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Review of the genus *Protaetiomorpha* Miksic, 1968 (Coleoptera: Scarabaeidae: Cetoniinae)

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Abstract. Representatives of the genus *Protaetiomorpha* Miksic, 1968 are studied. Study of the type localities of historically described species and their distribution, including distribution of species newly described here, revealed, that the genus is endemic to Sulawesi Island (Indonesia). Generic relation to *Glycyphana* Burmeister, 1842 and *Protaetia* Burmeister, 1842 is briefly discussed. Two new species are described, illustrated and compared with currently known species; *Protaetiomorpha puncak* sp. nov. from Puncak Palopo Pass and *Protaetiomorpha seko* sp. nov. from Seko District, both occurring in the western-central part of the island.

INTRODUCTION

Protaetiomorpha was established by Mikšič in 1968 as a subgenus of *Glycyphana* Burmeister, 1842. The structure of the metacoxae, which are not touching each other, led the same author to consider it as a valid genus (Miksic, 1979). After this publication all authors follow Miksic's concept. Habitually species of *Protaetiomorpha* look similar to some representatives in genus *Protaetia* Burmeister, 1842 and the only character used for separation is the different shape of the mesometasternal process, which is more rounded, without the typical apical plate developed in *Protaetia* species. The shape of the apex of the mesometasternal process in *Protaetiomorpha* is more rounded and globular-shaped. In all other characters (including male aedeagi) both genera remain very close, therefore the taxonomic position of *Protaetiomorpha* remains questionable.

Currently, the genus accomodates only two species, both occurring in Sulawesi. *Protaetiomorpha felina* was described by Gory & Percheron in 1833 from Nouvelle-Hollande. This distribution leads to some confusion mentioned by Lea (1914), supported by an error in Burmeister's monograph (1842), where the author listed species from Amboina (Moluccas, Indonesia). This error in distribution of the species was followed by many authors after Burmeister (1842). Unfortunately the type was not found, but a rather good illustration in Gory & Percheron, 1833 shows that it is an insect flying in the northern part of Sulawesi Island, in Minahassa Province. Another supporting fact for this conclusion is that there were very few specimens, if any, collected in other parts of Sulawesi than in Minahassa during early of 19 th century.

The second species descibed in the same genus is *Protaetiomorpha inornata* Heller, 1898. The species was described from single female collected in Mount Lampobattang

occurring in the southern part of Sulawesi. The type should be housed in Heller's collection in Dresden (Germany), but the author was not able to find it. Also Mikšič (1979, 1982) gives only the original description of Heller (1898). According to original description, the species is completely immaculate and its body size is larger than the type species. The status of this species is unclear, according to Heller's description it may also belong to *Netociomima* Miksic, 1963 or *Pseudourbania* Miksic, 1965.

In all institutions and private collections representatives of *Protaetiomorpha* Miksic, 1968 are identified as *Protaetiomorpha felina* (Gory & Percheron, 1833). During the examination of specimens the author of this article noticed that populations occuring in the northern part of Sulawesi (Minahassa Province) and in other parts of the island are not conspecific, but differ in several morphological characters, including male aedeagi. It is known that a large part of cetoniine beetles described from the northern part do not occur in the central and southern part of the island, for example several *Pseudomecinonota* Miksic, 1972 and also *Protaetia* Burmeister, 1842 species. All specimens examined by the author from the central and central-western parts of Sulawesi belong to different, undesribed species and all specimens examined by the author from Minahassa and Gorontalo (northern parts of Sulawesi) belong to *Protaetiomorpha felina* (Gory & Percheron, 1833). Illustrations of Mikšič (1979, 1982) belong to *P. felina* (Gory & Percheron, 1833), while the illustration in the iconography of Sakai & Nagai, 1998 (2 males) belongs to a new species, which is described below. Most of the specimens collected in the last few decades originate from the central and central-western parts of the island and are present in many institutions and especially private collections. Besides the new species flying in Puncak Palopo Pass and Palolo area, the author received one male from the Seko district also in the central-western part of the island. This species shows even greater morphological differences than can be found between *Protaetiomorpha felina* (Gory & Percheron, 1833) and its congener from Puncak Palopo Pass and Palolo area. This species is also described as a new for science in taxonomic part of this study.

