am inclined to believe that this species is only a subspecies of A. moya. In fact, it differs from A. moya only by its bluer elytra, oranger pronotum and somewhat larger body. Of course, more specimens are needed to settle this question definitively.

**DISTRIBUTION:** The Ryukyus (Is. Okinawa).

**MATERIAL STUDIED:** One paratype and one female from Okinawa.

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