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A review of the genus *Anthocomus* Erichson, 1840 (Coleoptera, Cleroidea, Malachiidae) species of Inner Asia

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Abstract

The distribution and species diversity of the genus *Anthocomus* Erichson, 1840 of Inner Asia are discussed. Nine species, *Anthocomus (Celidus) equestris* (Fabricius, 1781), *Anthocomus (Anthocomus) abdominalis* Pic, 1903, *A.(A.) coreanus* Pic, 1911, *A. (A.) cyaneipennis* Wittmer, 1940, *A. (A.) limbellus* (Wittmer, 1953), *A. (A.) lineatipennis* Wittmer, 1995, *A. (A.) mongolicus* Wittmer, 1969, *A. (A.) similicornis* Wittmer, 1999 and *A. (A.) testaceoterminalis* Wittmer, 1995 known from the region and adjacent territories are reviewed. The placement of four species, *? A. (A.) coreanus* Pic, 1911, *? A. (A.) cyaneipennis* Wittmer, 1940, *? A. (A.) limbellus* (Wittmer, 1953) and *? A. (A.) mongolicus* Wittmer, 1969 in the genus *Anthocomus* Erichson is discussed as doubtful. A new species, *Anthocomus (Anthocomus) kovali* Tshernyshev, **sp. n.** from Wexi mountains, Yunnan Province, China is described and illustrated. The new species differs in its monochromous orange-yellow elytra with orange-red apical impressions yellow within, appendages orange-brown, head, pronotum, scutellum and palpi dark brown to black and lacking metallic luster, antennae dark brown.

Key words: Malachiini, *Anthocomus*, taxonomy, new species, Inner Asia

Introduction

The genus *Anthocomus* Erichson, 1840 is a typical representative of the tribe Malachiini (Tshernyshev 1998, 2000, 2011) which includes small to moderate size beetles (2.5–4.5 mm) with an elongate and sub-parallel body evenly expanded posteriorly, thin and simple antennae and legs, a body colour of black or black with metallic luster, and colour of elytra uniformly black, red or pale yellow, or orange-red with triangular spots or fasciae. Distinctive characters of the genus are as follows: antennae simple, with 11 antennomeres, serrate, simple, pronotum subquadrate with rounded angles, slightly impressed near posterior angles, mat, shagreen with fine punctures; elytra impressed at apices in male, impressions deep and possessing two spicular or lamellate appendages; legs thin, slightly elongate, simple, or posterior tibia in male with indentation in middle, all legs with 5 tarsomeres, simple, male anterior tarsi lacking comb above second segment.

Currently the genus *Anthocomus* Erichson, 1840 is represented by three subgenera, *Anthocomus (Anthocomus)* Erichson, 1840, *A. (Celidus)* Mulsant & Rey, 1867 and *Anthocomus (Omphalius)* Abeille de Perrin, 1891 (Mayor 2004, 2007); the differential characters of the subgenera are provided in the present paper in the key below.

Most of the *Anthocomus* Erichson species with red coloured elytra are common in Europe and can often be found on flowers in forest clearings and parks, or on transport and room windows in towns and cities. The diversity of European species is well studied (Mayor 2007), while Asian species are listed in the Palaearctic Catalogue as 'Incertae sedis', and very poorly known. That is why species occurring in the region of North and Inner Asia are studied and discussed in the present paper.

Inner Asia refers to landlocked regions within East Asia and North Asia that are part of today's Western China, Mongolia and Russian Far East and Siberia. This is a territory of different landscapes, from forest-taiga to forest-steppe, steppe and deserts, located in basins of great rivers and mountain synclines. Forests are also found in mountains at altitudes 1500–2000 m Above Sea Level (a.s.l.), presenting good places for *Anthocomus* Erichson

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species distribution. *A. (A.) abdominalis* Pic, 1903, *A. (A.) cyaneipennis* Wittmer, 1940, *A. (A.) limbellus* (Wittmer, 1953), *A. (A.) lineatipennis* Wittmer, 1995, *A. (A.) similicornis* Wittmer, 1999, *A. (A.) testaceoterminalis* Wittmer, 1995 and *Anthocomus (Anthocomus) kovali* Tshernyshev, **sp. n.** are described from mountains of China.

Only three species of *Anthocomus* Erichson, *A. (A.) coreanus* Pic, 1911, *A. (A.) mongolicus* Wittmer, 1969 and *A. (Celidus) equestris* (Fabricius, 1781) (Tshernyshev 2012b) have been recorded from neighbouring North Asia, a vast territory in the Asian part of Russia considered as a subregion of Eurasia and limited by the Uralskii, Sibirskii and Dalnevostochnyi (Far-Eastern) federal okrugs (districts). The diversity and distribution of beetles in the families Byrrhidae, Dasytidae, Malachiidae, Meloidae, Melyridae and Oedemeridae in the region were recently reviewed (Tshernyshev 2012 a,b, 2013, 2017 a–c).

Currently, 10 species of the genus *Anthocomus* Erichson are recorded from Inner Asia and adjacent territories including North Asia. All these species are reviewed and discussed below and include four species provisionally attributed to this genus which should probably be transferred to other genera after a review of the types.

Material and methods

Malachiidae beetles are considered here as a family (Majer, 1984, 1994, 2002; Mayor, 2004, 2007; Bocakova *et al*., 2012). A new system, based on a cladistic study of several species from different Cleroidea families, resulted in the Malachiidae being assigned to a subfamily to the Melyridae sensu nova (Gimmel *et al*., 2019). To build a non-conflicting and exact system, further study of all representatives of the family to include the determination of typical molecular characteristics comparable for phylogenetic analysis is required.

For descriptions, special male structures and genitalia were studied. The term "special male structures" is not analogue to the term "Excitatoren", that mean different kind of structures located in different part of male body of soft winged flower beetles and bearing ducts of pheromone glands necessary for female attraction and successful copulation (Evers 1956, 1963, 1988; Matthes 1962). The "special male structures" includes all typical parts of male irrespective of providing they with pheromone glands or not.

Illustrations for *Anthocomus (Anthocomus) kovali* Tshernyshev, **sp. n.** are from the holotype collected from Wexi, Yunnan Province of China.

Terminology of terminalia morphology is according to Lawrence *et al*. (2010), namely (in comparison with previously used terms): pygidium for apical tergite, ultimate abdominal ventrite for apical sternite, and endophallus for inner sac of the aedeagus.

'Special male structures' here refer to the elytra impressed at apices in male, with spicular or lamellate appendages, and posterior tibia in male with indentation in middle in reference to *Anthocomus (Celidus)* Mulsant & Rey.

The beetles were studied using an Amscope trinocular stereomicroscope (Ultimate Trinocular Zoom Microscope 6.7X-90X Model ZM-2TY), and digital photographs were taken using a Carl Zeiss Stemi 2000 trinocular microscope and the AxioVision programme. Male genitalia, embedded in DMHF (Dimethyl hydantoin formaldehyde), were mounted onto a transparent card and pinned under the specimen. Type material has been deposited in the collection of the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.