MATERIAL AND METHODS

The following codens of institutional and private collections are used in the text:

SJCP Stanislav Jákl private collection, Praha, Czech Republic;
SMTD Staatliches Museum fur Tierkunde, Dresden, Germany.

Specimens of newly described species are provided with red and yellow printed labels, red for HOLOTYPUS, yellow for PARATYPUS. Each holotype or paratype label is provided with sex symbol, number of paratype (in paratype label) and words St. Jákl det. Label data are cited for the material examined, individual labels are indicated by a double slash (//), individual lines by a single slash (/).

RESULTS

Genus *Protaetiomorpha* Miksic, 1968

Glycyphana (*Protaetiomorpha*) Miksic, 1968: 138 (key to subgenera, designation of new subgenus and type species); 1970: 16 (revision of *Glycyphana* Burmeister, 1842).

Protaetiomorpha Miksic: Mikšič1979: 229 (key to genera of Palearctic and Oriental Cetoniini, new rang), : 220 (diagnosis), : 239, fig. 2a (mesometasternal process); 1982 : 145 (monograph), : 11 (key to genera); Krikken 1984: 57 (suprageneric taxa of Cetoniidae); Krajčík 1998: 48 (catalogue); Sakai & Nagai, 1998: 261 (iconography).
type species *Cetonia felina* Gory & Percheron, 1833 (designated by Miksic, 1968: 140).

Taxonomic key to species of the genus *Protaetiomorpha* Miksic, 1968

1 (6) Dorsum with numerous white or yellow maculae.
2 (3) Coloration reddish, margins of elytra, part of elytral disc and pronotal disc black. Ornament white. Apex of mesometasternal process obtusely rounded. Protibia of male bidentate. Species from central-western part of Sulawesi .....*Protaetiomorpha seko* sp. nov.
2 (3) Coloration black, brown or plum brown. Black parts of pronotum and elytra (in brownish specimens) not developed. Ornament white or yellow. Apex of mesometasternal process pointed. Protibia of females tridentate, in males also tridentate but in some male specimens posterior tooth reduced.
4 (5) Head, pronotum and elytra black. Dorsal ornament white to ochre. Pronotum and anterior half of elytra with much smaller maculae than maculae in posterior elytral half. Inner rim of male parameres distinctly visible. Species from northern part of Sulawesi (Minahassa) .....*Protaetiomorpha felina* (Gory & Percheron, 1833)
5 (4) Head, pronotum and elytra black, dark brown, brown, plum brown to reddish. Dorsal ornament white or yellow to canary yellow. Male parameres short and wide, outer rim of paramere nearly invisible. Species from central and southern part of Sulawesi..... *Protaetiomorpha puncak* sp. nov.
6 (1) Dorsum immaculate, coloration black. Species from southern part of Sulawesi (Mt. Lampobattang) ....*Protaetiomorpha inornata* (Heller, 1898)

Note. Females of *Protaetiomorpha inornata* (Heller, 1898) and *Protaetiomorpha seko* sp. nov. are unknown. The status of *Protaetiomorpha inornata* (Heller, 1898) is rather quesionable, and according to the description, it may belong to a different subgenus. Unfortunately since Miksic's time the type has not been found.

Protaetiomorpha felina (Gory & Percheron, 1833)
(Figs. 1-5)

Cetonia felina Gory & Percheron, 1833: 63, tab. 52, fig. 4 (original description); Burmeister 1842: 795 (monograph); Lea 1914: 213 (species doubtfully or wrongly recorded as australian).
Glycyphana felina (Gory & Percheron): Schenkling 1921: 273 (catalogue).
Glycyphana (*Protaetiomorpha*) *felina* (Gory & Percheron): Mikšič 1968: 140 (assigment to new subgenus); 1970: 17 (key to species of subgenus *Protaetiomorpha*, revision of *Glycyphana*): 18 , figs. 2-4 (habitus, aedeagus, mesometasternal process).
Protaetiomorpha felina (Gory & Percheron): Mikšič1979: 229 (mention, type species); 1982: 146 (key to species), : 146, figs. 23A-C (habitus, aedeagus, mesometasternal process); Sakai & Nagai 1998: 261, pl. 79, fig. 847-1 (male, Puncak Palopo), fig. 847-2 (male, Puncak Palopo); Krajčík 1998: 48 (catalogue).

