

Taxonomical notes about the *Taeniodera monacha* Gory & Percheron species group (Coleoptera: Scarabaeidae: Cetoniinae)

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Abstract. *Taeniodera monacha* Gory & Percheron, 1833 species group is studied. *Taeniodera monacha modesta* Schoch, 1898 is raised to the species level. *Taeniodera monacha sumatrana* Mikšič, 1976 is considered as a subspecies of *Taeniodera modesta* Schoch, 1898 here occurring in Sumatra Island, Singapore, Malay Peninsula and Thailand. *Taeniodera monacha nigra* Jákl, 2011 is raised to the species level. *Taeniodera longipennis* sp. nov. is described from southern part of Vietnam. All species are compared, diagnosed and illustrated and a key to male and female specimens is provided.

INTRODUCTION

Taeniodera monacha Gory & Percheron, 1833 is together with *Taeniodera egregia* Gory & Percheron, 1833 and *Taeniodera anthracina* Gory & Percheron, 1833 one of oldest described representatives of the genus, excepting only *Taeniodera haematica* described two years earlier by Perty in 1831. Excepting *T. monacha* Gory & Percheron, 1833, exerting a wider distribution, other latter mentioned species occur only in Java Island. Although the type locality of *Taeniodera monacha* Gory & Percheron, 1833 stays unclear, it is generally accepted to consider Java as a type locality of the species, mainly due to fact that all other *Taeniodera* species described by Gory & Percheron in 1833 also come from Java Island.

Three zoogeographical subspecies of *T. monacha* Gory & Percheron are currently recognised, *Taeniodera monacha modesta* Schoch, 1898 from Kalimantan and Laut Island, *Taeniodera monacha sumatrana* Mikšič, 1976 from Sumatra, Singapore and Peninsular Malaysia and *Taeniodera monacha nigra* Jákl, 2011 from Siberut Island in Mentawai Archipelago. In this study, all mentioned taxa are studied based on rather rich material and results are presented in the taxonomical part of this work.

Mikšič (1976) accommodated *Taeniodera monacha* Gory & Percheron, 1833 into the *Taeniodera egregia* Gory & Percheron species group. In author's opinion other species stay morphologically rather far and *T. monacha* Gory & Percheron deserves to have its own, different species group.

MATERIAL AND METHODS

The following codens of institutional and private collections are used in the text:
BMNH British Museum Natural History, London, United Kingdom;
MNHN Muséum National d'Histoire Naturelle, Paris, France;

NMPC National Museum, Praha, Czech Republic;

SJCP Stanislav Jákl private collection, Praha, Czech Republic.

Specimens of newly described species are provided with red and yellow 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

Taeniodera monacha (Gory & Percheron, 1833)

(Figs. 1-5)

Macronota monacha Gory & Percheron, 1833: 323, pl. 64, fig. 1 (original description); Wallace, 1868: 557 (catalogue); Schenkling, 1921: 140 (catalogue).

Taeniodera monacha (Gory & Percheron): Burmeister, 1842: 326 (monograph); Schoch, 1894: 182; Sakai & Nagai, 1998: 344, pl. figs. 1516 - 1 (male, Java) [iconography].

Taeniodera monacha (Gory & Percheron): Mikšič, 1976: 51 (key), 57, fig. 10b, 17b (parameres) [monograph]; 1980: 363 (Malakka-Perak); Krajčák, 1998: 94 (catalogue).

Macronota luxeri Buquet, 1836: 204 (original description).

Taeniodera luxeri (Buquet): Burmeister, 1842 (= *T. monacha* Gory & Percheron, 1833); Type locality. Java. Type material. Not traced.