Results

Taxonomic review of the genus *Anthocomus* Erichson of Inner Asia

The genus *Anthocomus* Erichson, 1840 is a typical representative of the tribe Malachiini with external appearance of elongate and sub-parallel body evenly expanded posteriorly, thin antennae and legs. Similar characresitics were given by Erichson in its original description, but a group of beetles with a similar body shape were divided into three sections. The first section included beetles with simple anterior tarsi lacking comb above 2nd tarsomere, and impressed elytral apices in the male: "I. Fühler und Vorderfüsse bei beiden Geschlechlern einfach. Die Flügeldecken beim Männchen an der Spitze eingedrückt (*A. sanguinolentus, A. equestris, A. fasciatus, A. otiosus*)" (Erichson, 1840: 97–99). The second section included beetles possessing flabellate antennae, impressed apices of elytra in the male, and provided with comb above 2nd tarsomere in anterior legs: "II. Die Fühler beim Männchen gekämmt, beim

Weibchen gesägt, die Flügeldecken beim Männchen ander Spitze eingedrückt, die Vorderfüsse beim Männchen mit einem Fortsatz am zweiten G1iede, der die beiden folgenden Glieder bedeckt. (*A. cardiacae*)" (Erichson 1840: 100), currently assigned to the genus *Nepachys*. The third section of beetles had differential special male characters as simple antennae and elytra, and a comb above 2nd tarsomere in anterior legs; this section included two groups, one with an elongate pronotum: "III. Fühler und FIügeldeckenspitze bei beiden Geschlechtern einfach. Das zweite Glied der Verderfüsse beim Männchen mit einem Fortsatz, unter welchem sich die beiden nächstfolgenden Glieder befinden. *Das Halsschild länglich, oder wenigstens so lang als breit (*A. lateralis, A. iocosus, A. aemulus, A. sericans, A. parietariae, A. lobatus, A. coarctatus, A. constricius, A. ulicis, A. amictus, A. analis, A. labilis, A. pallidulus*)" (Erichson 1840: 101–107) now included in the genus *Attalus,* and the other with a transverse pronotum: "** Das Halsschild kürzer als breit, an den Seiten und hinten gleich mässig gerundet (*A. circumscriptus, A. atripennis, A. terminalis, A. stigma, A. scincetus Say, A. byssinus, A. melanoplerus, A. basalis, A. dimidiatus, A. scurra, A. calcitrans, A. laticollis, A. granularis, A. seminulum, A. minimus*)" (Erichson's 1840: 107–113) now included in the genus *Attalus*.

Obviously, these sections presented several different genera provisionally included in *Anthocomus* Erichson. Subsequently, Thomson (1859: 112) proposed *Cantharis fasciatus* Linnaeus, 1758 as type species of *Anthocomus* Erichson: "*Anthocomus* Er. *Malachius* Gyll. Typus *A. fasciatus* (Lin.): Gyll. I. 360. 5. Antennae submonililormes. Tarsi antici in utroque sexu simplices". Ultimately, only the species of Erichson's section I were regarded as belonging in the genus *Anthocomus* Erichson.

One of the species included in Erichon's "group 1", *A. otiosus* (Say, 1828) was transferred to *Attalus* Erichson (LeConte 1866), and three remaining species possessed variable colouration and size that allowed them to be attributed to different groups. Having overlooked the publication by Thomson (1859), Mulsant and Rey (1867) proposed a new subgenus *A. (Celidus)* Mulsant & Rey, 1867 for two small species with monochromous dark pronotum and fasciate elytra, *A. equestris* (Fabricius) and *A. fasciatus* (Linnaeus), designating *Malachius sanguinolentus* Fabricius, 1787 (a junior synonym of *Cantharis coccinea* Schaller, 1783) as a type species of the genus *Anthocomus* Erichson. This mistake was resolved by Mayor (2004) who described the taxonomic changes in *Anthocomus* Erichson, designating *A. equestris* (Fabricius) as type species of the subgenus *A. (Celidus)* Mulsant & Rey and proposing a new synonymy. Before a type species of *A. (Celidus)* Mulsant & Rey was designated, Abeille de Perrin (1891) proposed three subgenera *Anthocomus* Erichson with *A. sanguinolentus* Fabricius as the type species of the nominative subgenus (since Thomson's designation of *A. fasciatus* (Linaeus) as the type species had not been considered), namely: *A. (Neotrotus)* Abeille de Perrin, 1891, *A. (Parembalus)* Abeille de Perrin, 1891 and *A. (Omphalius)* Abeille de Perrin, 1891 with the following diagnoses: posterior tibiae in male flattened and sharp, elytra monochromously red—*Anthocomus (Anthocomus)* Erichson; posterior tibiae in male with flexture in middle, background colouration of elytra always red—*A. (Neotrotus)* Abeille de Perrin; posterior tibiae in male simple, not sharp, slightly curved outwards, elytral apices simple or impressed, lower side of the impressions flat, not curved, colour variable, never unicolorous—*A. (Parembalus)* Abeille de Perrin; colouration black with green metallic lustre, only elytral apices orange-red, in male lower margin of elytral impression strongly curved upwards and connected in middle with the upper margin—*A. (Omphalius)* Abeille de Perrin.

A doubtful situation occurred with *A. (Celidus)* Mulsant & Rey being ignored by Abeille de Perrin (1891) on the basis that both species of the subgenus, *A. bipunctatus* (Harrer, 1784) (= *A. equestris* (Fabricius, 1781)) and *A. fasciatus* (Linaeus) are type species of different generic groups: "M. Rey, opérant sur nos espèces de France, avait séparé les *bipunctatus* et *fasciatus* du *sanguinolentus* et avait formé son genre *Celidus*, basé, comme son nom l'indique, sur la coloration variée des étuis. J'aurais voulu conserver ce nom ; mais à quoi l'appliquer, puisque les deux espèces qui le composent servent de types à deux groupes différents?" (Abeille de Perrin, 1891: 187). If *A. bipunctatus* (Harrer) was included in the subgenus *A. (Neotrotus)* Abeille de Perrin and could be regarded as type species, *A. fasciatus* (Linaeus) was not mentioned in any of the designated subgenera.

This confusing situation was solved by Mayor (2004) who revised the subgenera of *Anthocomus* Erichson and synonymized *Anthocomus (Paremballus)* Abeille de Perrin with the nominative subgenus, and *Anthocomus (Neotrotus)* Abeille de Perrin with *A. (Celidus)* Mulsant & Rey. In fact, he designated *A. fasciatus* (Linaeus) as the type species of *Anthocomus (Paremballus)* Abeille de Perrin and *A. equestris* (Fabricius) as the type species of *A. (Celidus)* Mulsant & Rey, while *A. bipunctatus* (Harrer) (a junior synonym of *A. equestris* (Fabricius)) was designated earlier by Negrache, Hernandez (1990) as the type species of *A. (Neotrotus)* Abeille de Perrin. The revised taxonomic structure is based on morphological differences of male special characters. As regards the

taxonomic scheme proposed by Abeille de Perrin (1891), species lacking impressions in elytral apices in the male are also considered as members of *Anthocomus* Erichson, and provided this definition when describing subgenus *Omphalius*: "Il convient de remarquer que trois de ces espèces ont une terminaison des élytres anormale. Les *A. bicinctus* et *dux* les ont simples chez le mâle ; l'absence ou la présence d'une plicature apicale chez les mâles se retrouvant souvent dans un même genre *(Malachius, Cyrtosus, Attalus)*, je me contente de l'indiquer. *A. haeres* est beaucoup plus extraordinaire: ses élytres sont terminés par un appendice large, en oreille relevée, rappelant celui des Ebaeus ♂. J'ai formé pour lui le sous-genre *Omphalius*" (Abeille de Perrin 1891: 187). The absence of conservative characters to differentiate the genus *Anthocomus* Erichson makes subgeneric division by Abeille de Perrin artificial (see Mayor 2004).