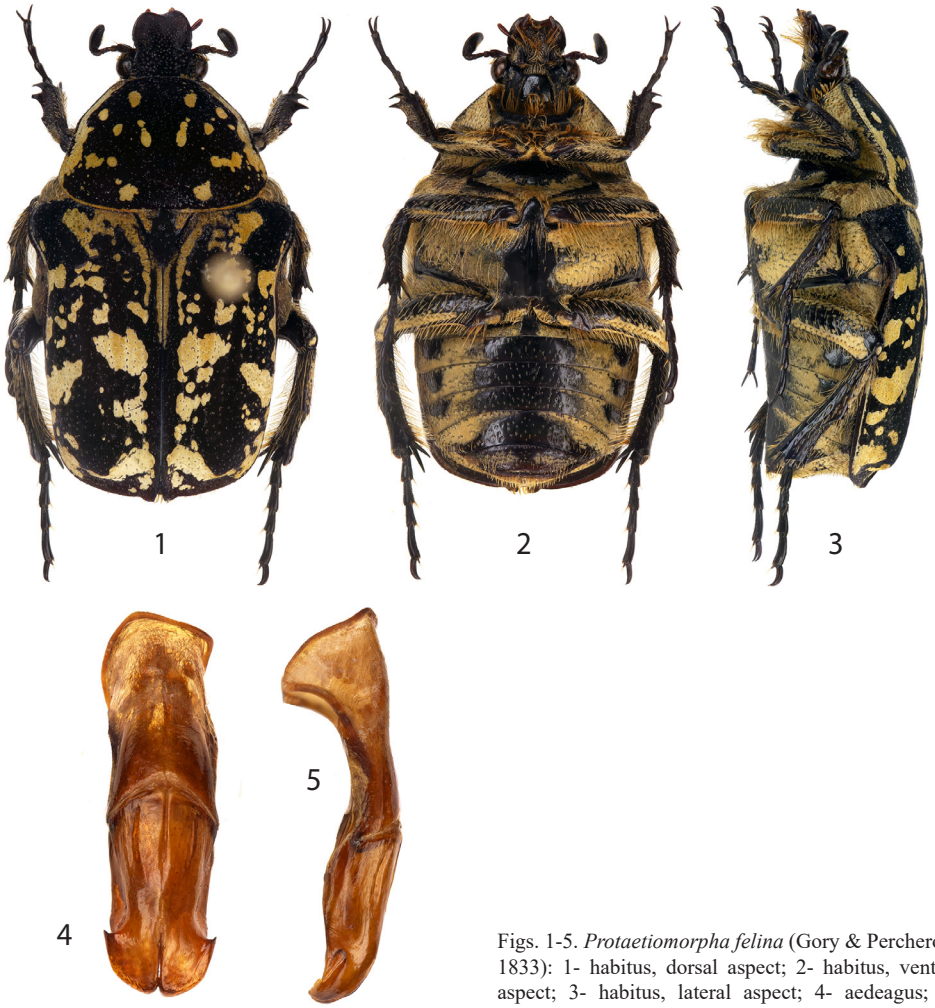
Type locality. "De la Nouvelle-Hollande".

Type material. Not located.

Additional material examined: 1 ♂ (SJCP) labelled: Marawas-Manado / N. SULAWESI / MAY, 2000; 2 ♂♂, 1 ♀ (SJCP) labelled: N. Celebes, 4. / TONDANO, 1998.

Distribution. Indonesia: North Sulawesi, Minahassa Province.

Note. Both males illustrated in Sakai & Nagai (1998) belong to *Protaetiomorha puncak* sp. nov.