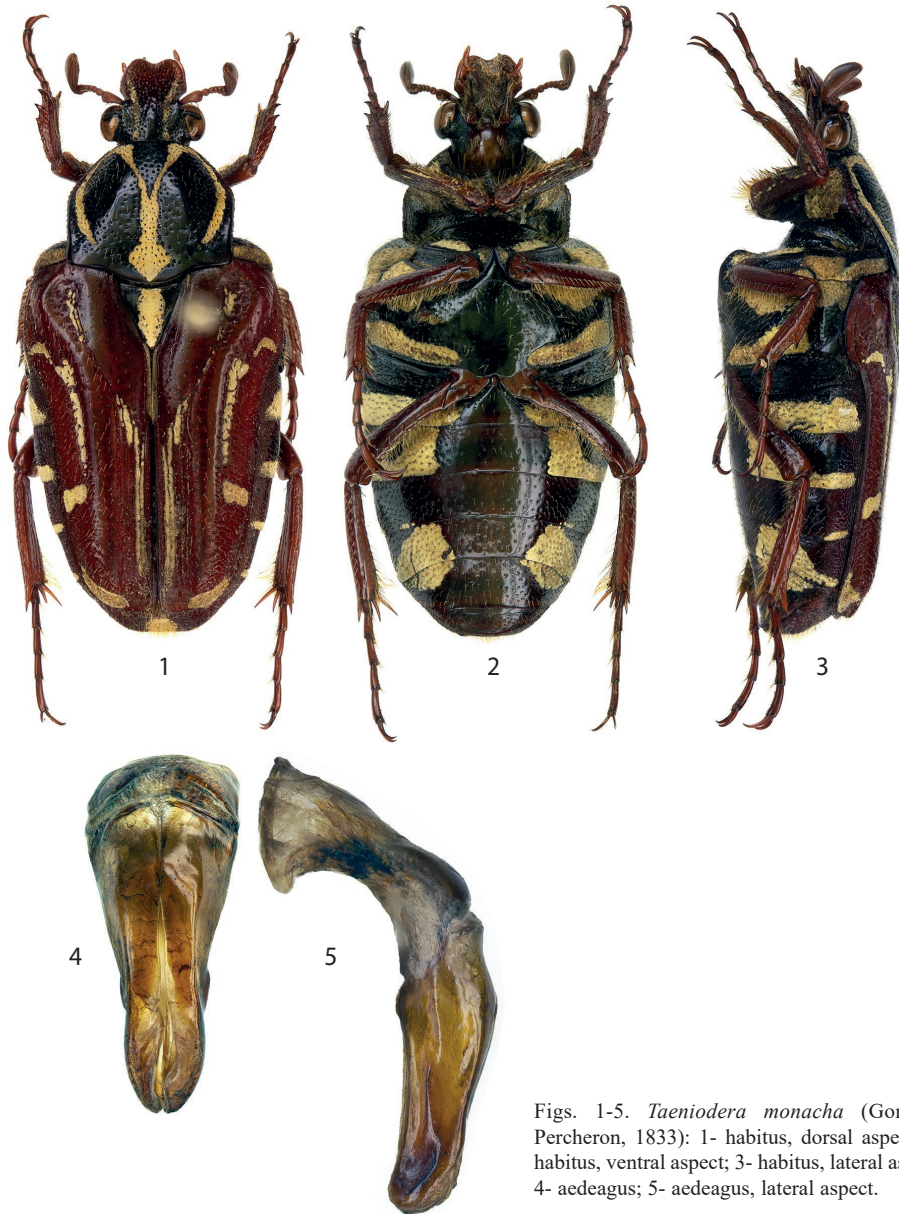
Type locality. „Indes orientales“ (= East India).

Type material. Not traced.

Additional material examined: 10 ♂♂, 10 ♀♀ (SJCP) labelled: Indonesia, East Java Prov. / MT. ARGOPURO, Bermi vill. env. / 1200 m alt., XII. 2008, local collector leg; 1 ♀ (SJCP) labelled: INDONESIA, E Java / JEMBER reg. / XII. 2004 / local collector leg; 2 ♂♂, 1 ♀ (SJCP) labelled: INDONESIA, East Java / Prov., ARGOPURO MTS. / Bermi vill. env., 1200 m / XII. 1999, local collector.

Differential diagnosis. *Taeniodera monacha* Gory & Percheron, 1833 differs from all other representatives in the same species group in the following aspects: I. Pronotum and sometimes subscutellar part of elytra black, shining, missing cover of basic tomentum, but with tomentum in all congeners; II. Bicolored dorsum with black pronotum and reddish elytra, but more or less unicolored in other species; III. Yellowish dorsal and especially ventral ornament sparser than in all congeners; IV. Male parameres differently structured than in all other species.

Distribution. Indonesia: Java Island.



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

***Taeniodera modesta* Schoch, 1898 stat. nov.**

(Figs. 6-10)

Taeniodera modesta Schoch, 1898: 73 (original description).

Macronota modesta (Schoch): Schenkling, 1921: 140 (catalogue).

Taeniodera monacha modesta Schoch: Mikšič, 1976: 61 (monograph), 51 (key); Krajčik, 1998: 94 (catalogue); Legrand & Chew Kea Foo, 2010: 66, photo 186 (typical form), photo 187 (variation) [Cetoniidae of Sabah].

Taeniodera monacha (Gory & Percheron): Sakai & Nagai, 1998: 344, pl. 129, figs. 1516 - 2, 3, 4 (males, Borneo), 1516 - 5 (female, Borneo), 1516 - 6 (male, Laut Island), 1516 - 7 (female, Laut Island) [iconography].

Type locality. „Nordborneo“ (= Malaysia, North Borneo).