Currently the genus *Anthocomus* Erichson, 1840 is represented by three subgenera, *Anthocomus (Anthocomus)* Erichson, 1840—type species *Cantharis fasciatus* Linnaeus, 1758, *A. (Celidus)* Mulsant & Rey, 1867—type species *Malachius equestris* Fabricius, 1781, and *Anthocomus (Omphalius)* Abeille de Perrin, 1891—type species *Malachius haeres* Abeille de Perrin, 1883 (Mayor 2004, 2007). Differential characters of the subgenera are given in the key below.

Subgeneric division of the genus *Anthocomus* Erichson, probably, needs further revision. The subgenus *Anthocomus (Omphalius)* Abeille de Perrin is monotypic and represented by atypical small beetles (2.5 mm) uniformly black with green metallic luster and orange-red elytral apices. Attribution of *A. thalassinus* (Abeille de Perrin, 1883) (Mayor 2007) to this subgenus is questionable. Apparently, members are more similar to *Anthomalachius* Tshernyshev, 2009 than *Anthocomus* Erichson, and could probably be considered as a good genus. The subgenus *A. (Celidus)* Mulsant & Rey also differs by the modified hind tibiae of males, that could be considered as a good character of the generic level, such as *Sceloattalus* Wittmer, 1966 of the tribe Attalini or *Sceloebaeus* Tshernyshev, 2015 and *Scelomixis* Wittmer, 1966 of the tribe Ebaeini. Švihla (1996) proposed a generic status for *Celidus* Mulsant & Rey on the basis of this distinctive character in the male; probably the author was right in this decision, but the lack of other differential characters impedes support for this taxonomic status. In the tribe Malachiini subgeneric division is often based on strong morphological characters; compare, for example, *Malachius (Malachius)* Fabricius, 1775 which possesses a depression in the head, and *Malachius (Protomalachius)* Evers, 1985 which lack this, or *Clanoptilus (Clanoptilus)* Motschulsky, 1854 which differs in its strongly impressed elytral apices bearing a spicular appendage inside and *Clanoptilus (Hypoptilus)* Mulsant & Rey, 1867 with weak impression and lacking appendage. Thus, the subgeneric division in *Anthocomus* Erichson awaits further revision. The subgenus *Anthocomus (Omphalius)* Abeille de Perrin should be renamed due to homonymy, and here this name is just provisionally used before new data will be published by colleagues.

Anthocomus Erichson, 1840

Anthocomus Erichson, 1840: 97, type species *Cantharis fasciata* Linnaeus, 1758 fixed by Thomson, 1859: 112;
= *Anthocomus (Paremballus)* Abeille de Perrin, 1891: 187; type species *Anthocomus fenestratus* Linder,1864 fixed and synonymized by Mayor (2004: 88);
Anthocomus (*Celidus*) Mulsant & Rey, 1867: 131, 135, type species *Malachius equestris* Fabricius, 1781, designated by Mayor (2004: 89); = *Anthocomus (Neotrotus)* Abeille de Perrin, 1891: 187; type species *Malachius bipunctatus* Harrer, 1784 (junior synonym of *Malachius equestris* Fabricius, 1781) designated by Negrache & Hernandez (1990: 284);
Anthocomus (Omphalius) Abeille de Perrin, 1891: 187; type species *Malachius haeres* Abeille de Perrin, 1883 fixed by monotypy.

Diagnosis. Small or moderate-size beetles (c. 2.5–4.5 mm) with elongate and sub-parallel body evenly expanded posteriorly, various colouration, from black to a combination of red and black with metallic lustre. Head simple, eyes small, round; antennae 11-segmented, serrate, simple, 2nd antennomere clearly visible, oval or triangular, 1.3 times as short as the 3rd antennomere; palpi simple, slightly elongate, apical palpomere conic, disk of head flat, finely punctured, mat, shagreen, pronotum subquadrate with rounded angles, slightly impressed near posterior angles, mat, shagreen with fine punctation; elytra subparallel, slightly expanded posteriorly in females, and impressed at apices in male, impressions deep and possessing two spicular or lamellate appendages. Wings well developed in both sexes. Legs thin, slightly elongate, simple, or posterior tibia in male with indentation in middle, all tarsi 5-segmented, simple, anterior tarsi lacking comb above 2nd segment. Pygidium (apical tergite) elongate, evenly narrower and rounded apically, 8th ultimate abdominal ventrite (apical tergite) narrow, transverse, hollowed in middle, tegment

with short base and thin elongate parameres, aedeagus of Malachiinae-type, simple, straight or somewhat curved dorsally, with round apex and short pointed lamella, one or two long spines visible in inner sac of the aedeagus.

Distribution. Species of the genus are widely distributed in Eurasia from Europe to the Far East, occurring mainly in forest or forest-steppe zones.

Key to subgenera of *Antocomus* Erichson, 1840

1. Small to moderate size beetles (c. 2.5–4.5 mm) with different coloured elytra, from monochromously red or black to orange-red or pale yellow with black spots or stripes, posterior tibia of male simple, lacking flexure in middle 2
- Small size beetles (about 3.0–3.5 mm) with typical orange-red elytra with black triangular spots or fasciae, posterior tibia of male with flexure in middle . . . . ***Anthocomus* (*Celidus*)** Mulsant & Rey, 1867 (Europe, Caucasus, Russia from European part throughout forest zone to West and East Siberia and the Russian Far East)
2. Small beetles (c. 2.5 mm) monochromously black with green metallic luster, apices of elytra orange-red, in male lower margin of elytral impression strongly curved upwards and connected in middle with the upper margin, one spicular appendage located inside the impression . . . . . ***Anthocomus (Omphalius)*** Abeille de Perrin, 1891 (Greece)
- Moderate size beetles (c. 3.5–4.5 mm) with different coloured elytra, elytral apices impressed, lower side of the impressions flat, not curved, possessing two spicular or lamellate shape appendages, located one inside the impression near suture, the other one closer to outer margin of the impression . . ***Anthocomus (Anthocomus)*** Erichson, 1840 (Europe, Caucasus, Russia from European Part to East Siberia, China, ? Korea, ? Mongolia)

List of species in the Genus *Anthocomus* Erichson of Inner (North-East) Asia

1. *A. (Anthocomus) abdominalis* Pic, 1903 (China: Shanghai).
2. *? A. (A.) coreanus* Pic, 1911 (Korea).
3. *? A. (A.) cyaneipennis* Wittmer, 1940 (China, Shanghai: "Zô-Sè" (Sheshan)).
4. *A. (A.) kovali* Tshernyshev, **sp.n.** (China, Yunnan: Wexi).
5. *? A. (A.) limbellus* (Wittmer, 1953) (China, Shanxi: Yangchang).
6. *A. (A.) lineatipennis* Wittmer, 1995 (China, Yunnan: Yulong).
7. *? A. (A.) mongolicus* Wittmer, 1969 (Mongolia, Dornogov (East Gobi) Aimak: Sainshand).
8. *A. (A.) similicornis* Wittmer, 1999 (China, Yunnan: Hengduan Meili).
9. *A. (A.) testaceoterminalis* Wittmer, 1995 (China: Yunnan: Jizu).
10. *A. (Celidus) equestris* (Fabricius, 1781) (Central and Southern Europe and Caucasus: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Finland, Germany, Greece, Italy, Poland, Romania, Russia, Spain, Sweden, Switzerland; North America: USA and Canada).