Figs. 1-5. *Protaetiomorpha felina* (Gory & Percheron, 1833): 1- habitus, dorsal aspect; 2- habitus, ventral aspect; 3- habitus, lateral aspect; 4- aedeagus; 5- aedeagus, lateral aspect.

Protaetiomorpha inornata (Heller, 1898)

Glycyphana inornata Heller, 1898: 26, fig. 14 (original description); Schenkling 1921: 274 (catalogue).
Glycyphana (*Protaetiomorpha*) *inornata* Heller: Mikšič 1968: 140 (asighment to new subgenus); 1970: 22 (revision of Glycyphana), : 17 (key to species of subgenus Protaetiomorpha); 1982 : 149.
Protaetiomorpha inornata (Heller): Mikšič 1979: 221 (Palearctical and Oriental genera of Cetoniini, new rang); Krajčík 1998: 48 (catalogue).

Type locality. "S Celebes Indrulaman Mons. Bonthain" (= Indonesia, south Sulawesi, Mt. Lampobattang, Indrulaman).

Type material. Not located.

Additional material examined. None.

Distribution. Indonesia: south Sulawesi.

Note. The status of this species remains questionable. The author was not able to examine the holotype. According to the description this species might belong to the subgenus *Pseudourbania* Miksic, 1965 or *Netociomima* Miksic, 1963.

Protaetiomorpha puncak sp. nov.
(Figs. 6-10)

Type locality. Indonesia, Central-Western Sulawesi, Puncak Palopo Pass.

Type material. Holotype (♂) (SJCP) labelled: Indonesia, C. Sulawesi / PUNCAK PALOPO / V. 2007 / local collectors lgt. Paratypes (Nos. 1-2 ♂♂) (SJCP) labelled: INDONESIA / Sulawesi centr. / Puncak – Palopo/ 4.-5. 1999 / native collectors lgt.; (Nos. 3-9 ♂♂, No. 10 ♀) (SJCP) labelled: Ind. Sulawesi centr. / PUNCAK PALOPO / Loc. Col.; (No. 11 ♂) (SJCP) labelled: Indonesia, Sulawesi / Puncak Palopo / IX. 2017 / local collector leg.; (No. 12 ♂) (SJCP) labelled: same as holotype.

Description of holotype. Black to purple brownish, all parts of both body sides decorated with abundant, yellow ornamentation. Body size (excluding pygidium) 15.2 mm.

Head. Black, base of frons and base of clypeus with pair of yellow patches. Punctation medially dense, on clypeus distinctly denser, but with smaller diameters of punctures. Apex of clypeus moderately emarginated, obtusely bordered. Antennal club brown, stalk black. Club slightly shorter than stalk.

Pronotum. Dark brown, posterolateral angles and base paler. Pronotal punctation sparser and finer than on head. Anterior half of sides with low and very narrow border and yellow vitta at each side. Remainder of pronotum with several irregularly shaped and sized yellow patches of ornament. Setation very sparse, present only on sides.

Scutellum. Coloration plum brownish, impunctate and immaculate. Triangularly shaped with obtusely rounded apex.

Elytra. Brownish to purple brown, decorated with numerous, yellow patches, which are irregularly shaped, differently sized, present on both elytral halves. Punctation fine and shallow. Disc of each elytron with four indistinctly developed and more or less only

fragmentally running striolate lines. Subscutellar area impunctate. Sides with rather sparse horse-shoe shaped punctures. Apex with thin and shallow striolation. Sutural ridge flat, its apical fourth slightly and obtusely elevated. Both elytral calli nearly flat. Subhumeral emargination rather shallow. Setation reduced to only few short setae on apex.

Pygidium. Brown to purple brown, almost entire surface with cover of yellowish ornament, leaving dark only small part of pygidial disc and two small parts beside sides. Yellowish setation short, but rather dense.