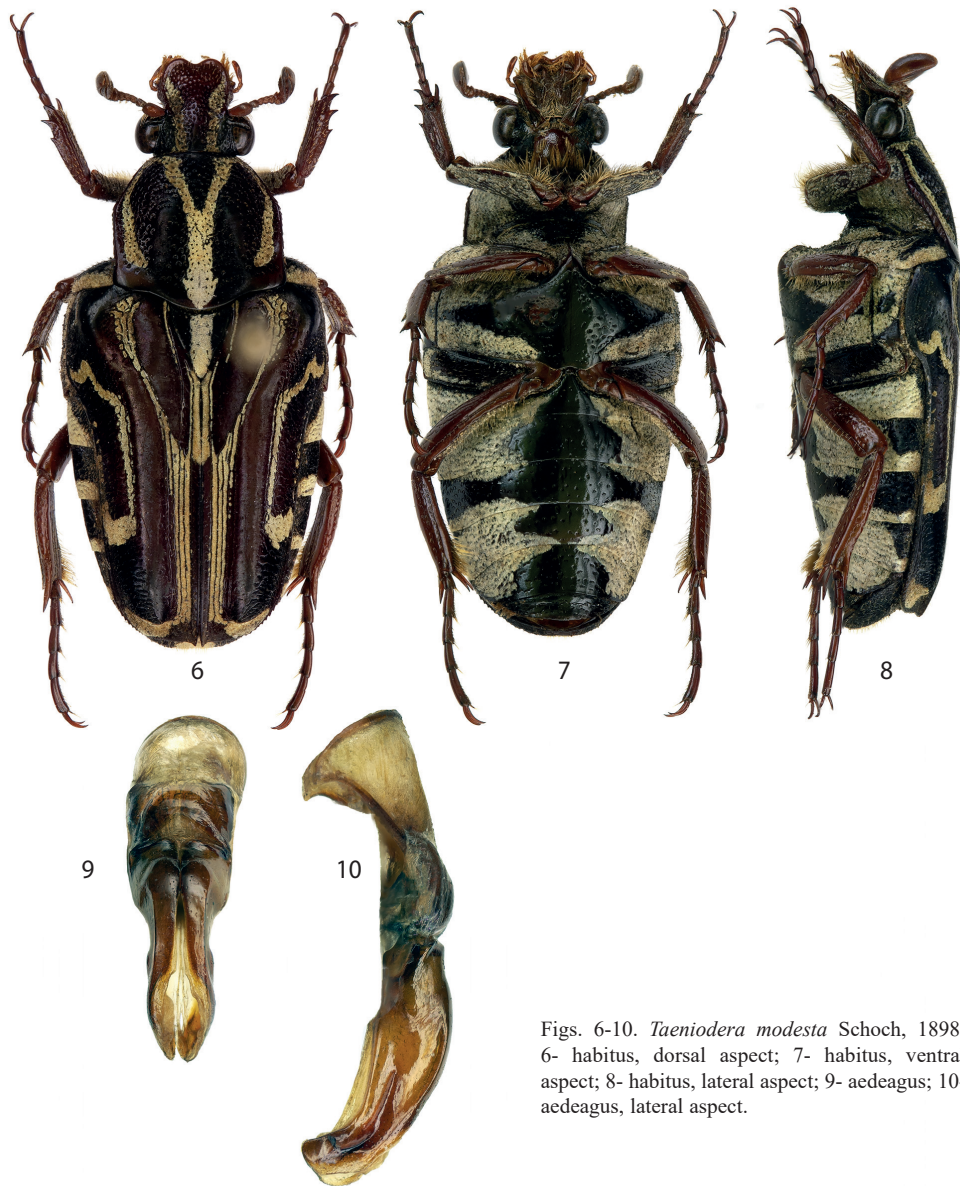
Type material. Not traced.

Additional material examined: 1 ♂, 1 ♀ (SJCP) labelled: Sarawak, Kapit distr. / Rumah ugap vill. / Sut. Riv. 3.-9.3. 1994 / Sv. Bílý leg; 1 ♂ (SJCP) labelled: Ind., S Kalimantan prov. / Kandangan distr., 900 m / LOKSADO 17 km NE / 23.9. - 30.10. 97, St. Jakl lgt; 2 ♂♂, 5 ♀♀ (SJCP) labelled: Indonesia, C kalimantan / MT. PAYANG, 800-1200 m / 3. 2008, local collector leg; 1 ♂ (SJCP) labelled: INDONESIA, S Kalimantan / SUMPOL / II. 2008 / local collector leg; 4 ♂♂, 1 ♀ (SJCP) labelled: INDONESIA, W Kalimantan / Pontianak reg., XI. 2011 / MT. AMBAWANG / local collector leg; 2 ♀♀ (SJCP) labelled: Kimanis Rd., 1000 m / Crocker Range / Sabah, N. BORNEO; 1 ♂, 2 ♀♀ (SJCP) labelled: Indonesia, S Kalimantan / Meratus Mts., 3. 2005 / S slopes of MT. BESAR / local collectors lgt; 1 ♀ (SJCP) labelled: C Kalimantan Prov. 60 km / SE Muara Teweh, 150 m / 1.20.25S 115.20.16E / 24.-28.Jun 2001, Bolm lgt; 1 ♂, 1 ♀ (SJCP) labelled: Malaysia, SABAH / Trus Madi, 20.7. 2004 / local collectors lgt.

Differential diagnosis. *Taeniodera modesta* Schoch, 1898 distinctly differs from *Taeniodera monacha* Gory & Percheron, 1833 in following aspects: I. Basic tomentum present, but completely or nearly absent in species from Java; II. Dorsal side opaque, brownish with black parts of pronotum, elytral sides and elytral calli or often completely black, but clearly bicolored, with black and shining pronotum and subscutellar part of elytra and brownish rest of elytra in *T. monacha* Gory & Percheron, 1833; III. Average size smaller in *T. modesta* Schoch, 13.0-15.0 mm, but 14.5-17.5 mm (excluding pygidium) in species from Java; IV. Dorsal and ventral ornament much more expressed in *T. modesta* Schoch than in its congener; V. Aedeagi of males differently structured (Figs. 4-5, 9-10).