Anthocomus (Anthocomus) abdominalis Pic, 1903

Anthocomus abdominalis Pic, 1903: 106 ("Chine Chang-Haï"); Wittmer 1940: 101, 104; 1995: 374;
Anthocomus (Paremballus) abdominalis: Evers 1949 (1945–48): 59–60;
Anthocomus (Anthocomus) abdominalis: Mayor 2007: 438.

Remarks. This species was described from female possessing a distinctive colouration, red-brown abdomen. According to the monochromous dark coloured upperside, the species belongs to a group of black-coloured *Anthocomus*. Main typical characters of the species are: legs uniformly black, head, pronotum and elytra black with strong blue metallic luster, palpae dark brown, impression in elytral apices of male red inside. Original description by Pic (1903: 106) is as follows: "***Anthocomus*** (? ***Paremballus) abdominalis*** ♀. Allongé, alutacé sur l'avant-corps, un peu brillant sur les élytres, orne d'une fine pubescence couchée grise, avec quelques poils obscurs soulevés, ceux-ci courts; insecte bleuâtre avec l'abdomen rougeâtre; prerniers articles des antennes en dessous et genoux maculés de testacé, poitrine verte et métaIlique; tête impressionnée entre les antennes, celles-ci assez robustes, subdentées, à 3^{e} article un peu plus long que 4^{e}, 4^{e} plus large que 5^{e}, dernier allongé ; prothorax presque droit sur les côtés, un peu plus étroit que les élytres qui sont très longs, subtronqués au sommet ; tibias postérieurs longs, arqués, peu épais. Long. 4–5 mill. Chine : Chang-Haï. Reçu de M. A. Théry.—Espèce bien distincte par sa forme longue jointe à sa coloration".

Evers (1949) studied a batch of beetles (including 15 ♂♂ and 4 ♀♀) collected in April of 1937 and 1938 by J. Klapperich and H. Höne in Shanghai and "Kuatun, Fukuen Province of China". Kuatun is situated c. 130 km northwest of Shaowu, at an elevation of c. 2000 m, in the midst of wooded hills (Stefen & Fieler 2004), now Guadun town, Fujian Province, Republic of China (Yang *et al*. 2014). These specimens resembled Pic's diagnosis of *A. abdominalis* and all had a red abdomen. The male, described and special characters discussed by Evers (1949), is true *Anthocomus* Erichson belonging to the group of black-coloured species.

Distribution. The species was collected from Southeast China, near Shanghai (31°13′N; 121°28′E) and Guadun (27°40′N; 117°40′E).

? Anthocomus (Anthocomus) coreanus Pic, 1911

Anthocomus coreanus Pic, 1911: 107 ("Corée");
Anthocomus (Anthocomus) coreanus: Mayor 2004: 89, 2007: 439.

Remarks. The species was described from an unique specimen with no indication of sex. Since a loan of the type specimen from Paris Museum is impossible, is necessary to understand the original description in detail: "*Anthocomus coreanus* **n. sp.** Peu allongé, un peu brillant, pubescent de gris, d'un noir plombé avec le devant de la tête, les côtés du prothorax et des élytres, le sommet de ces derniers organes testacés ou rougeâtres, membres bicolores. Antennes fortes, foncées, plus ou moins testacées à la base; prothorax presque carré, faiblement arrondi sur les côtés et bordé assez étroitement de clair; élytres un peu plus larges que le prothorax, simples au sommet, bordés latéralement de clair, plus largement vers les épaules, sauf à l'extrémité avec une petite macule apicale et suturale rougeâtre; pattes presque entièrement-foncées, ainsi que le dessous du corps. Long. près de 4 mill. Corée (coll. Pic)" (Pic 1903: 106). This text can be interpreted as follows: "Head, pronotum and elytra leady-black lacking metallic luster, distal part of head, sides of pronotum and elytra and palps in part pale yellow, yellow margin of elytra widened near the base of elytra, elytral apices with red spot near suture; pronotum subquadrate with rounded lateral sides, antennae wide and dark, with yellow base; elytra slightly wider than pronotum, simple, not impressed or appendiculate at apices; legs almost completely dark, underside dark, length 4 mm. Corea (coll. Pic)".

This description presents a remarkable species, the characters of which to not fit those of the genus reviewed here. Wide antennae (Antennes fortes) show that this is probably a male; if so, another character, simple apices of elytra provide further evidence that this is not *Antocomus* Erichson. The yellow colour of the sides of the pronotum and elytra in combination with a lead-black colouration are comparable with *Haplomalachius* (*Flabellomalachius*) *forticornis* Wittmer, 1984 and *Haplomalachius* (*Flabellomalachius*) *ishiharai* Satô, Wittmer, 1989 subspecies *H.* (*F.*) *ishiharai kasantsevi* Wittmer, 1996, but the synonymy of these species can only be proposed after a comparison with type material. Nevertheless, in view of the facts discussed above, this species temporary remains in the key to *Anthocomus* Erichson of Asia as questionable.

Distribution. To date, this species is only known from the description with an ambiguous locality name "Corea" as terra typica.

? Anthocomus (Anthocomus) cyaneipennis Wittmer, 1940

Anthocomus (*Ebaeus*?) *cyaneipennis* Wittmer, 1940: 100–101, 103–104 (China "Zô-Sè");
Anthocomus cyaneipennis: Wittmer 1941: 1126;
Anthocomus (incertae sedis) *cyaneipennis*: Mayor 2007: 439.

Remarks. This species was described from a female with no exact generic definition as *Anthocomus* Erichson or *Ebaeus* Erichson. The remarkable blue-black colouration places this species to a group of black *Anthocomus*-species, or to *Ebaeus transbaikalicus* Pic, 1912, but the attribution of this species to the genus *Anthocomus* Erichson remains questionable. The main differential characters are obvious from the original description as follows: Legs dark brown to black with yellow tibiae and tarsi, and comissure femora and tibiae in anterior legs; head and pronotum lacking metallic luster, elytra black with violet metallic luster, palpi yellow with black apical palpomere.

The original text of the description is: "***Anthocomus (Ebaeus ?) cyarieipennis* nov. spec.** ♀·Kopf und Halsschild schwarz, Flügeldecken mit violettem. Schimmer. Kiefertaster gelb, Endglied schwarz; Fühler dunkel;

die Unterseite des ersten und 2. ;bis 4. ganz gelb, Beine dunkel, Knie der Vorder -und Mittelbeine, sowie Schienen und Tarsen aller Beine gelb. Kopf mit den Augen nicht ganz so breit wie der Halsschild, glatt, flach. Fühler fast von halber Körperlänge, 2. Glied nur wenig kürzer als das 3., letztes Glied langgestreckt, fast doppelt so lang wie das 10. Halsschild breiter als lang, von der Mitte nach beiden Seiten fast gleichmässig verengt, alle Ecken verrundet, Scheibe gfatt, ziemlich ·dicht und fein behaart. Flügeldecken äusserst fein punktiert, kurz behaart. Länge: 3 mm. Fundort: China, Zô-Sè 16. 5 1931.

