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A new species of *Protaetia* Burmeister, 1842 from Armenia with taxonomic notes on *Cetonia floricola fausti* Kraatz, 1891 (Coleoptera: Scarabaeidae: Cetoniinae)

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Abstract

The history of usage of the name *Cetonia floricola fausti* Kraatz, 1891 (Coleoptera: Scarabaeidae: Cetoniinae) is discussed. In recent publications, the name *Protaetia* (*Potosia*) *fausti* was applied to a taxon that is not conspecific with Kraatz's holotype. We therefore reassign the name *Cetonia fausti* Kraatz, 1891 as a junior synonym of *Protaetia splendidula* (Faldermann, 1835) and discuss the justification for this synonymy. The taxon that was erroneously called *Protaetia fausti* in recent papers actually includes two distinct species: *Protaetia jelineki* (Petrovitz, 1981) and a species described in this paper as *Protaetia* (*Potosia*) *haiastanica* **new species** from northwestern and central Armenia and southwestern Georgia.

Key words: *Potosia haiastanica*, Georgia, Cetoniini, Palaearctic

Introduction

The complex of forms related to *Protaetia* (*Potosia*) *cuprea* (Fabricius, 1775) (Coleoptera: Scarabaeidae: Cetoniinae) is one of the most unresolved and confused taxonomic problems in Palaearctic Scarabaeoidea. Several authors after Fabricius have proposed more than 100 names related to this group, and the classification of the majority of them remains disputable (Mikšič 1987).

One of the most mysterious names in the group is *Protaetia* (*Potosia*) *fausti* (Kraatz, 1891). This name, originally erected as a variety, was applied by subsequent authors to taxa of various rank, both specific and infraspecic (subspecies, variety, morph, etc.). In most recent publications the name *Protaetia fausti* is arbitrarily applied to a species distributed in southwestern Transcaucasia and northeastern Turkey.

The study of material recently collected in Armenia and Turkey and of some specimens from different collections showed that Transcaucasian populations belong to a species that is not conspecific with Kraatz's holotype and which is to date undescribed, while populations from northeastern Turkey are *P. jelineki* (Petrovitz, 1981).

In this paper the history of usage of the name *Protaetia fausti* is traced and discussed and the material from southwestern Transcaucasia is described as *Protaetia* (*Potosia*) *haiastanica* **new species**.

Material and methods

This study is based on review of the material from several institutions and private collections. The following abbreviations are used in the text.

ISCR—I. Shokhin collection, Rostov-on-Don, Russia
IZAY—Institute of Zoology, Scientific Center of Zoology and Hydroecology, Yerevan, Armenia
JACH—Jean-Louis Alpanseque collection, Le Havre, France

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MKCY—M. Kalashian collection, Yerevan, Armenia
NMPC—Národn Muzeum v Praze, Prague, Czech Republic
SDEI—Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
TGCY—T. Ghrejyan collection, Yerevan, Armenia.
ZIN—Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia

Specimens deposited in ISCR, IZAY, MKCY, TGCY, JACH and specimens from Turkey provided by Maurizio Bollino (Italia, Lecce) and Dr. Guido Sabatinelli (Prévessin, France.) were studied. In addition, photographs of the holotypes of *P. fausti* (provided by Dr. Stephan Blank and Mr. Lutz Behne, SDEI) and *P. jelineki* (provided by Dr. Jiři Hayek, NMPC), photographs of specimens deposited in ZIN and studied by Medvedev (provided by Dr. M. Volkovitsh, ZIN), and the figures from the publications of Rataj (1986, 1998) were reviewed.

The labels are cited using the following abbreviations: (h)—handwritten text, (p)—printed text, ###—illegible portions of text. Some additional comments or interpretations are included in square brackets and the data of individual labels are separated by slash mark "/".

Protaetia fausti (Kraatz): history and identity

The name *Cetonia floricola fausti* Kraatz, 1891 was proposed as a variety of *Cetonia floricola* (Herbst, 1790) (=*Protaetia* (*Potosia*) *metallica* (Herbst, 1782)), based on a single specimen originating from the "Caucasus" (without exact locality data) collected by J. Faust (Kraatz 1891). Reitter (1899) and Olsoufieff (1916) cited *Protaetia fausti* as variety of *Potosia cuprea* (Fabricius, 1775), reporting it for "Russian Armenia", and in Winkler (1929) classified it as a subspecies with the distribution in "Armenia". In his revision of Palearctic *Potosia* Mulsant & Rey, 1870, Mikšič (1961) considered *P. cuprea* as a single polytypic species, dividing it into 16 subspecies. The name *Protaetia fausti* was not mentioned in this work.