Distribution. Malaysia: Borneo; Indonesia: Kalimantan, Laut Island.

Note. The species was described by Schoch from North Borneo. Mikšič in his monograph of Taenioderini (1976) considered Schoch's species only as a subspecies of *Taeniodera monacha* Gory & Percheron, 1833 from Borneo Island. Krajčik (1998) and Legrand & Chew Kea Foo (2010) followed the concept of Mikšič. Sakai & Nagai (1998) refused to classify subspecies of *Taeniodera monacha* Gory & Percheron, 1833 and authors provided us with illustrations of specimens from Java, Borneo, Sumatra, Laut, Natuna and Siberut Islands and all listed under the name *Taeniodera monacha* Gory & Percheron, 1833. Examination of male genitalia and external morphology of insects flying in Java and Borneo revealed that both populations differ more than on subspecies level and therefore, in the present work, there is a proposal to consider the mentioned taxa as two different species.



Figs. 6-10. *Taeniodera modesta* Schoch, 1898:
6- habitus, dorsal aspect; 7- habitus, ventral
aspect; 8- habitus, lateral aspect; 9- aedeagus; 10-
aedeagus, lateral aspect.

Taeniodera modesta sumatrana Mikšič, 1976 stat. nov.

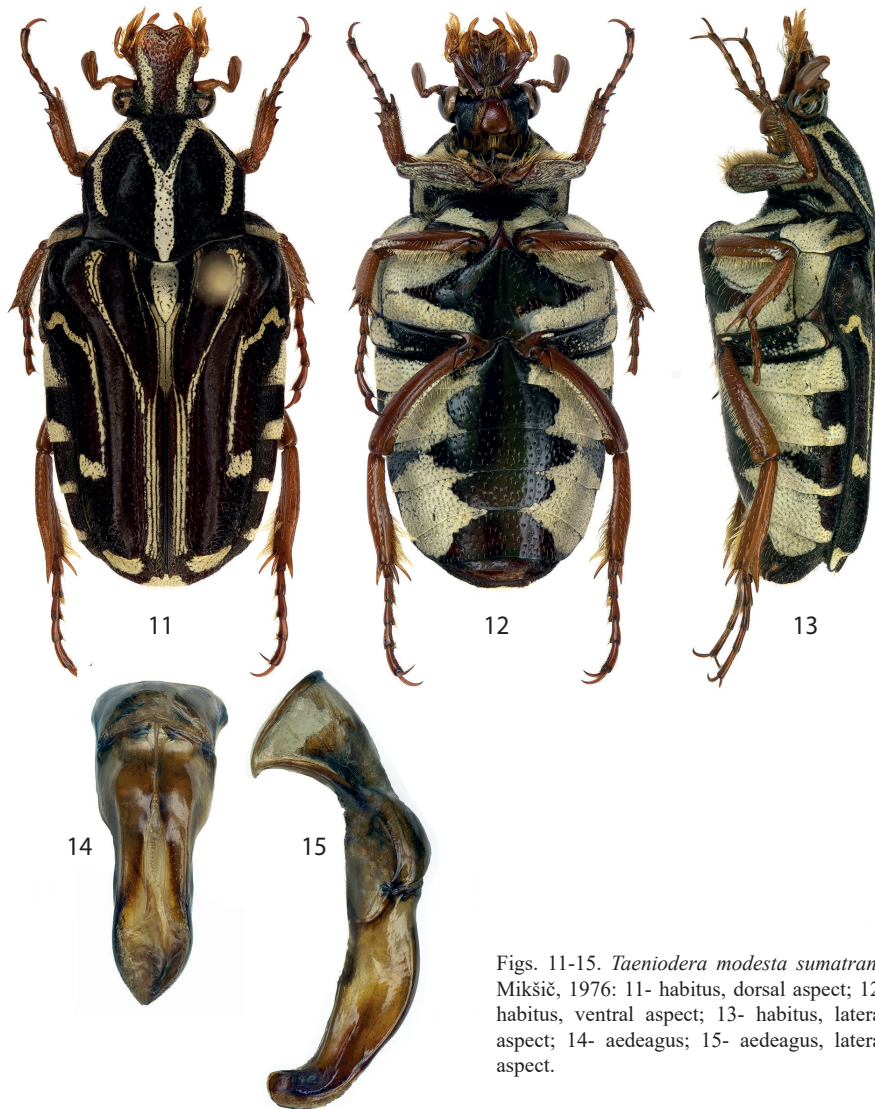
(Figs. 11-15)

Taeniodera monacha sumatrana Mikšič, 1976: 61 (original description); Krajčič, 1998: 94 (catalogue).

Taeniodera monacha (Gory & Percheron): Sakai & Nagai, 1998: 344, pl. 129, fig. 1516 - 10 (male, Sumatra).

Type locality. „West Sumatra, Padang Pandjang“ (= Indonesia, West Sumatra Province, Padang Pandjang).

