NEW AND LITTLE KNOWN REPRESENTATIVES OF THE GENUS
CHRYSOLINA MOTSCHULSKY, 1860 (COLEOPTERA: CHRYSOMELIDAE) FROM CHINA

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Summary. Chrysolina tshingilica sp. n. is described from Chinggil (Qinghe) county in the Xinjiang Uygur Autonomous Region. It is the first representative of subgenus Arctolina Kontkanen, 1959 in the Chinese part of Altai. Slightly broadened male tarsi, flat intervals and confused rows of elytral punctures readily distinguish new species from known Arctolina. Lectotypes of Chrysolina lobicollis Fairmaire, 1887 and Ch. pubitarsis Bechyné, 1950 are designated and redescribed; both species belongs to the subgenus Allohypericia Bechyné, 1950. Ch. lobicollis Fairmaire, 1887 is resurrected from synonymy with Ch. (Anopachys) aurichalcea (Gebler, 1825) and synonymised with Ch. aeruginosa poricollis (Motschulsky, 1860); Ch. pubitarsis stat. resurr. is resurrected from synonymy with Ch. (Hypericia) difficilis ussuriensis (Jacobson, 1901).

Key words: Chrysolina, Allohypericia, Arctolina, taxonomy, new species, lectotype designation, Altai, China.

INTRODUCTION

In spite of the fact that several summarizing books were published recently, namely “Fauna Sinica” (Yang et al., 2014), “Chinese leaf beetles” (Yang et al., 2015) and “Chrysolina of
the World” (Bienkowski, 2019), still a number of problems remain unsolved in the systematic and taxonomy of Chinese leaf beetles. The preparation of new edition of the Catalogue of Palaearctic Coleoptera encouraged special efforts to resolve these problems and therefore some of them are addressed and elucidated here.

**MATERIAL AND METHODS**

This paper is based on my examination of the type material of Chrysomelidae in the collection of National Museum in Prague, Czech Republic and the specimens collected by I.I. Kabak in the Chinese part of Altai. The following acronyms are used to designate collections, where the material mentioned in the paper is housed: MNHNP – Muséum National d’Histoire Naturelle, Paris, France; NHMB – Naturhistorische Museum Basel, Switzerland; NMPC – National Museum (Národní muzeum), Prague, Czech Republic; ZIN – Zoological Museum of Moscow State University, Russia; YMČ – Yuri Mikhailov personal collection, Yekaterinburg, Russia.

All measurements were made using an ocular grid mounted on MBS-10 stereomicroscope. Total body length was measured from the anterior edge of pronotum to the elytral apex, body width was measured in the broadest part of elytra. In the descriptions of Chrysolina species the list of necessary morphological features proposed by Bienkowski (2019) was taken into account. The exact label data are cited for all type specimens. Separate labels are divided with “|”, separate lines of one label – with “/”. Other comments and remarks: p – preceding data are printed, h – preceding data are handwritten, w – white label, r – red label, y – yellow label.

**TAXONOMY**

*Genus Chrysolina Motschulsky, 1860*

*Subgenus Allohypericia Bechyné, 1950*

*Allohypericia* Bechyné, 1950: 159. Type species: *Chrysomela lobicollis* Fairmaire, 1887 [=*Chrysolina aeruginosa poricollis* (Motschulsky, 1860)], by original designation.


**REMARKS.** *Chrysomela lobicollis* Fairmaire, 1887 was originally designated as a type species of the subgenus *Allohypericia* Bechyné, 1950. Subsequent authors (Gressitt & Kimoto, 1963; Mohr, 1966; Bienkowski, 2001, 2007) considered *Ch. lobicollis* conspecific to *Ch. aeruginosa*. But Bourdonné (2010) examined a type specimen of *Ch. lobicollis* in MNHMP and found that this taxon belongs to the subgenus *Anopachys* Motschulsky, 1860. Subsequently the name *Allohypericia* became a junior synonym of *Anopachys* (Bourdonné, 2010) and therefore the new subgenus *Bourdonneana* Kippenberg, 2010 was established for the species earlier included in *Allohypericia* except for *Ch. lobicollis*.