In his monograph of flower chafers of the fauna of the Soviet Union, Medvedev (1964) classified several forms of *P. cuprea* complex as separate species. One of these names was *Potosia fausti*, for which he described specimens at his disposal that had originated from southwestern Georgia (Borzhomi) and northwestern Armenia (Leninakan—now Gyumri). Mikšič (1966a, 1966b) did not accept Medvedev's classification and as before considered *P. cuprea* as a single polytypic species.

Iablokoff-Khnzorian (1967), in a footnote comment on *Netocia* (*Potosia*) *cuprea* (footnote pp. 212–213), citedthe classifications of both of Medvedev and Mikšič, but favored the latter. However, in the species treatment of *N. cuprea*, he classified all the names relating to the Armenian fauna as synonyms (*P. metallica, P. fausti, P. splendidula* (Faldermann, 1835)*, P. hieroglyphica* (Ménétries, 1832)*, P. cuprina* (Motschulsky, 1849)*, P. caucasica* (Kolenati, 1845)).

Rataj (1986) used the description of Medvedev (1964) to identify a small series of specimens from central Armenia (Garni near Yerevan) as *P. fausti*. Rataj (1986) briefly described this taxon and illustrated the male genitalia for the first time. The general distribution of the taxon was given according Medvedev (southwest Georgia and southwest Armenia). Later Rataj (1998) included the neighboring part of northern Turkey in the distribution of the species, but the brief description and photograph he used in this publication were based on his material from central Armenia ("Garni and Geghard"). This concept of the species and the usage of the name *P. fausti* was accepted by Baraud (1992) and Krajcik (1999).

Finally, in both editions of Catalogue of Palaearctic Coleoptera (Smetana 2006; Bezděk 2016), *P.* (*Potosia*) *fausti* is classified following Rataj (1986, 1998) as distinct species distributed in Armenia, Georgia, and Asian Turkey.

It must be stressed that none of these authors except Mikšič (and possibly Reitter) studied the holotype of *P. fausti*. Mikšič (1987) briefly re-described the holotype and came to the conclusion that *P. fausti* was a color form of *P. cuprea splendidula*.

Through the kindness of Dr. Stephan Blank and Mr. Lutz Behne (SDEI), we have studied photographs of the *P. fausti* holotype (Holotype, ♀: Caucas.[us] (h) / var. Fausti mihi, 90, aurei### luic### imaculata (h, Kraatz' hand) / subfus. med. purp. (h) / coll. Kraatz (p) / ab. fausti Kr. (h) / TYPUS (p, on red paper) (Fig. 9). Our study of the holotype images allowed us to support opinion of Mikšič (1987) that name *P. fausti* must be a junior synonym of *Protaetia* (*Potosia*) *splendidula.* Clarification of the taxonomic status of species and associated synonyms requires a review of specimens from across the distribution, which is the subject of a separate work.

Our examination of figures from Rataj (1986, 1998), photographs of the specimens mentioned by Medvedev, specimens from the IZAY collection, and several specimens recently collected in Armenia revealed that the name *Protaetia fausti*, in the erroneous current usage, actually applies to two distinct species. One of the species is distributed in northeastern Turkey, and has already been described as *P. jelineki* (Petrovitz, 1981). No name is available for the second species so it is described below as a new species.

Protaetia (*Potosia*) *hajastanica* Ghrejyan & Kalashian, new species

(Figs 1–2, 10, 14, 18)

Potosia fausti: Medvedev 1964 (misidentified, nec Kraatz, 1891)
Potosia fausti: Rataj 1986, 1998 (misidentified, nec Kraatz, 1891)
Protaetia (*Potosia*) *fausti:* Smetana 2006; Bezděk 2016 (misidentified, nec Kraatz, 1891)