Type material. Holotype ♂, Allotype ♀ not traced.



Figs. 11-15. *Taeniodera modesta sumatrana* Mikšič, 1976: 11- habitus, dorsal aspect; 12- habitus, ventral aspect; 13- habitus, lateral aspect; 14- aedeagus; 15- aedeagus, lateral aspect.

Additional material examined: 2 ♂♂, 2 ♀♀ (SJCP) labelled: Indonesia, W. Sumatra prov. / ANNAI VALLEY NAT. PARK / 5. 1999, Local collectors; 5 ♂♂, 1 ♀ (SJCP) labelled: Indonesia, W. Sumatra prov. / PAYAKUMBUH REG., 5. 1995 / Local collectors; 1 ♂, 2 ♀♀ (SJCP) labelled: Indonesia, W. Sumatra / Mt. Singgalang, Annai / valley, 5. 2005, 500 m / St. Jákl lgt; 10 ♂♂, 8 ♀♀ (SJCP) labelled: I.-W. Sumatra / 5.-10.2. / Payakumbuh, 1991 / Harau, 1000 m / St. Jákl lgt; 2 ♂♂, 2 ♀♀ (SJCP) labelled: Indonesia / W. Sumatra prov. / Mt. Kerinci, V. 99 / native collectors; 5 ♂♂, 3 ♀♀ (SJCP) labelled: I.-W. Sumatra / Payakumbuh / Sarilamak env. / St. Jákl lgt, 1991; 6 ♂♂ (SJCP) labelled: INDONESIA, West / Sumatra Pr., 1200 m / MT. SANGGUL, IX.2012 / Landai vill. env. / local collector leg; 1 ♂ (SJCP) labelled: Thailand, Pha To env. / Champhon prov. / 27.3.-14.4. 1996, Prúdek lgt.

Differential diagnosis. Population from Sumatra, Singapore, Malay Peninsula and Thailand differs from population flying in Borneo in uniform coloration of body, which is usually reddish to chestnut brown, rarely dark brown, sometimes with blackish elytral calli and part of pronotum. In nominotypical subspecies usually dorsal side brownish with larger blackened parts, especially in elytral calli, elytral sides and pronotum, sometimes completely black or black with small brownish part in elytral disc. Legs always reddish to brownish in subspecies from Sumatra, but darker brown or sometimes black in subspecies from Borneo. Ochre to yellowish dorsal ornament more developed in nominotypical subspecies, especially on dorsal side. Aedeagus of males shorter in subspecies from Sumatra.

Distribution. Indonesia: Sumatra; Singapore; Malaysia: Peninsular Malaysia; Thailand (new country record).

Note. As in nominotypical subspecies, male parameres are rather different than in *Taeniodera ornata* Gory & Percheron.

***Taeniodera nigra* Jákl, 2011 stat. nov.**
(Figs. 16-20)

Taeniodera monacha nigra Jákl, 2011: 541, figs. 4a-c (original description).

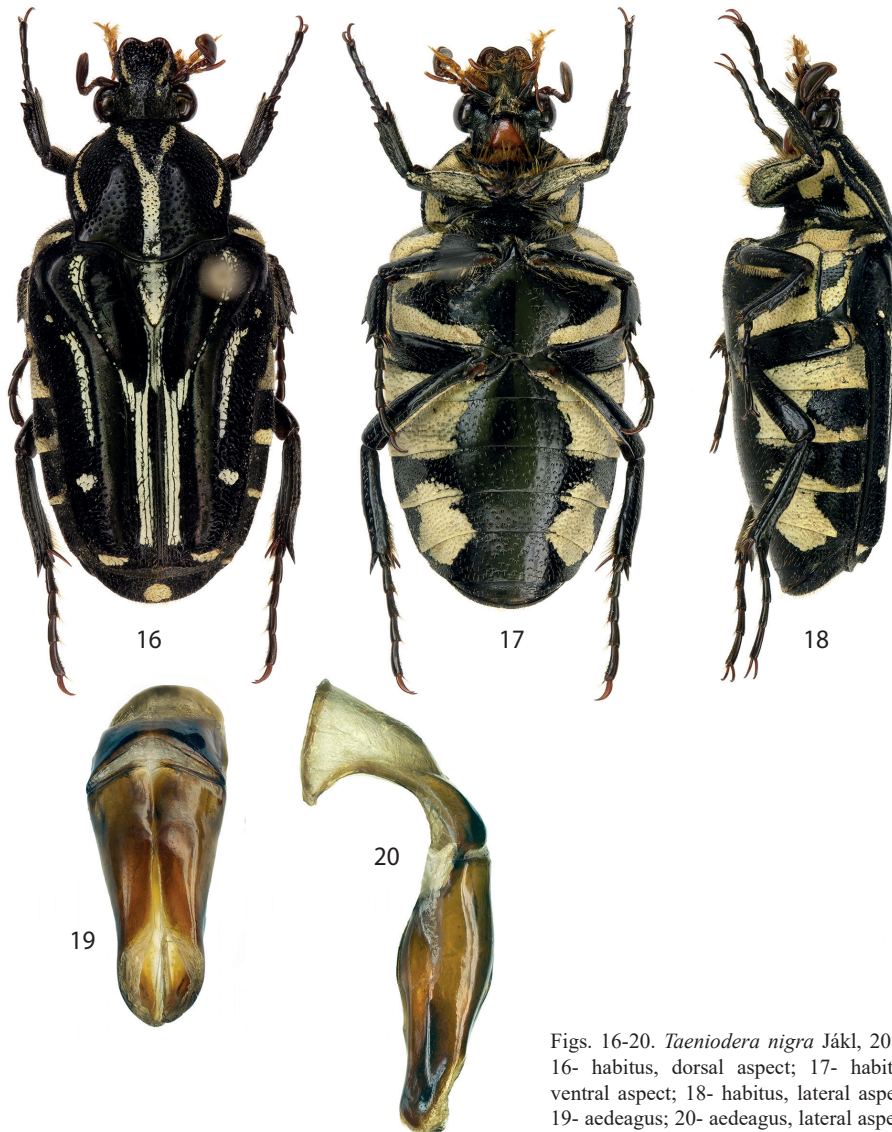
Taeniodera monacha (Gory & Percheron): Sakai & Nagai, 1998: 344, pl. 129, fig. 1516 - 11 (male, Siberut) [iconography].