Bienkowski (2019) disagreed with the above mentioned acts and stated that Bechyné (1950) incorrectly and unintentionally identified the type species *Ch. lobicollis*. He proved this point of view by the examination of a specimen from the G. Frey’s collection (NHMB) with the label: "*Chrysolina lobicollis* Frm. Det. Dr. J. Bechyné 1950" identified as *Ch. aeruginosa poricollis*. That is why Bienkowski (2019) for the stability of the nomenclature used Article 70.3 of the Code (ICZN, 1999) and designated *Taeniosticha poricollis* Motschulsky,
1860 as a type species of the subgenus *Allohypericia* to make this subgeneric name valid. However, this act proved to be unnecessary because of the present designation of lectotype of *Chrysomela lobicollis* found in NMPC. The designation of the lectotype below restores the initial status of *Chrysomela lobicollis* as a type species of *Allohypericia* by the original designation and once again proves the validity of *Allohypericia* that is not a synonym of *Anopachys*.

*Chrysolina (Allohypericia) aeruginosa poricollis* (Motschulsky, 1860)

Figs 1, 2

Taeniosticha poricollis Motschulsky, 1860: 228 (lectotype – ♀, "Mongolie" (refers to Inner Mongolia), in ZMMU, designated by Bieńkowski, 2001: 108; examined).

*Chrysomela (Allohypericia) aeruginosa poricollis* Bieńkowski, 2001: 108; Yang et al., 2015: 66; Bieńkowski, 2019: 46;

*Chrysomela lobicollis* Fairmaire, 1887: 331 (lectotype – ♀, "Chine: Peking"; in NMPC; here designated).

*Chrysomela (Allohypericia) lobicollis* Bechyné, 1950: 159;


*Chrysolina (Allohypericia) aeruginosa lobicollis* Bechyné, 1952: 382.


**REDESCRIPTION.** Female (lectotype of *Chrysomela lobicollis*). Body convex, ovate, length - 7.1 mm, width - 5.2 mm. Dorsum shining, smooth, metallic bronze; underside, legs, antennae, maxillary palpi and tarsi pitchy brown, antennomeres 1 and 2 rufous below.

Head: frontoclypeus covered with sparse coarse punctures; frontal and epicranial sutures slightly deepened. Last maxillary palpomere barrel-shaped, widely truncate apically, 1.3x longer than broad, not longer and 1.2x wider than previous palpomere. Relative length of antennomeres 1–3 as ratios 8, 5, 6. Tenth antennomere 1.7x longer than broad, eleventh antennomere - 2x. Orbital lines narrow, not reaching antennal insertion. Antenna inserted 1.2x closer to eye than to clypeus.

Thorax: pronotum transverse, 2.3x broader than long, broadest at base; pronotal disc evenly convex, covered with dense medium sized punctures; sides straightly narrowed in basal 2/3 and rounded only at anterior angles; width between anterior angles 1.5x less than basal width. Anterior angles produced, triangular; basal angles acute; anterior side margined and ciliate; basal edge arcuately convex. Lateral sides swollen along entire length, lateral callos narrow, lateral impression moderately deep and filled with coarse punctures partly coalescent in basal half. Prothoracic hypomera slightly convex, smooth, outer side almost flat and covered with wrinkles, basal fold not pronounced; prosternal process almost flat longitudinally, covered with coarse punctures; anterolateral portion of prosternum narrow, with slightly impressed furrow medially; prosternum 1.35x shorter than metasternum; metasternum 1.1x shorter than first ventrite. Scutellum triangular, smooth.
Elytra with weak humeral callus and flat intervals, each elytron 1.9 times longer than wide, elytral length 5.7 mm. Primary punctures moderately large, scutellar row quite long, consist of 10 punctures, rows 2-9 regular, paired, punctures spaced at distance mainly twice larger than their diameter. Secondary puncturation consists of fine and medium sized punctures. Marginal stria with large sparse impressed punctures. Sutural stria distinct at apical slope. Epipleura inclined outside, visible along entire length. Hind wings absent.