Infolge der einfarbigen Flügeldecken nur mit *A. abdominalis* PIC und *A. languei* PIC verwandt. Die etwas weniger langgezogenen Flügeldecken erinnern an einige *Ebaeus*-Arten, in welche Gattung die Art ev. gestellt werden muss. Von *A. abdominalis* PIC unterscheidet sie sich ausserdem durch die Färbung ·der Beine und Flügeldecken. *A. languei* PIC ist grösser, 5 mm lang, die Flügeldecken schimmern grünlich und die Beine sind weniger stark aufgehellt.“

Distribution. To date the species is only known from the type locality “China, Zô-Sè” (31°05′47″N; 121°11′19″E). This well-known location (renamed Sheshan) is the site of an astronomical observatory built by French Jesuits around 1899 and produces publications such as “Annales de l‘Observatoire astronomique de Zô-sè (Chine)”—see (https://en.wikipedia.org/wiki/National_Astronomical_Observatory_of_China; https://en.wikipedia.org/wiki/Sheshan_Observatory, https://en.wikipedia.org/wiki/Sheshan). “Sheshan is a pair of hills in Songjiang District in western Shanghai, China, distinguished as East Sheshan (100 m elevation) and West Sheshan (97 m elevation), although the more important western hill is merely called Sheshan. There is a small valley between the two hills which is surrounded by “forest park”. Thus, the species is known from Sheshan hills, Songjiang District, western Shanghai, China.

Anthocomus (Anthocomus) kovali **Tshernyshev, sp. n.**

(Figs 1–9)

urn:lsid:zoobank.org:act:9D39DBE2-ACC0-4F94-83ED-2DDEA151EEB3

Material. **China, *Yunnan Province:*** holotype, male, N Wexi City, right tributary of Lapugou River, 2.2 km E Jizong, c. 2705 m, N27°25′5″, E 99°22′9″, 6.VI.2015, leg. I. Belousov, I. Kabak, G. Davidian. (ZISP) (damaged: 9th–11th right antennomeres and 5th–11th left antennomeres absent).

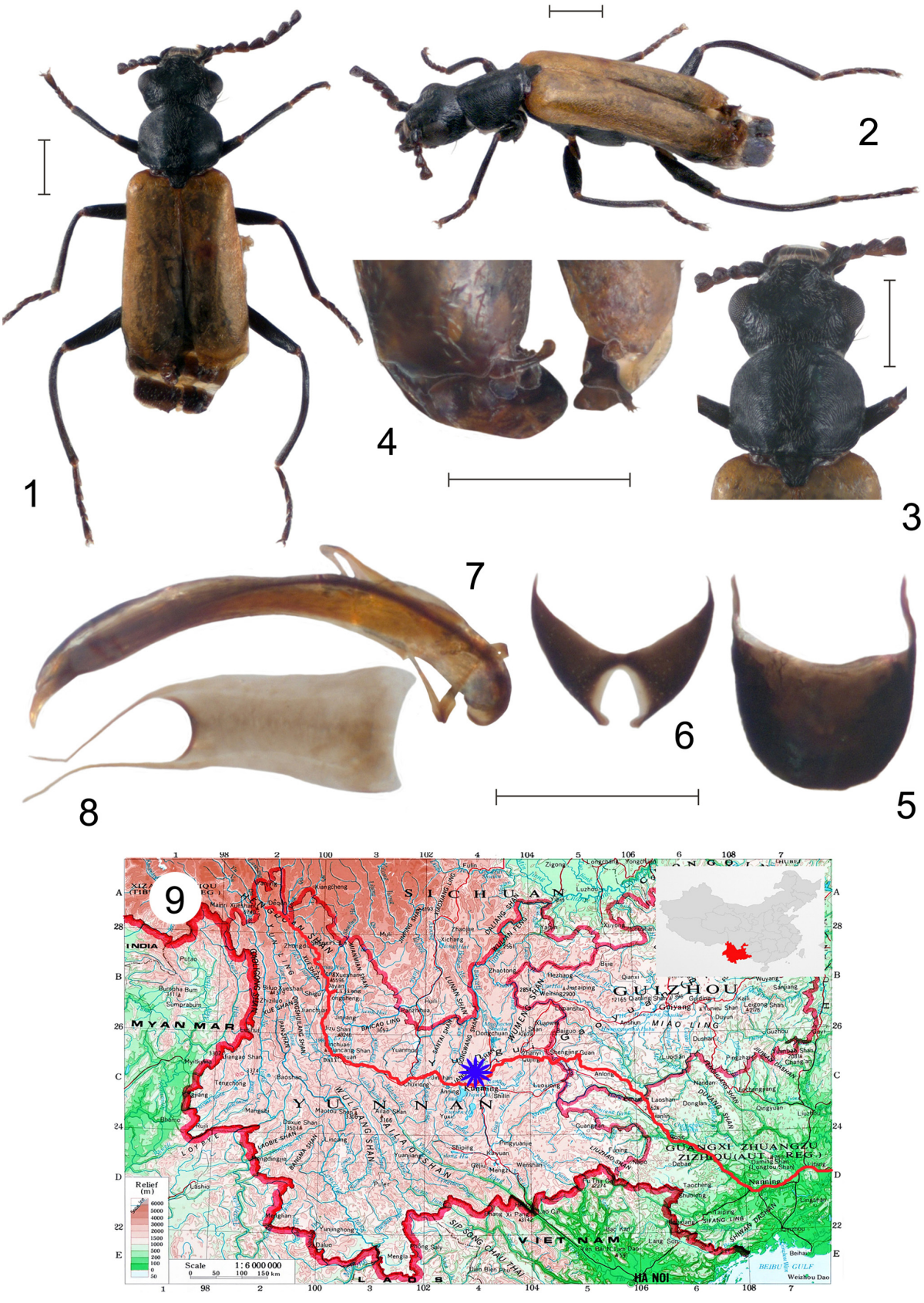
Description. Male (Figs 1, 2). Head, pronotum, scutellum and palpi dark brown to black lacking metallic luster, posterior side of labrum yellow, antennae dark brown, 1st to 4th antennomeres yellow beneath; elytra orange-yellow, impressions in apices orange-red with invagination inside yellow, appendages orange-brown. Ventral side of thorax black, abdominal ventrites with yellow comissure membranes, legs, coxae and trochanters black with comissure part yellow-brown, vesicles pale yellow, thorax mesepimere black.

Head narrow, twice slightly impressed just before the antennae, and with narrow interocular impression (Fig. 3); covered with thin short goldish adpressed pubescence, the row of erect pale hairs is on the clypeus, and several black erect setae are on temples behind eyes; surface sparsely and finely punctuated with distinct microsculpture; labrum short, transversal; genae short, straight; eyes weakly protrudent, round. Palpi elongate, the 1st segment is 1.5 times longer than the 2nd, clavate, the 2nd segment is 1.5 times shorter than the 3rd, subtriangular, apical segment narrow and sinuate to the apex, subconic; surface shining with light short hairs. Antennae dentate; the 1st segment slightly enlarged and clavate, twice longer than the 2nd, the 3rd is 1.3 times as long as the 2nd, and 1.1 times as short as the 4th; 4th–8th antennomeres are the same length and size, 9th–11th antennomeres absent, the 2nd antennomere oval, remaining antennomeres triangular; antennomeres covered with thin light and short semi-erect hairs.