Type locality. Indonesia, West Sumatra Province, Mentawai Archipelago, Siberut Island, north part, Bojakan village env., 50-200 m alt.

Type material. Holotype ♂ (MNPC) labelled: Indonesia, Mentawai Isls. / SIBERUT ISL., north, 50-200 m / BOJAKAN VILL. ENV., 5. 2004 / St. Jákl lgt. Paratypes Nos. 13-23 ♂♂, 24-27 ♀♀, 93 unsexed specimens (Paratypes Nos. 28-120) [SJCP, 2 PT in BMNH, 2 PT in MNHN, 2 PT in MNPC] labelled: same as holotype; 10 unsexed specimens (Paratypes Nos. 1-10) [SJCP] labelled: Indonesia, Mentawai Isls. / SIBERUT ISL., south, 0-50 m / SALIGUMA vill. env., 10. 1996 / local collectors lgt; Paratypes Nos. 11-12 (SJCP) labelled: Indonesia, Mentawai Isls. / SIBERUT ISL., south, 0-50 m / SALAPPA vill. env., 5. 2006 / St. Jákl lgt.

Additional material examined: 25 ♂♂, 20 ♀♀ (SJCP) labelled: INDONESIA, West Sumatra Prov. / Mentawai Archipelago, 50 m alt. / SIBERUT I., south part / Saliguma vill. env., II. 1995 / local collectors lgt.

Differential diagnosis. Jákl (2011) described this taxa as a subspecies of *Taeniodera monacha* Gory & Percheron, 1833 from Siberut Island. After additional examination and comparison with its congeners author decided to raise it to full species level. From *Taeniodera monacha* Gory & Percheron it can be separated in following characters: I. Both sides of body black, legs black,



Figs. 16-20. *Taeniodera nigra* Jákl, 2011: 16- habitus, dorsal aspect; 17- habitus, ventral aspect; 18- habitus, lateral aspect; 19- aedeagus; 20- aedeagus, lateral aspect.

dorsal and ventral ornament whitish, but bicolored reddish/black body, reddish legs and yellowish dorsal and ventral ornament in its javanese congener; II. Large part of body opaque with cover of basic tomentum, but with reflecting pronotum and sometimes also part of elytra in species from Java; III. Male parameres in *Taeniodera nigra* Jákl short, apex broadly rounded, but with longer, stout parameres and only slightly rounded parameral apex in species from Java (Figs. 4-5, 19-20).

From other species of the *Taeniodera monacha* Gory & Percheron species group can be *Taeniodera nigra* Jákl distinguished by the complex of following characters: Completely

black with black legs; coloration of dorsal and ventral ornament whitish; dorsal side with cover of basic tomentum, body opaque; male parameres short, in apex both parameral rims broadly rounded. Species occurring in Siberut Island is extremely similar to black specimens of *Taeniodera modesta* Schoch, 1898 and females might be difficult to identify unless locality is considered as a criterion. But aedeagi of males in both mentioned species are very helpful for the diagnosis.

Distribution. Indonesia: Mentawai Archipelago, Siberut Island.

***Taeniodera longipenis* sp. nov.**

(Figs. 21-25)

Type locality. South Vietnam, Lam Dong Province, Bao Loc.

Type material. Holotype (♂) (SJCP) labelled: S VIETNAM / Lam Dong prov. / Bao Loc, XI. 2016 / local collector leg. Paratypes: (No. 1 ♂, No. 2 ♀) (SJCP) labelled: same as holotype; (No. 3 ♂) (SJCP) labelled: Bao Loc / S. VIETNAM / 21-27. APR. 2000 / Masao Itoh-leg; (No. 4 ♀) (SJCP) labelled: S VIETNAM / Lam Dong prov. / Bao Lam, VI. 2019 / local collector leg.

Description of holotype. Body completely black, with reddish clypeus. Dorsal ornament beige, coloration of ventral ornament silvery white. Legs reddish. Body size 15.2 mm (excluding pygidium).