Tarsi narrow, fore tarsi 2.7x as long as broad, ratio of width of fore tarsomeres 1–3 as 1.0, 0.8, 1.2. Tarsomeres 1 of all tarsi with moderately broad glabrous stripe beneath; tarsomeres 2 and 3 of hind tarsi also with glabrous stripe beneath but narrow.

Figs 1–4. Habitus in dorsal view and labels of the types. 1, 2 – Chrysomela lobicollis Fairmaire: 1 – lectotype, female; 2 – labels of lectotype; 3, 4 – Ch. pubitarsis Bechyně: 3 – lectotype, male; 4 - labels of lectotype. Scale bars = 2 mm.
Abdomen: pygidium with deep groove along entire length; ventrite 1 broadly margined on anterior edge, covered with sparse medium-sized punctures, only anterior intercoxal process covered with coarse punctures modified into deep longitudinal wrinkles. Last ventrite slightly convex, with slightly incised apex, medially almost impunctate.

REMARKS. Chrysomela lobicollis Fairmaire, 1887 was synonymised with Chrysolina (Allohypericia) aeruginosa poricollis (Motschulsky, 1860) by Bienkowski (2001) without examination of any types. Bourdonné (2010) resurrected Chrysomela lobicollis from the synonymy with Ch. aeruginosa poricollis and transferred it to the subgenus Anopachys, however, in this note or later he did not give any redescription or figures and did not designate the examined specimen as lectotype. The specimen of Ch. lobicollis (male) from MNHNP labeled by J.-C. Bourdonné in 2002 as “holotype” was examined by Bienkowski (2019). In fact this specimen is a syntype, because Fairmaire (1887) did not indicate a number of type specimens. The peculiar aedeagus shape of this syntype proves its position in the subgenus Anopachys close to Chrysolina aurichalcea.

However, in the collection of NMPC I found another syntype of Chrysomela lobicollis, a female (Fig. 1) that was studied by Bechyné (1950) because he mentioned the data from these labels. For the stability of the nomenclature according to Article 74 of the Code (ICZN, 1999) and because this has not been done before I designate this specimen as a lectotype of Chrysomela lobicollis.

The comparison of lectotype of Ch. lobicollis with the representatives of the subgenera Anopachys and Allohypericia shows that it is exactly belongs to the latter (according to the original intention and taxonomical feeling of J. Bechyné). Having elytra with regular rows of large punctures, dorsum moderately shining and bronzy-black, all tarsomeres 1 with glabrous stripe beneath, pygidium with deep groove along entire length, it can be treated conspecific with Chrysolina aeruginosa (Faldermann, 1835). This was earlier found by Mohr (1966), who treated it as a subspecies of Ch. aeruginosa. But from five currently recognized subspecies of Ch. aeruginosa every one can be found in China (Yang et al., 2015; Bienkowski, 2019). The nominotypical subspecies occurs in North and North-West parts of China, ssp. chingana Bechyné, 1952, ssp. muralis (Csiki, 1901) and ssp. poricollis (Motschulsky, 1860) in North-East part of China, and ssp. kabana Lopatin, 2009 in Gansu. The proper revision of these subspecies has never been done and their distribution is not well documented. However, the preliminary keys to subspecies of Ch. aeruginosa are available (Yang et al., 2015; Bienkowski, 2019). According to them and the comparison with the lectotype of Taeniosticha poricollis Motschulsky, 1860 in ZMMU I can prove that Chrysomela lobicollis Fairmaire is a synonym of Ch. aeruginosa poricollis (Motschulsky, 1860).

Chrysolina (Allohypericia) pubitarsis Bechyné, 1950, stat. resurr.
Figs 3–5

REDESCRIPTION. Male (lectotype). Body moderately convex, elongate, ovate; length – 6.2 mm, width – 4.1 mm. Dorsum shining, smooth, metallic bronze; underside, legs, antennae, maxillary palpi and tarsi pitchy brown, antennomeres 1 and 2 rufous.