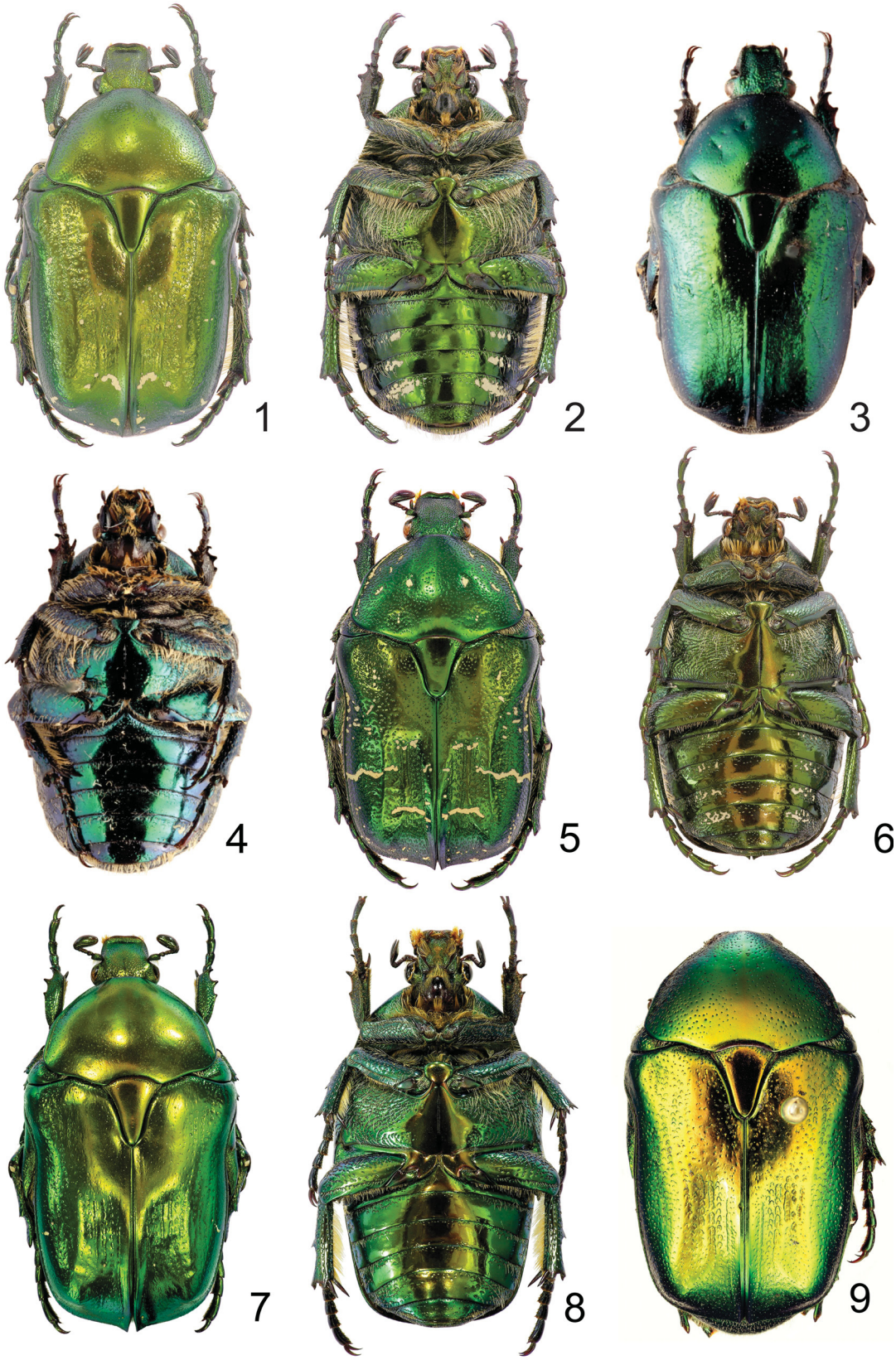
Type material. **Holotype**: ♂, Armenia, Kotayk prov., S env. Geghadir, N40.1470º E44.6556º, 1620 m, 24.06.2015, T. Ghrejyan leg. (IZAY). **Allotype**: ♀, same data as holotype (TGCY). **Paratypes:** 5 ♂, 5 ♀, same data as holotype (TGCY, 1 ♂ in JACH); 1 ♂, Armenia, Yerevan, 25.07.1993, Kalashian leg.; 2 ♂, 1 specimen with sex not determined, Armenia, Kotayk prov., env. Geghadir, 25.07.1997, Malkhasian leg. (MKCY); 3 specimens with sex not determined, Armenia, Kotayk prov., env. Geghadir, 09.07.2003, Malkhasian leg. (MKCY); 1 ♂, Armenia, Kotayk prov., env. Jrvezh, 15.07.1999, Kalashian leg. (MKCY); 1 ♂, 1 ♀, Armenia, Gegharkunik Prov., env. Martuni, 20-30.07.2012, Ghrejyan leg. (TGCY); 1 ♀, Armenia, Leninakan [now Gyumri], 20.VI. [1]934, Ter-Minassian [leg.] (in Russian) (ZIN, studied using photographs); 1 ♀, [Georgia] env. Borzhomi, Tiflissk. gub. [Tbilisi province], V.[1]910, Kapitonov [leg.] (in Russian) (ZIN, studied using photographs); 8 ♂, 1 ♀, [Armenia] Erivansk. gub. [Erivan Prov.], Amamly [=Spitak], Maljuzhenko (IZAY); 1 ♂, 2 ♀, Armenia, Leninakan [=Gyumri], Keti. 17.08.1938. Leg. Avagyan, (IZAY); 1 ♀, Armenia, pr. Eriwan, 9.[19]21, A. Schelkovnikov [leg.] (IZAY); 1 ♀, Armenia, Arzakend [=Arzakan], 25.07.1930. A.Schelkovnikov [leg] (IZAY); 1♂, Armenia, pr. Talin, 12.vii.[19]28, O. Amirdjanian [leg.] (IZAY); 1 ♂, 1 ♀, Armenia, Yerevan-Arinj, 40.2171° 44.6004°, 1400 m, 19.06. 2016, I. Shokhin leg. (ISCR); 1 ♂, 1 ♀, ARMENIA, Aragatsotn prov., NW env. Mastara, N40.4628 E43.8604, 1910 m, 08.08.2016, Ghrejyan leg. (TGCY).