Head. Frons black and opaque, clypeus brownish with metallic lustre. Sides of frons and posterior half of sides of clypeus with yellowish vitta. Punctuation rather dense with large, circularly shaped diameters of punctures. Interspaces smaller or same as punctures diameters. Widest point in posterior half of clypeus. Apex of clypeus moderately incised. Medially long, yellowish setation present throughout total length. Antennae reddish, club slightly shorter than stalk.

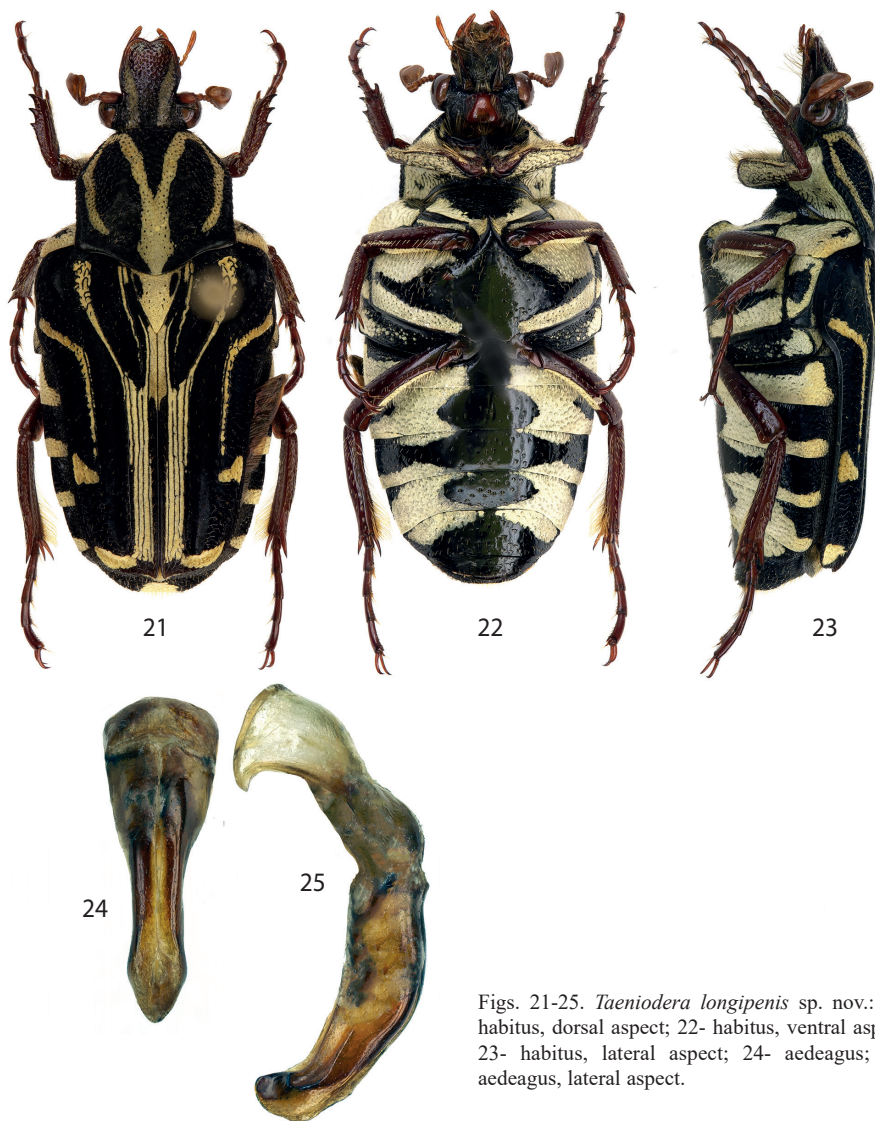
Pronotum. Black, opaque, completely covered with basic black tomentum. Coloration of pronotal ornament beige, pattern of ornament similar with *Taeniodera monacha* Gory & Percheron. Punctuation rather dense, horse shoe shaped, denser on sides and anterior part. Setation medially long and dense, its coloration yellowish. Anterior third of sides with border.

Scutellum. Triangularly shaped, with sharply developed apex. Coloration black, excepting anterolateral angles completely covered with beige ornament.

Elytra. Completely black, opaque. Coloration of elytral ornament beige, pattern of ornament similar to elytral pattern in *Taeniodera ornata* Gory & Percheron, *Taeniodera modesta* Schoch and *Taeniodera nigra* Jákl. Elytral disc with five longitudinally running striolate lines in each elytron. Humeral and apical calli obtuse. Sides and apex with rather sparse striolation. Sutural ridge flat, its ending slightly protruding over apex of elytra. Setation sparser than in pronotum, but present throughout total length.

Pygidium. Black, opaque, circularly striolated. Disc with circular, beige macula. Beige setation moderately dense and long.

Ventrum. Black, shining, basic tomentum absent. Abdominal sides, broad sides of metasternum, whole mesepimeron and large part of prosternum with cover of silvery white ornament and white to yellowish setation.