Head: frontoclypeus densely covered with large punctures; frontal suture not pronounced, epicranial suture slightly deepened. Last maxillary palpomere barrel-shaped, truncate apically, 1.2x longer than broad, 1.3x longer and 1.1x wider than previous palpomere. Relative length of antennomeres 1–3 as ratios 7, 4, 7. Tenth antennomere 1.4x longer than broad, eleventh antennomere – 2.1x. Orbital lines narrow, not reaching antennal insertion. Antenna inserted 1.1x closer to clypeus than to eye.

Figs 5–6. Aedeagus in dorsal and ventro-lateral view. 5 – *Chrysolina pubitaris* Bechyně (lectotype, not completely mature); 6 – *Ch. mauroi* Lopatin (holotype, China: Sichuan), modified from Bienkowski (2019). Scale bars = 0.5 mm.

Thorax: pronotum transverse, twice broader than long, broadest at base; pronotal disc evenly convex, covered with dense medium sized punctures; sides almost straight and parallel in basal 2/3 and rounded only at anterior angles; width between anterior angles 1.5x less than basal width. Anterior angles produced, triangular; basal angles acute; anterior side margined and ciliate; basal edge arcuately convex. Lateral sides swollen along entire length, but visibly margined in dorsal view, lateral callus narrow, lateral impression present along entire length, moderately deep and filled with coarse punctures partly coalescent in basal 3/4. Prothoracic hypomera slightly convex, outer side almost flat and shagreened with impression at basal 1/4 covered with merged large punctures; basal fold pronounced; prosternal process almost flat longitudinally, covered with coarse punctures; anterolateral portion of prosternum narrow, with slightly impressed furrow medially; prosternum 1.1x shorter than metasternum; metasternum 1.25x shorter than first ventrite. Scutellum triangular, smooth, with only few fine punctures near base.

Elytra with weak humeral callus and flat intervals, each elytron 2.25 times longer than wide, elytral length 4.2 mm. Primary punctures moderately large, scutellar row quite long, consist of 8-9 punctures, rows 2-9 regular, slightly paired, punctures spaced at distance mainly twice larger than their diameter. Secondary punctuation consists of very fine and fine punctures; latter rare and predominate on even intervals. Marginal stria with large sparse impressed
punctures. Sutural stria distinct at apical slope. Epipleura inclined outside, visible along entire length. Hind wings absent.

Tarsi only slightly broadened, fore tarsi 2.7x as long as broad, ratio of width of fore tarsomeres 1–3 as 1.0, 0.8, 1.2. Tarsi with entire sole beneath, only all tarsomeres 1 in basal 2/5 with short glabrous stripe beneath.

Abdomen: pygidium with impression in basal half; all ventrites with pronounced greenish luster; ventrite 1 broadly margined on anterior edge, covered with sparse medium-sized punctures, only anterior intercoxal process covered with large punctures fused with longitudinal wrinkles. Last ventrite slightly convex, apex broadly truncate, medially covered with sparse punctures. Aedeagus with slightly narrowed and broadly rounded apex and sharp denticles ventrally at its sides (Fig. 5).

DIFFERENTIAL DIAGNOSIS. Among Allohypericia only one species has all tarsomeres 1 entirely pubescent beneath in both sexes, namely Ch. mauroi Lopatin, 2005 from Sichuan. Besides tarsal pubescence it similarly has impression in basal half of pygidium and similar aedeagus shape (Fig. 6).

REMARKS. Bechyné (1950) compared Ch. pubitarsis with Ch. lobicollis and Ch. aequilines and placed it in the subgenus Allohypericia. Although he noted its difference from all other members of this subgenus in tarsi wholly pubescent beneath in both sexes. Bietkowsk (2001) examined one female determined by J. Bechyné as "Ch. pubitarsis" and found this specimen conspecific with Ch. difficilis. This specimen was not syntype, moreover it was collected not in Beijing, but in Manchuria. However based solely on such questionable material Bietkowsk (2001, 2019) placed Ch. pubitarsis in the subgenus Hypericia Bedel, 1892 and synonymised it with Ch. difficilis.