Ventrum. Except abdominal disc, metasternal plate and part of prosternum, with cover of yellowish ornament. Ventrites with 2-4 horisontally running rows of punctures bearing setae. Metasternum and prosternum moderately striolated. Mesepimeron and metepimeron completely covered with yellow ornament. Mesometasternal process short, its apex rather sharply pointed. Metasternal sides and part of prosternum with rather dense, yellow setation. Abdominal setation distinctly shorter and much sparser than setation on femora and metasternal sides.

Legs. Black, rather short. Femora with cover of yellow ornament. Protibia tridentate, teeth not equidistant. Meso- and metatibia with carina on posterior half and rather long and dense setation on inner sides.

Genitalia. Parameres short, sides nearly parallel. Outer rim in front of apex with hook protruding backwards (Figs. 9-10).

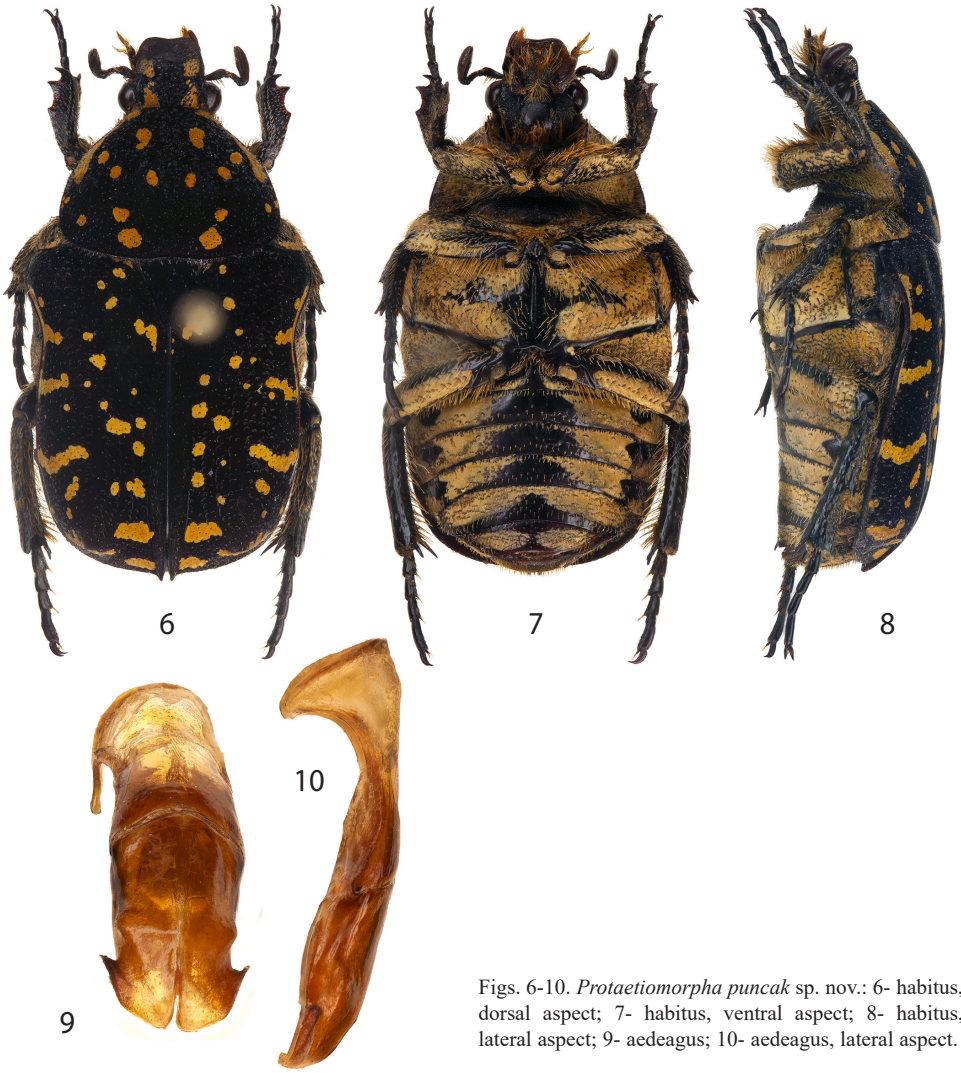
Variability. Coloration of dorsum black, brown to purple brownish. Body size ranging from 14.2 to 15.4 mm (excluding pygidium). Yellow ornament different in each specimen, especially the maculation of the elytra ranging from rather sparse to abundant.