Description. Body (Figs. 1–2) robust and convex, slightly narrowed caudally, moderately shiny, in holotype and majority of paratypes golden-green sometimes with red reflections, rarely body darkened to olive-green with cupreous reflections. Body length 15.0–25.1 mm (holotype 22.6 mm), width 8.4–11.2 mm (holotype 12.3 mm).

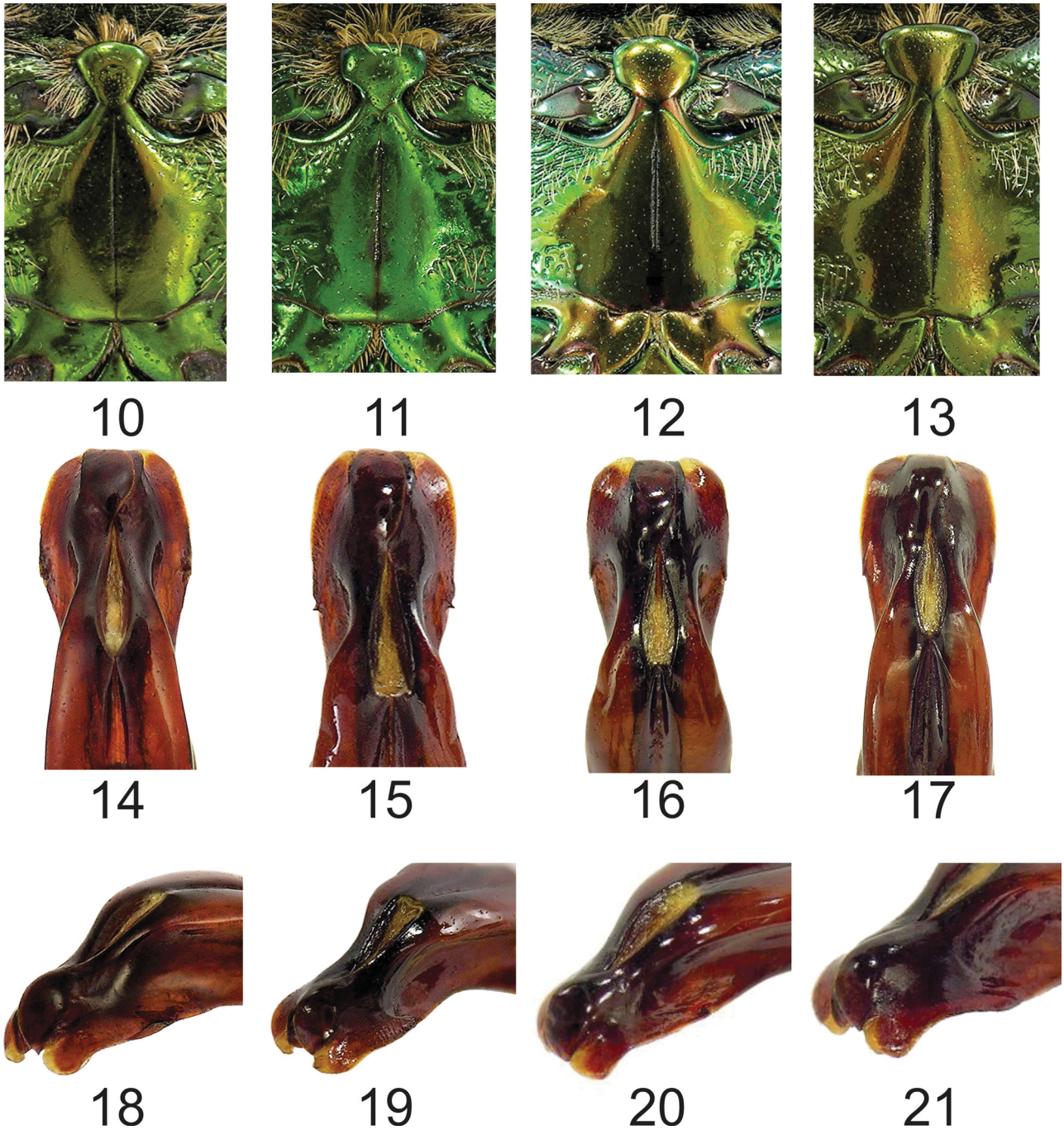
Head moderately large and wide; clypeus with keel-shaped anterior and lateral margins, anteriorly with distinct incision, slightly convex medially; convexity evenly continuous on frons. Clypeus with small, sparse punctures; slightly condensed anteriorolaterally; medially punctation more condensed and becoming rougher; dorsally with rough punctures partly touching each other.