Pronotum equilateral, anterior margin arcuate, posterior straight, all angles rounded, with distinct depressions at the posterior angles (Fig. 3); surface sparsely and finely punctured, microsculpture distinct, covered with dark fine and short adpressed pubescence.

Scutellum rectangular with rounded apex, small, almost completely hidden by the pronotum, flat; the surface shining, evenly punctured and pubescent with adpressed dark hairs.

Elytra parallel, narrow, not widened posteriorly; shoulders distinct; apices evenly rounded and strongly impressed (Fig. 4), with elongate flat and rounded distal margin of the elytra near suture and appendages inside the impression; outer appendage lamellate and vertical, possessing curved hair tuft at the tip, located near suture, inner appendage thin, curved and consisting of two parts, pedicellum at base and an oval flat plate at apex; surface dull, looks chagrin, sparsely punctured and microsculptured, covered with fine, short goldish adpressed pubescence.



FIGURES 1–9. *Anthocomus (Anthocomus) kovali* Tshernyshev, **sp. n.**, holotype, male, external appearance, dorsal view (1); external appearance, lateral view (2); head, pronotum and scutellum, dorsal view (3); apices of elytra (4); pygidium (apical tergite) (5); ultimate abdominal ventrite (apical sternite) (6); aedeagus, dorsal view (7); tegmen (8); locality map (9). Scale bar 0.5 mm.

Wings well developed.

Legs long and thin, posterior femora extending over the elytral apices, posterior tibiae slightly curved outwards, covered with short adpressed dark hairs; claw tarsomeres bear elongate black setae on the upper side; tibiae thin, weakly expanded posteriorly, rounded; femora narrow, compressed, simple, all tarsi 5-segmented, narrow, 1st–4th tarsomeres in anterior legs, 1st and 2nd tarsomeres and 3rd and 4th tarsomeres in intermediate and posterior legs nearly equal in size, the 1st or 2nd tarsomeres are 1.5 times as long as the 3rd or 4th tarsomere in these legs; claws narrow, sharp, with distinct round pellucid lamellae at the base.

Ventral body surface sparsely and finely punctured with distinct microsculpture, shining, sparsely covered with fine, adpressed dark pubescence; metathorax slightly prominent, simple, lacking appendage of hair tuft. Pygidium (apical tergite) (Fig. 5) subquadrate with rounded distal side, 1.3 as wide as long, anterior side evenly rounded; 8th ultimate abdominal ventrite (apical sternite) (Fig. 6) subtriangular, evenly narrowed and rounded at apex, with deep round emargination in the middle. Phallus (Figs. 7) simple, strongly curved dorsally, widened posteriorly, with a sharp and curved downward apical lamella. Tegmen elongate, 2.2 times longer than wide, emarginate in the middle, with long thin appendages, slightly curved at the tips (Fig. 8).

Length (holotype) 3.0 mm, width (at elytral base) 0.7 mm.

Female unknown.

Etymology. The species is named in honour of the famous entomologist Dr Aleksandr Georgievich Koval, All-Russian Institute of Plant Protection (FSBSI VIZR), Saint Petersburg, Russia, who pays particular attention to all material collected being available to study by specialists.

Diagnosis. The new species can be distinguished by its uniformly orange-yellow elytra, a black head and pronotum lacking metallic luster, and the shape of elytral impression and appendages in male (Fig. 4); other differential characters are given in the Key below.

? Anthocomus (Anthocomus) limbellus (Wittmer 1953)

Malachius limbellus Wittmer, 1953: 73 (China: Shanxi);
Anthocomus limbellus: Wittmer 1969: 515;
Anthocomus (incertae sedis) *limbellus*: Mayor 2007: 439.

Remarks. According to the description, this species is very similar to *A. coreanus* Pic but differs in colouration of legs and elytra. The holotype was described with no indication of sex, but since the elytral apices are simple and lack impressions or appendages, it should be transferred from *Anthocomus* Erichson if the holotype is a male. The main differential characters from the original description are as follows: elytra and pronotum black with yellow lateral edges, elytral apices simple, lacking impressions or appendages, with red markings near suture; antennae long and strong, with elongate wide triangular intermediate antennomeres, anterior and intermediate legs yellow, except for darkened tarsi, posterior legs black with yellow coxae and trochanters; palpi yellow with darkened apices. The colour of upperside similar to that of *A. coreanus* Pic, which is comparable with *Haplomalachius* (*Flabellomalachius*) *forticornis* Wittmer, 1984 and *Haplomalachius* (*Flabellomalachius*) *ishiharai* Satô, Wittmer, 1989 and the locally distributed *H.* (*F.*) *ishiharai* subspecies *kasantsevi* Wittmer, 1996.

The original text of the description in Wittmer (1953: 73) is: *"Malachius limbellus* **nov. spec.** Kopf schwarz, vordester Teil und Kiefertaster gelb, deren Spitze schwach angedunkelt. Fühler gelb, 1. und 2. Glied mit einer kleinen, dunkeln Makel auf der Oberseite. Halsschild schwarz, mit schwachem grünlichem Schimmer, Seiten schmal, unregelmässig breit, gelb gesäumt. Flügeldecken schwarz mit kaum wahrnehmbarem Metallglanz, Seiten, von der Basis, inklusive der Schulterbeulen, bis vor den Spitzen mit einem gleichmässig breiten, gelben Saum, vor den Spitzen verschmälert sich der Saum stark und ist nur noch durch einen ganz dünnen Streifen mit der orangeroten Spitzenmakel verbunden. Vorder- und Mittelbeine einfarbig gelb, nur die Tarsen letzterer angedunkelt, Hinterbeine schwarz, mit den Koxen und Trochanteren gelb. Hinterbrust schwarz mit schwachem grünlichem Schimmer, Abdomen schwarz, Segmente schmal gelb eingefasst. Kopf mit den Augen so breit wie der Halsschild, Stirne schwach gewölbt, zwischen den Augen mit einem seichten, leicht queren Eindruck, Oberfläche glatt, mit äusserst feinen Haarpunkten. Fühler vom 3. Gliede an stark gezahnt, jedes Glied länger als an der Spitze breit. Halsschild breiter als lang, Seiten gegen die Basis kaum merklich verengt, Basalecken leicht abgesetzt, Scheibe fast flach, Oberfläche fein mikroskulptiert, fast glatt. Flügeldecken nach hinten kaum erweitert, fast glatt, kurze,

weisse Behaarung fehlt fast ganz, schwarze, aufstehende vollständig. Spitzen der Decken einfach. Länge: c. 4 mm. Fundort: Yangchang, Shansi, N-China 21.4. 1941.

Eine hübsch gefärbte kleine Art, welche nur mit *M. marginipennis* mihi verglichen werden kann. Von dieser leicht zu unterscheiden durch die schmäleren, gelben Seiten des Halsschildes, den gelben, vorderen Teil des Kopfes, die Fühler und 4 Vorderbeine , welche ebenfalls gelb sind. Bei *marginipennis* sind die Seiten des Halsschildes und Vorderteil des Kopfes rot, währenddem die Fühler und die Mittelbeine grösstenteils schwarz sind. Ausserdem sind die Fühler bei *limbellus* viel stärker gezahnt als bei *marginipennis"*.