Sexual dimorphism. Size of single female available for study 15.4 mm. Coloration of head black, elytra and pronotum brownish. Yellow ornament similarly developed as in males. Apex of clypeus more elevated than in males. Punctation of head deeper and denser. Protibia wider, more robust, tridentate, teeth equidistant. Abdomen arched, its yellow ornament present only on lateral margins. Anal ventrite rugosely punctured.

Differential diagnosis. *Protaetiomorpha puncak* sp. nov. differs from *Protaetiomorpha felina* (Gory & Percheron, 1833) in a complex of the following characters: I. Dorsal coloration black in historically described species, but usually brown to purple brown in new species (but some specimens also black); II. Dorsal and ventral ornament white to ochre in known species, but light to dark yellow in new species; III. Pattern of dorsal ornament, specially in elytra differently composed; IV. Incision of clypeal apex deeper in known species; V. Subhumeral emargination of elytra slightly sharper in historically described species; VI. Ventral setation, specially in metasternum distinctly longer in known species; VII. Apex of mesometasternal process longer and more parallel in *Protaetiomorpha felina* (Gory & Percheron, 1833), but shorter and with pointed apex in newly described species; VIII. Male aedeagi differ in position of apical hook and ratio between parameral width and length, in new species male paramere distinctly shorter and wider than in its congener (Figs. 9-10).

Etymology. Named after Puncak Palopo Pass, type locality of newly described species.

Distribution. Indonesia: Sulawesi Island.



Figs. 6-10. *Protaetiomorpha puncak* sp. nov.: 6- habitus, dorsal aspect; 7- habitus, ventral aspect; 8- habitus, lateral aspect; 9- aedeagus; 10- aedeagus, lateral aspect.

***Protaetiomorpha seko* sp. nov.**
(Figs. 11-15)

Type locality. Indonesia, Sulawesi, Seko.

Type material. Holotype (♂) (SJCP) labelled: Indonesia, S. Sulawesi prov. / SEKO ENV., 4. 2002 / Local collector.

Description of holotype. Light brown with black head, pronotal disc, part of elytral disc, lateral margins of elytra and elytral apex. Pronotum and elytra decorated with numerous

smaller and larger, white patches of ornament. Body size 15.3 mm (excluding pygidium).

Head. Black, immaculate. Punctation fine and sparse. Apex of clypeus gently emarginated. Frons with moderately long setation, specially on sides. Antennal club brown, stalk black. Antennal club slightly shorter than stalk.

Pronotum. Pronotal disc blackish, remainder pale brown. Disc with numerous white patches, rather irregularly shaped and composed. Anterior half of sides with uninterrupted white vitta, which is fragmentally present also on posterior half of sides. Punctation horse-shoe shaped on anterior pronotal half and sides, remainder of pronotum with more simple, fine punctures. Setation absent.

Scutellum. Coloration brownish, triangularly shaped, impunctate and immaculate throughout total length.

Elytra. All margins and part of disc on anterior elytral half blackish, remainder brownish to reddish. Numerous white patches differently sized and irregularly shaped present throughout total length. Posterior thirds of lateral margins and entire apex with cover of white tomentum. Disc of each elytron with five rather short and shalow longitudinally running striolate lines. Rather sparse horse-shoe shaped punctation present mainly on sides and elytral apex. Lateral border reaching approximately level of apical calli. Humeral calli flat, calli on apex more developed, but rather obtuse. Apical margin with few short, white setae. Sutural ridge flat, on front of level of apical calli slightly elevated and rather sharp, but not drawn out over elytral apex.

Pygidium. Black, disc with two longitudinally running and slightly semioval-shaped, white vittae. Moderately long and rather dense light yellow setation present throughout total length.