Pronotum strongly convex; disc rarely with slight, small, rounded foveae. Pronotum widest near basal angles; anterior margin nearly straight; pronotal sides slightly, irregularly arcuate; posterior margin trisinuate with feeble lateral and rather deep medial (prescutellar) emarginations. Pronotal disc with small, irregular, sparse punctures; lateral surface with rather dense and large, flat, partly rasp-shaped punctures in places; punctures near anterior angles fused into irregular sinuous, transverse, oblique wrinkles. Sides approximately at middle with short strip of short, yellow setae and white spot. Scutellum large; dorsally convex; apically flattened or slightly depressed; with narrow strip of small, dense punctures and short, yellow setae along anterior margin.

Elytra moderately elongate, slightly narrowed apically; convex, flattened or slightly depressed (in holotype) near scutellum and along suture in posterior 1/3; suture anteriorly nearly flat, postriorly slightly convex; sutural angles slightly produced. Presutural depression bordered laterally with slightly separated costae smoothly continued towards humeral tubercles. Prescutellar portion, costae, apical tubercles of elytra with sparse, small punctures; presutural depression with 3 doubled longitudinal striae and longitudinal rows of distinct, flat, circular and semi-circular wrinkles; remaining surface of elytra with dense, partly fused, arc-shaped wrinkles bearing small, rounded punctures. Elytral pattern absent or slightly developed, when developed (in holotype and some paratypes) consists from few small spots including short, arc-shaped spots near middle and apical areas of elytral sides and with a few rounded spots behind apical tubercles.



FIGURES 1–9. *Protaetia* (*Potosia*) species. 1, 2—*Protaetia haiastanica* **new species** (paratype, male); 3, 4—*Protaetia jelineki* (Petrovitz, 1981) (holotype, male); 5, 6—*Protaetia caucasica* (Kolenati, 1845), Armenia, Gyumri; 7, 8—*Protaetia splendidula* (Faldermann, 1835),Turkey, Agri; 9—*Protaetia fausti* (Kraatz, 1891) (junior synonym of *P. splendidula*) (holotype, female). 1, 3, 5, 7, 9—habitus, dorsal view; 2, 4, 6, 8—habitus, ventral view.
Photography by: 1, 2, 5-8—J.-L. Alpanseque; 3, 4—J. Hayek; 9—S. Blank & L. Behne.