Distribution. To date, the species is known only from the type locality "Yangchang, Shansi, N-China" (36°34′N; 110°00′E).

Anthocomus (Anthocomus) lineatipennis Wittmer, 1995

Anthocomus lineatipennis Wittmer, 1995: 372–374, Figs. 257–259 (China: Yunnan), 1999: 195;
Anthocomus (incertae sedis) *lineatipennis*: Mayor 2007: 440.

Remarks. This species was described from a batch of beetles consisting of four males, the special male characters of which attributed it to *Anthocomus* Erichson. Furthermore, the dentate antenna, subquadrate pronotum, impressed and appendiculate apices of elytra and simple without indentation posterior tibiae showed it to be a species of the subgenus *Anthocomus (Anthocomus)* Erichson. The main differential characters of the species are: Head and pronotum black with blue metallic luster, elytra pale yellow with black spots and stripes or almost completely black with yellow stripes and yellow apices, palpi, antennae and legs black, impressions in elytral apices of male straight, orange-red, appendages and lower margin of the impression black with a row of hairs, underside of body black lacking metallic luster. This is a high altitude species, all specimens being collected in mountains at elevations c. 3000 m a.s.l.

Distribution. The species was described from Yulong Mountains in Yunnan Province of China (27°00'N; 100°12'E).

? Anthocomus (Anthocomus) mongolicus Wittmer, 1969

Anthocomus mongolicus Wittmer, 1969: 57–58 (Mongolia: Sajn-Šand);
Anthocomus (incertae sedis) *mongolicus*: Mayor 2007: 440.

Remarks. The species is known only from the original description taken from a unique female with a distinctive colouration: "♀—Kopf schwarz mit schwachem, bronzenem Schimmer, Vorderkopf gelblich, einschliesslich der Wangen und Mundteile, der dunkle Teil ist von dem hellen nicht in gerader Linie getrennt, sondern die dunkle Färbung rückt über jeder Fühlerwurzel spitzwinklig bis stumpfwinklig nach vorne; Fühler gelb mit den letzten 3 bis 4 Gliedern, hauptsächlich gegen die Spitze, mehr oder weniger gebräunt; Halsschild schwarz mit schwachem bronzenem Schimmer, Seiten breit gelb bis gelblichrosa; Schildchen schwarz; Flügeldecken gelblich, gegen die Spitze oft rosa werdend, Naht äusserst schmal bis zur Mitte oder fast bis zur Spitze dunkel gefärbt; Beine gelb, nur die Klauen und oft auch das letzte Tarsenglied bräunlich. Kopf mit den Augen nur wenig schmäler als der Halsschild, ein schwacher Eindruck auf der Stirne zwischen den .Augen, Oberfläche fein mikrochagriniert (x 64), schwach glänzend, zerstreut, staubartig behaart. Fühler kurz, die Schulterbeulen erreichend, Glieder 4 bis 10 ganz schwach gezahnt, 4 bis 7 etwas langer als 3 und 8 bis 10. Halsschild breiter als lang, Seiten ziemlich stark gerundet, Basalecken etwas stärker gerundet als die Vorderecken, Basalecken leicht aufgebogen, Oberfläche ähnlich wie der Kopf mikrochagriniert und behaart. Flügeldecken nach hinten schwach verbreitet, Oberfläche fast matt, bei starker Vergrösserung (x 64) sind einzelne, erloschene Punkte sichtbar, wie der Halsschild behaart, ohne aufstehende, längere Haare. Länge: 3 mm. Fundort: Sajn-Šand, 29. V. 1962, leg. R. BIELAWSKI et B. PISARSKI. Holotypus im Zoologischen Institut der PAdW in Warszawa, Paratypus in meiner Sammlung. Die neue Art ist durch die helle Farbung gekennzeichnet, sie kann neben *A. flaveolus* Ab. gestellt werden. Sie unterscheidet sich von dieser Art, gemäss Beschreibung, durch die kleinere Gestalt und den mit einem Längsband versehenen Halsschild." (Wittmer 1969: 57–58).

The elytra light colouration and the pronotum with wide yellow-rose sides differnetiate this species from all *Anthocomus* species known from Mongolia, but align this species to those of the subgenus *Haplomalachius (Flabellomalachius)*, for example *H. (F.) forticonis* Wittmer. Absence of male special characters provide no opportunity to attribute this species to *Anthocomus* Erichson or any other genus of the tribe Malachiini. Thus, if the male could be found, the presence of apical impressions in elytra will allow one to attribute it to *Anthocomus* or *Clanoptilus* Motschulsky, and if the elytral apices are simple to *Haplomalachius* Erichson. This species is only provisionally regarded as belonging *Anthocomus* (?).

Distribution. The species is only known from the type locality, Sainshand, Dornogov (East Gobi) Aimak, Mongolia (N44°53′; E110°08′).

Anthocomus (Anthocomus) similicornis Wittmer, 1999

Anthocomus similicornis Wittmer, 1999: 195, 197, Figs. 95–97 (China: Yunnan);
Anthocomus (incertae sedis) *similicornis*: Mayor 2007: 440.

Remarks. This species was described from a unique male and such characters as dentate antennae, subquadrate and shagreen pronotum, and elytral apices provided with impressions and appendages within, show this to be true *Anthocomus* Erichson, and the straight posterior tibiae allows one to attribute this species to nominative subgenus. The species differs from the congeners by its black head and pronotum having weak pale blue metallic luster, elytra black with yellow apices; antennae and legs black. This is probably a high altitude species, the holotype being collected in mountains at an elevation of c. 3300 m a.s.l.

Distribution. The species is only known from the type locality, Hengduan Meili Mountains in Yunnan Province of China (28°06'N; 98°53'E).

Anthocomus (Anthocomus) testaceoterminalis Wittmer, 1995

Anthocomus testaceoterminalis Wittmer, 1995: 373, 374, Figs. 260–263 (China: Yunnan);
Anthocomus (incertae sedis) *testaceoterminalis*: Mayor 2007: 440.

Remarks. This species is true *Anthocomus* Erichson of the nominative subgenus due to male special characters described, namely: antennae obtuse dentate, pronotum subquadrate and shagreened, the elytral apices impressed and possessing appendages. Head and pronotum with dark blue metallic luster, uniformly black elytra lacking metallic luster, and inner appendages in elytral impressions yellow are differential characters of the species. This is probably a high altitude species since the holotype was collected in mountains at an elevation of c. 2800 m a.s.l.

Distribution. The species is only known from the type locality, Jizu Mountains in Yunnan Province of China (25°58'N; 100°2l'E).

Anthocomus (Celidus) equestris (Fabricius, 1781)

Malachius equestris Fabricius, 1781: 500;
Anthocomus equestris: Erichson 1840: 98;
Anthocomus (Celidus) equestris: Mulsant and Rey 1867: 131, 135–138, Plate 4, Figs 8, 15, 17;
Celidus equestris: Švihla 1996: 480; 1998: 235;
Anthocomus (Celidus) equestris: Mayor 2004: 89, 2007: 439.