I found the type of Chrysolina pubitarsis in the collection of NMPC. It is a male but nobody prepared the aedeagus before. Although the specimen is not entirely mature, the aedeagus shape is clear (Fig. 5). I did not find the female syntype but according to the original description it existed and had all tarsomeres 1 entirely pubescent beneath. However, it is possible that female is not conspecific with the male type. Here I designate the lectotype of Chrysolina pubitarsis and confirm that it is a representative of subgenus Allohypericia as originally stated by J. Bechyné. The redescription is given above because the original description of this species (Bechyné, 1950) is brief and includes mainly differential diagnosis.

Subgenus Arctolina Kontkanen, 1959

Arctolina Kontkanen, 1959: 31. Type species: Chrysomela birulai Jacobson, 1910 [= Chrysolina subsulcata (Mannerheim, 1853)], by original designation.

COMPOSITION. Arctolina is arcto-boreo-montane subgenus with 19 species (Kippenberg, 2010a) known from the Arctic territories, the Urals, Altai, Saur-Tarbagatai Mountains and Dzungarian Altai, where the species diversity hotspot is situated. Two species from the subgenus are known from China (Yang et al., 2015): Ch. borochorensis Lopatin, 2000 and Ch. boreosinica Lopatin, 2004, and both were found in Tien-Shan Mountains. The new species described below is the first representative of Arctolina in Mongolian Altai in general and in the Chinese part of Altai.

Chrysolina (Arctolina) tshingilica Mikhailov, sp. n.

http://zoobank.org/NomenclaturalActs/0124DA18-EF3B-48B8-B277-BD47EAAC6C80

Figs 7–10

TYPE MATERIAL. Holotype: ♂, with labels: China, Xinjiang, S Altai Mts., / Keshtau Mt., ENE Qinghe / (Chinggill), h=2920–3345 m, / 46°48′30″N, 90°44′05″E / 46°46′16″N,
DESCRIPTION. Male (holotype) (Fig. 7). Moderately convex, ovate. Body length - 5.9 mm, width - 3.8 mm. Dorsum shining, finely shagreened, bicolor, elytra emerald green, pronotum and head green with violet reflex; underside and legs black, with feeble bronze reflex. Antennae, maxillary palpi and tarsi dark brown, antennomeres 1 and 2 beneath and claws rufous.

Figs 7–8. Habitus of Chrysolina (Arctolina) tshingilica sp. n. 7 – male (holotype); 8 – female (paratype). Scale bar = 1 mm.

Head: frontoclypeus coarsely and sparsely punctured; frontal and epicranial sutures slightly deepened. Last maxillary palpomere barrel-shaped, narrowly truncate apically, 1.2x longer then broad, 1.5x longer and 1.2x wider than previous palpomere. Relative length of antennomeres 1–3 as ratios 7, 3, 4. Tenth antennomere 1.5x longer than broad, eleventh antennomere – 2.1x. Orbital lines narrow, almost reach antennal insertion. Antenna inserted 1.2x closer to clypeus than to eye.

Thorax: pronotum transverse, almost twice (exactly 1.9x) broader than long, broadest anterior to middle; pronotal disc evenly convex, except for smooth ovate area medially covered with dense fine punctures; sides slightly rounded; width between anterior angles 1.5x less than basal width. Anterior angles moderately produced, rounded triangular; basal angles obtuse; anterior side margined and ciliate, widely incised in bracket-shape; basal edge arcuately covex; lateral sides swollen along entire length, lateral callus narrow, separated from disc by deep
groove with vertical outer border in basal 2/5 and by slight impression with large punctures in anterior part. Prothoracic hypomera slightly convex, outer side almost flat and shagreened with impression at basal 1/4 covered with merged coarse punctures; basal fold pronounced and very deep; prosternal process slightly convex longitudinally; anterolateral portion of prosternum narrow, with slightly impressed furrow medially; prosternum 1.5x shorter than metasternum; metasternum of the same length as first ventrite. Scutellum triangular, with sparse, fine punctures.