Figs. 21-25. *Taeniodera longipenis* sp. nov.: 21- habitus, dorsal aspect; 22- habitus, ventral aspect; 23- habitus, lateral aspect; 24- aedeagus; 25- aedeagus, lateral aspect.

Abdominal apex slightly constricted, abdominal impression not developed. Punctuation of abdomen rather sparse, horse-shoe shaped, present throughout total length. Metacoxae striolated, metasternal sides punctured, metasternal plate nearly impunctate. Mesometasternal process short and wide in base, in apex sharply developed.

Legs. Moderately long, coloration of femora, tibiae and tarsi reddish. Posterior margins of meso- and metafemora with cover of silvery white ornament, in profemora nearly whole surface with cover of ornament. Protibia tridentate, equidistant. Meso- and metatibia

with carina in posterior third. Metatibia with brush of long, yellowish to white setation in posterior third of inner side.

Genitalia. Parameres similarly structured as in *Taeniodera modesta* Schoch, but length of phallobase and parameres very different. In new species parameres long, approximately 1.5 times longer than length of phallobase (Figs. 24-25).

Variability. Other two males available for study differ only in size. Body size of males 14.5-15.2 mm (excluding pygidium).

Sexual dimorphism. Size of females 13.5-14.5 mm. Dorsal ornament in females ochre to yellowish, clearly darker and more expressed than in males. Ventral ornament in contrary much less developed than in males. Pronotal and partially also elytral punctation denser and deeper than in males. Legs shorter and more robust, protibia tridentate as in males, but slightly wider and shorter. Abdomen arched and its punctation denser.

Differential diagnosis. Black and opaque dorsum, beige dorsal ornament, silvery white ventral ornament, metallic lustre of reddish clypeus and elongated male parameres differ newly described species from all its congeners in *Taeniodera monacha* Gory & Percheron species group. Structure of male parameres is most close with *Taeniodera modesta* Schoch, but parameres in newly described species are distinctly longer than in species from Borneo and Sumatra. Average size of new species larger, black dorsum and completely reddish legs seems to also be useful.

Etymology. Named after elongated male parameres of newly described species.

Distribution. South Vietnam, Lam Dong Province.

DICHOTOMICAL KEY TO MALE AND FEMALE SPECIMENS OF *TAENIODERA* *MONACHA* GORY & PERCHERON SPECIES GROUP

- 1 (4) Legs reddish to brown, dorsal side reddish to brown or brown with black parts (excepting melanistic specimens of *Taeniodera modesta* Schoch, which are completely black).
- 2 (3) Dorsal side with black shining pronotum, sometimes also with reflecting black subscutellar area. Elytra reddish or at least most of elytral surface reddish. Male parameres rather stout and rather short, with nearly parallel running rims, in apex moderately rounded. Size 14.5-16.0 mm (excluding pygidium). Indonesia: Java Island..... *Taeniodera monacha* Gory & Percheron, 1833
- 3 (2) Dorsal side brown to dark brown or brown with black parts of elytra and pronotum or brown with whole pronotum black. Male parameres elongated, narrow, in apex sharply developed. Size 12.0-15.0 mm (excluding pygidium). Indonesia: Kalimantan, Sumatra; Malaysia: Borneo, Laut Island, Malay Peninsula; Thailand..... *Taeniodera modesta* Schoch, 1898
- 3a (3b) Pronotum black, rarely part of pronotum dark brown, elytra brown or brown with black sides or larger blackish parts, rarely completely black. Legs dark brown to black. Dorsal ornament very abundant. Indonesia: Kalimantan, Laut Island; Malaysia: Borneo *Taeniodera modesta* Schoch, 1898
- 3b (3a) Pronotum brown or brown with blackish parts, elytra reddish to brownish, rarely with small blackish areas. Legs brownish. Dorsal ornament moderately expressed. Indonesia: Sumatra; Malaysia: Malay Peninsula; Thailand..... *Taeniodera modesta sumatrana* Mikšič, 1976

- 4 (1) Legs black. Both body sides black.
- 5 (6) Body and legs completely black, ornament white. Male parameres short, parameral rims in apex broadly rounded. Size 13.0-15.5 mm (excluding pygidium). Indonesia: Mentawai Archipelago, Siberut Island
..... *Taeniodera nigra* Jákl, 2011
- 6 (5) Body black, legs reddish, ornament yellow. Male parameres elongated, approximately 1,5 times or more longer than phallobase. Size 13.5-15.2 mm (excluding pygidium). South Vietnam
..... *Taeniodera longipenis* sp. nov.

Note 1. Separation between rarely collected melanistic specimens of *Taeniodera modesta* Schoch and *Taeniodera nigra* Jákl is very difficult. Parameres of males are very different, but author did not find good morphological character, how to separate females, unless locality is taken as a criterion.

Note 2. Sakai & Nagai (1998: 344, pl. 129, fig. 1516 - 8 male, 1516- 9 female) published record of *Taeniodera monacha* Gory & Percheron from Natuna Island, laying far from northwestern coast of Kalimantan. This insect can't be attributed to any of known taxa and it might be undescribed species or new subspecies of *Taeniodera modesta* Schoch. Unfortunately author was not able to examine those specimens.

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