Remarks. This is a common *Anthocomus* Erichson species widely distributed in Eurasia throughout Far East and introduced to North America. Small beetles black with distinct green metallic lustre and red elytra possessing W-shape dark fascia below middle. Male of the species is distinctive in posterior tibiae with flexure in middle, elytral apices impressed and provided with lamellate appendages. The species is associated with woody plants during its life-cycle, the larvae feeding on small invertebrates occurring under bark. In the Asian part of Russia, imagos often can be found creeping on windows in city transport saloons, on windows inside buildings, and other urban

habitats. This can probably be explained by the compact planting of poplar trees (and possibly other trees too) in residential areas during the 70 year period of the former USSR. In Siberia this species can usually be collected in poplar forests near rivers or other water reservoirs, and probably poplars are the most preferable trees for larvae *A. equestris* (Fabricius) development. The idea that larvae of the species can feed on fungi stated by Skvarla (2019) has not been established since all Malachiidae larvae are known as predators, and the author's statement that "Larval fungus-feeding seems possible because adults have been reared from fungi and half of all adults found in homes are in bathrooms, which, presuming the beetles are breeding indoors, often have high humidity and are the most likely room to support hidden fungal growth. Their presence in stored food products may also be due to fungal growth that can occur when said products are stored improperly, which is known to support other fungivorous beetles (e.g., *Latridius minutus* (Linnaeus, 1767) and *Cartodere nodifera* (Westwood, 1839)" (Skvarla 2019: 697, 698) could be considered to related to larvae of *A. equestris* (Fabricius) which may feed on "… other fungivorous beetles (e.g., *Latridius minutus* (Linnaeus, 1767) and *Cartodere nodifera* (Westwood, 1839)".

Distribution. The species is widely distributed in the forest zone of Eurasia and has been introduced to North America. It is recorded from Central and Southern Europe, Caucasus, to the Russian Far East: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Finland, Germany, Greece, Italy, Poland, Romania, Russia, Spain, Sweden, Switzerland, and North America: USA and Canada.

Key to species of the genus *Anthocomus* Erichson in Inner Asia and adjacent territories

1. Posterior tibiae in male with distinct flexure in middle (*Anthocomus (Celidus)*); head and pronotum black with weak green metallic luster, palpi yellow-brown, antennae black, 1st to 3rd antennomeres yellow beneath; elytra orange-red with black triangular mark at the base, narrow stripes on humeri and wide inverted V or W-shape spot in posterior half; in male impressions in elytral apices orange-red and inner appendages red-brown, impressions oblique near suture with small bead-shaped appendage at the tip, inner appendages located near suture, flattened, leaf-shaped and with a hair tuft curved above; anterior and intermediate legs yellow, bases of anterior and basal half of intermediate femora, posterior legs black, sometimes intermediate tibiae and tarsi darkened; underside black lacking metallic luster; 2.8 mm . . . . . ***A. (Celidus) equestris*** (Fabricius, 1781)
- Posterior tibiae in male simple, lacking flexure in middle (*Anthocomus (Anthocomus)*) 2
2. Pronotum monochromously dark, head black, labrum sometimes yellow or light brown, antennae dark brown, 1st to 4th antennomeres yellow beneath 3
- Pronotum with contrasting colours of disc dark with yellow or yellow-red lateral margins, head black in basal portion and yellow distally up to level of eyes, antennae yellow or dark-brown 8
3. Elytra monochromously black, sometimes with small red markings at the apices 4
- Elytra red or pale yellow, sometimes with wide black colouration remaining yellow stripes on sides, near suture and on apices 7
4. Elytra with metallic luster 5
- Elytra lacking metallic luster 6
5. Legs dark brown to black with yellow tibiae and tarsi and comissure of femora and tibiae in anterior legs; abdomen black; head and pronotum lacking metallic luster, elytra black with violet metallic luster, palpi yellow with black apical palpomere; 3mm . . . . . ***A. (A.) cyaneipennis*** Wittmer, 1940
- Legs uniformly black; abdomen red; head, pronotum and elytra with strong blue metallic luster so that the beetle looks black-blue; palpi dark brown; in male elytral apices with W-shape impression red coloured inside; 4–5 mm . . . . . ***A. (A.) abdominalis*** Pic, 1903
6. Head and pronotum with dark blue metallic luster, elytra uniformly black; in male elytral apices are obliquely impressed near suture, two appendages are located in the impression, one appendage, curved and yellow, and possessing hair tuft apically, is located inside, and the other one, wide, sclerotised and black, is on outer margin 3.3 mm. . . . . ***A. (A.) testaceoterminalis*** Wittmer, 1995
- Head and pronotum with weak pale blue metallic luster, elytra black with yellow edges of apices; in male elytral apices are straightly impressed, two strong wide and short appendages are located in the impression, one slightly emarginate near suture, and the other one not emarginate near to apical lobe of the lower plate of the impression; 3 mm . . . . . ***A. (A.) similicornis*** Wittmer, 1999
7. Head and pronotum lacking metallic luster, palpi, antennae, except for yellow 1st to 4th antennomeres beneath, and legs, except for yellow commissure parts, black; elytra uniformly dark orange; in male impressions and appendages in elytral apices orange-red, inner side of the impressions yellow; impressions oblique near suture, with lamellate protruding lower margin, outer appendage oval with curved tuft of hairs distally, inner appendage thin and invisible behind it; underside of the body black with a weak green luster, comissure membranes in ventrites yellow; 3 mm . . . . . ***A. (A.) kovali*** Tshernyshev, **sp.n.**
- Head and pronotum with blue metallic luster, palpi, antennae and legs black; elytra pale yellow with black spot at base and longitudinal stripes on sides and near suture, or elytra almost completely black with yellow stripes on sides and near suture and yellow apices; in male impressions in elytral apices straight, orange-red, appendages and lower margin of the impression black, with a row of hairs, outer appendage narrow with hair tuft long curved towards the thin flat inner appendage; underside of body

black lacking metallic luster; 3.5 mm ..... ***A. (A.) lineatipennis*** Wittmer, 1995

8. Elytra yellowish with rose apices and dark suture, head and pronotum with weak bronze luster; palpi yellow, pronotum with wide yellow or rose-yellow lateral sides; antennae yellow, short, reaching humeri, intermediate antennomeres weakly triangular; legs yellow except for brown claws or apical tarsomeres; 3 mm ..... ***A. (A.) mongolicus*** Wittmer, 1969

- Elytra and pronotum black with yellow lateral edges, elytral apices simple, lacking impressions or appendages, with red markings near suture; antennae long, expanded over the basal quarter of the elytra, strong, with elongate wide triangular intermediate antennomeres 9

9. Antennae except for basal antennomeres beneath, and legs almost completely dark; pronotum and elytra lead-black lacking metallic luster, palpi dark with yellow spots at bases of palpomeres; underside of body uniformly dark lacking metallic luster; 3 mm ..... ***A. (A.) coreanus*** Pic, 1911

- Antennae, except for darkened uppersides in 1st and 2nd antennomeres, anterior and intermediate legs yellow, except for darkened tarsi, posterior legs black with yellow coxae and trochanters; pronotum and elytra black with weak green metallic luster, palpi yellow with darkened apices; underside of body dark with weak green metallic luster, abdomen with yellow lateral edges of ventrites; 4 mm ..... ***A. (A.) limbellus*** (Wittmer, 1953)

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