Figs 9–12. Aedeagus in lateral and dorsal view. 9, 10 – *Chrysolina (Arctolina)* tshingilica sp. n.: 9 – holotype; 10 – paratype; 11 – *Ch. (Pleurosticha)* shapkini Mikhailov et Gus’kova (Mongolia, Mongolian Altai); 12 – *Ch. borochorensis* Lopatin, paratype (China, Tien-Shan Mountains). Scale bars = 1 mm.
Elytra with very weak humeral callus and flat intervals, each elytron 2.25 times longer than wide, elytral length 4.2 mm. Medium-sized primary punctures form scutellar row of 8–9 punctures and 9 partly confused rows, from which rows 4 - 6 strongly confused. Secondary punctuation consists of very fine and fine punctures; latter almost of the same size as on pronotum, they predominate on odd intervals and together with fine wrinkles conceal puncture rows. Marginal stria with large sparse impressed punctures. Sutural stria distinct at apical slope. Epipleura inclined outside, visible along entire length. Hind wings absent.

Tarsi only slightly broadened, fore tarsi 2.5x as long as broad, ratio of width of fore tarsomeres 1–3 as 1.1, 0.9, 1.2. All tarsomeres with entire sole beneath.

Abdomen: pygidium without any impressions. Ventrite 1 broadly margined on anterior edge, covered with sparse medium-sized punctures, only anterior intercoxal process covered with large wrinkles. Last ventrite very slightly convex, with slightly incised apex, medially covered with sparse medium-sized punctures. Aedeagus (Fig. 9) laterally crescent with slightly broadened rounded triangular apex and small alae.

Variability. Male (paratype). Body length 5.4 mm, width 3.5 mm. Dorsum shining, bicolor, elytra violetish green, pronotum and head green with bronze reflex. Aedeagus slightly different from holotype (Fig. 10).

Female. Body moderately convex, obovate; length 6.1–7.1 mm, width 4.0–4.4 mm. Dorsum shining, finely shagreened, unicolor green with violet reflex, golden green or bicolor, elytra emerald green, pronotum and head green with violet or bronze reflex (Fig. 8). Underside, legs, antennae same colour as in males. Tarsi narrow, fore tarsi 2.3x as long as broad, ratio of width of fore tarsomeres 1–3 as 1.1, 0.9, 1.2. All tarsomeres with entire sole beneath.

DIFFERENTIAL DIAGNOSIS. Habitus and colour pattern is somewhat similar to the representatives of Allohypericia, namely Ch. centralasiae Lopatin, 1970 but pronotum structure and absence of wings readily distinguish the new species. The combination of characters makes it a member of the subgenus Arctolina and the first representative of this subgenus in the Chinese part of Altai Mountains. The closely related subgenus Pleurosticha Motschulsky, 1860 also has the only representative Ch. shapkini Mikhailov et Gus’kova, 2013 recently described from Mongolian Altai (Hovd aimak of Mongolia). This species also has flat elytral intervals but peculiar aedeagus shape with larger and much more exposed alae (Fig. 11).

Two previously known Chinese Arctolina species were found in Tien-Shan Mountains. The combination of such peculiar characters as slightly broadened male tarsi, completely flat elytral intervals with confused rows of relatively small punctures, which are hardly visible and concealed by secondary punctuation, readily distinguish the new species in the subgenus. Ch. borochorensis and Ch. boreosinica have somewhat similar aedeagus shape (Fig. 12), but both have dilated male tarsi, regular rows of large and dense elytral punctures with flat or convex intervals and shallow pronotal impressions. In some species from Dzungarian Altai, namely Ch. kryzhanovskii (Lopatin, 1968) and Ch. valichanovi Lopatin, 1990, males also have flat elytral intervals, but in females intervals are convex. The new species has flat elytral intervals in both sexes and different aedeagus shape.

ETYMOLOGY. The name is derived from the Latinized common local name Chingil (also Chinggil or Qingil) of the Qinghe County, where the type locality is situated.

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