Ventrum. Black, moderately shining. Sides of abdominal segments, metacoxae, sides of metasternum, entire mesepimeron and metepimeron and part of prosternum with cover of white ornament. Metasternal plate with two smaller white patches of ornament. Abdominal impression not developed. Black part of abdomen and metasternum nearly impunctate. Abdominal sides and sides of metasternum and also mesepimeron, metepimeron, metacoxae and prosternum setose. Mesometasternal process short, but slightly longer than wide, running in parallel, its apex obtusely rounded.

Legs. Medially long, completely black. Femora with rather long white setation, tibial setation slightly shorter and sparser. Protibia bidentate, entire upper surface of protibia with large punctures filled with whitish ornament. Meso- and metatibia with moderately sharp carina on posterior half.

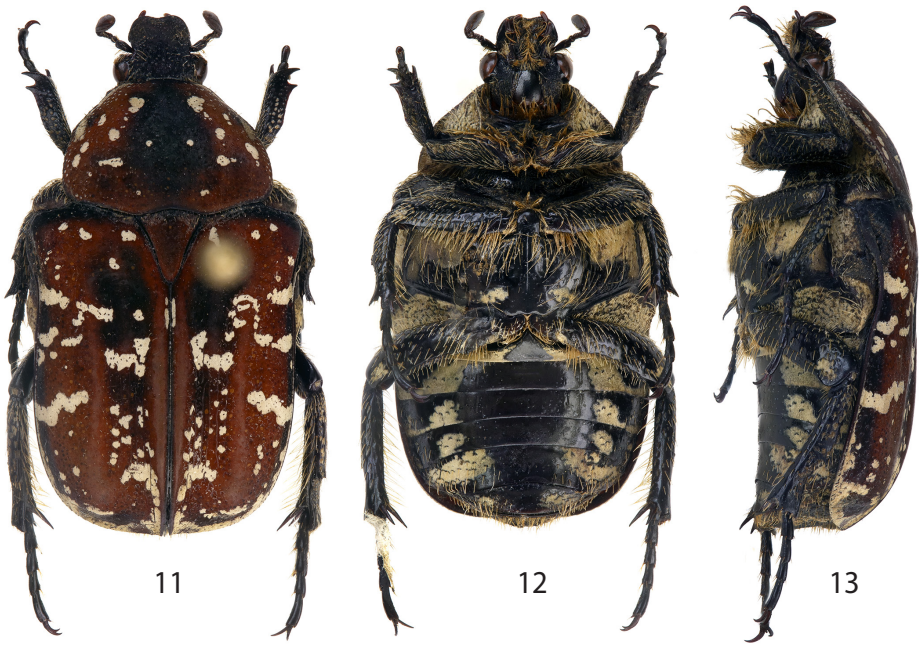
Variability and sexual dimorphism. Hitherto only the holotype male is known.

Differential diagnosis. *Protaetiomorpha seko* sp. nov. differs from all its congeners by a complex of the following characters: immaculate head with fine punctation; apical border of clypeus not developed; dorsal and ventral coloration white; coloration light brown to reddish with black part of pronotal disc, black part of anterior half of elytral disc and black all elytral margins; abdominal punctation very fine and sparse; disc of elytron with striolate lines; mesometasternal process paralel, developed with obtusely rounded apex; protibia bidentate.

Male parameres of newly described species longer, outer rim much broader, on apex only with small dent, without sharply developed hook protruding backwards (Figs. 14-15).

Etymology. Named after Seko District in central- western part of Sulawesi Island.

Distribution. Indonesia, Sulawesi.



Figs. 11-15. *Protaetiomorpha seko* sp. nov.: 11- habitus, dorsal aspect; 12- habitus, ventral aspect; 13- habitus, lateral aspect; 14- aedeagus; 15- aedeagus, lateral aspect.

Note. In Krajčík's catalogue (1998) the name *Protaetiomorpha flavovariegata* (Mohnike, 1973) appears. It was never listed in *Protaetiomorpha* Miksic, 1968 nor by Miksic or by any other author.The species described from Luzon (Philippines) is currently placed in species incertae sedis due to the absence of Mohnike's type. Most authors historically considered that species belongs to *Protaetia* Burmeister, 1842.

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