FIGURES 10–21. *Protaetia* (*Potosia*) species. 10, 14, 18—*Protaetia haiastanica* **new species** (paratype, male 11, 15, 19—*Protaetia jelineki* (Petrovitz, 1981) (Erzurum, male); 12, 16, 20—*Protaetia splendidula* (Faldermann, 1835), Turkey, Agri; 13, 17, 21—*Protaetia caucasica* (Kolenati, 1845), Armenia, Gyumri. 10–13—Mesosternal process and medial portion of metasternum; 14–17—distal portion of aedeagus, dorsally; 18–21—apical portion of aedeagus laterodorsally. Photograph by J.-L. Alpanseque.

Pygidium moderately convex, slightly depressed near anterior angles; with rather rough, twisted transversal and oblique wrinkles and few short setae. Pygidium with few white spots forming two longitudinal rows along middle, sometimes (including in holotype) several spots present laterally of the rows. Frequently pattern absent.

Mesosternal process (Fig. 10) small, rather narrow; with anterior margin more-or-less arcuate, glabrous anteriorly; disc with moderately dense small punctures. Metasternum medially glabrous with a few small punctures, along middle with entire sulcus depressed and widened medially and narrowed and smoothed anteriorly and posteriorly. Laterally metasternum with dense, irregular, twisted wrinkles and with dense and long, yellowish-brown setae. Abdominal sternites along anterior margin with a strip of dense and rough, arc-shaped punctures and

short, yellow setae; terminal sternite with similar structure on almost the entire surface. Sternites 2–4 with transverse white spots near anterior margin laterally, sometimes (including in holotype) also with rounded spots near posterior angles.

Protibiae on outer margin with 3 teeth of which the medial tooth is closer to the anterior tooth. Mesotibiae and metatibiae with short, transverse, tooth-shaped keel behind middle of outer margin, apically with 3 teeth. Metacoxae with the same sculpture and pubescence as metasternum but laterally glabrous and with few rough punctures, with posterior angles protruding into a distinct tooth.

Sexual dimorphism slightly pronounced, terminal sternite in female a bit longer than in male and superficially depressed medially.

Aedeagus as in Figs. 14, 18.

Differential diagnosis. The new species belongs to the *P. cuprea* (Fabricius, 1775) species group (sensu Mikšić 1966a, 1966b) and differs from the majority of species included in the group except *P. jelineki* (Petrovitz, 1981) in the rather wide and massive body, the slightly convex elytral suture, and the slightly pronounced presutural depressions, which is more distinct in other species. The closest species, *P. jelineki* (known to us from the photograph of the male holotype from NMPC labeled: Türkei. Ost-Anatolien, Kandilli, 1720m, 18.VI.1970, Leg. J. Jelinek, (Figs. 3–4) and from a series of specimens from Erzurum, close to the type locality) differs from the new species by the body slightly narrower and shinier (Fig. 3), by the dorsal structure being thinner, by larger and wider mesosternal process being nearly straight and truncate anteriorly (Fig. 11), by the absence of depressions and white patterns on the pygidium, and by the structure of the aedeagus (see Figs. 15–16). The new species is also similar to *P. caucasica* (Kolenati, 1845) (Figs. 5–6) and *P. splendidula* (Faldermann, 1835) (Figs. 7–8). *Protaetia splendidula* is generally similar to the new species in coloration and slightly developed white pattern, but differs in the body being narrower caudally and by the less convex pronotum (Fig. 7). *Protaetia caucasica* differs by having a distinct and more developed pattern on the dorsal surface with the elytra bearing bright, transverse stripes and numerous spots. The pronotum also has a more developed pattern and usually has a more-or-less pronounced, white lateral edge. *Protaetia caucasica* is characterized by a wide range of color variation. Both species distinctly differ in the structure of aedeagus (see Figs. 16–17, 20–21).

Distribution. The new species is distributed in northwestern and central Armenia (Shirak plateau, Pambak range, slopes of mountains surrounding Ararat valley) and southwestern Georgia (Borzhomi).

Life history. *Protaetia haiastanica* inhabits southern mountain slopes from 1500–1900 m. It occurs in dry mountain steppe and phrygana habitats with thistles (*Onopordum* sp.), on which the beetles are found. Sometimes this species is found on on *Crambe* sp. Flight is from the end of May until mid-July. This rare species co-occurrs in low numbers with the much more abundant species *P. caucasica*, *P. funebris* (Gory & Percheron, 1833), and *P. hungarica armeniaca* (Menetries, 1832).

Etymology. Named after original name of Armenia—"Haiastan", the country from where the majority of the types originated.

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