

**A contribution to knowledge of the genus *Glyptothea* Bates, 1889
with description of a new species
(Coleoptera: Scarabaeoidea: Cetoniinae: Taenioderini: Chalcotheina)**

Stanislav JÁKL

Geologická 1218c, CZ-158 00, Praha 5 - Hlubočepy, Czech Republic
e-mail: stanley.jakl@seznam.cz

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Abstract. A new species, *Glyptothea krikkeni* sp. nov., is described from the Indonesian part of Kalimantan. A male of newly described species is illustrated and compared with its recently known congeners. *Glyptothea kuehbandneri* Mikšič, 1984 is synonymised with *Glyptothea excavata* Janson, 1912. A redescription of female of *Glyptothea moultoni* Janson, 1912 is given. Male parameres of *Glyptothea moultoni* and *Glyptothea excavata* are photographed for the first time and are compared with male parameres of the newly described species. Distribution of the genus in both parts of Indonesian and Malaysian Borneo (Kalimantan) is shortly discussed. Separate taxonomical keys to males and females of all recently known representatives are given. An updated list of *Glyptothea* representatives with distribution areas is given.

INTRODUCTION

Glyptothea was recently placed in the subtribe Chalcotheina of the tribe Taenioderini. The genus was established by Bates in 1889 for a single species *Glyptothea whiteheadi* Bates, 1889, which became the type species of the genus. Other two species were described by Janson in 1912 and the last species was added by Mikšič in 1984. The most comprehensive work for *Glyptothea* still remains the Mikšič's monography published in 1976 although it misses *Glyptothea kuehbandneri* described by the author himself later in 1984 (synonymised with *G. excavata* in the present paper). Other works are only partial or just listing species (Krikken, 1984; Sakai & Nagai, 1998; Krajčák, 1998; Legrand & Chew Kea Foo, 2010).

All species of *Glyptothea* are restricted to Borneo Island and of Chalcotheina are rarely collected compared to other genera. In most institutional or private collections they are limited usually just to few specimens or are not present at all. Although all known species are described from the Malaysian part of Borneo, the genus is distributed across the whole island and especially in its still relatively undercollected Indonesian part, other new species or species described from the Malaysian part can be expected. Very little is known about natural history of *Glyptothea*. In Mt. Bawang (southwest Kalimantan, Indonesia) several specimens have been collected in flight and few males at light in early morning hours.

MATERIAL AND METHODS

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

- BMNH Natural History Museum, London, United Kingdom;
- KSCP private collection of Kaoru Sakai, Tokyo, Japan;
- MKCP private collection of Max Kuehbandner, Germany;
- RMNH Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands;
- SJCP private collection of Stanislav Ják, Praha, Czech Republic;

Specimens of newly described species are provided with red and yellow printed labels, red for HOLOTYPE, yellow for PARATYPE. Each holotype or paratype label is provided with sex

symbol, number of paratype (in paratype label) and words St. Jákl det., 2016. Label data are cited for the material examined, individual labels are indicated by a double slash (//), individual lines of every label by a single slash (/).

TAXONOMY

Glyptothea Bates, 1889

Glyptothea Bates, 1889: 390 (original description). Type species is *Glyptothea whiteheadi* Bates, 1889: 390 (by original designation); Schenkling 1921: 130 (catalogue); Mikšič 1976: 363 (monography), 358 (key); Krikken 1984: 64 (checklist); Sakai & Nagai 1998: 361 (iconography); Krajičik 1998: 94 (catalogue); Legrand & Chew Kea Foo 2010: 71 (review).

Diagnosis. Species of *Glyptothea* are distinguished from other genera of Chalcotheina by developed ribs and rugose structure in posterior elytra half. Partially bordered sides of pronotum cannot be anymore regarded as a good character because pronotum sides of the newly described species of *Glyptothea* are completely bordered. All representatives of *Glyptothea* belong to smallest species among Chalcotheina with average size 15-22 mm. Other small-sized genera of Chalcotheina are monotypical *Anocoela* Moser, 1914 and *Penthima* Kraatz, 1892. Beside different area of distribution (both not occurring in Borneo) they differ from *Glyptothea* by absence of elytra ribs. Same as small-sized *Microchalcothea* occurring in Borneo, but having completely smooth elytra. Some species of *Chalcotheomima* Mikšič, 1970, concretely *Chalcotheomima laevis* Arrow, 1932 (described as *Glyptothea*) can be also rather small, but are missing rugose structure and ribs in posterior part of elytra.

Glyptothea whiteheadi Bates, 1889

(Figs. 1-9, 34)

Glyptothea whiteheadi Bates, 1889: 390 (original description); Kraatz 1895: 370 (female description); Schenkling 1921: 130 (catalogue); Mikšič 1976: 364 (monography), 363 (key); Sakai & Nagai 1998: 361, fig. 1654 (iconography); Krajičik 1998: 94 (catalogue); Legrand & Chew Kea Foo 2010: 72, figs. 212-215 (review).

Type locality. Mount Kinabalu, North Borneo (J. Whitehead leg.).

Type material. Holotype (♂) in BMNH (ex coll. Alexander Fry) (examined).

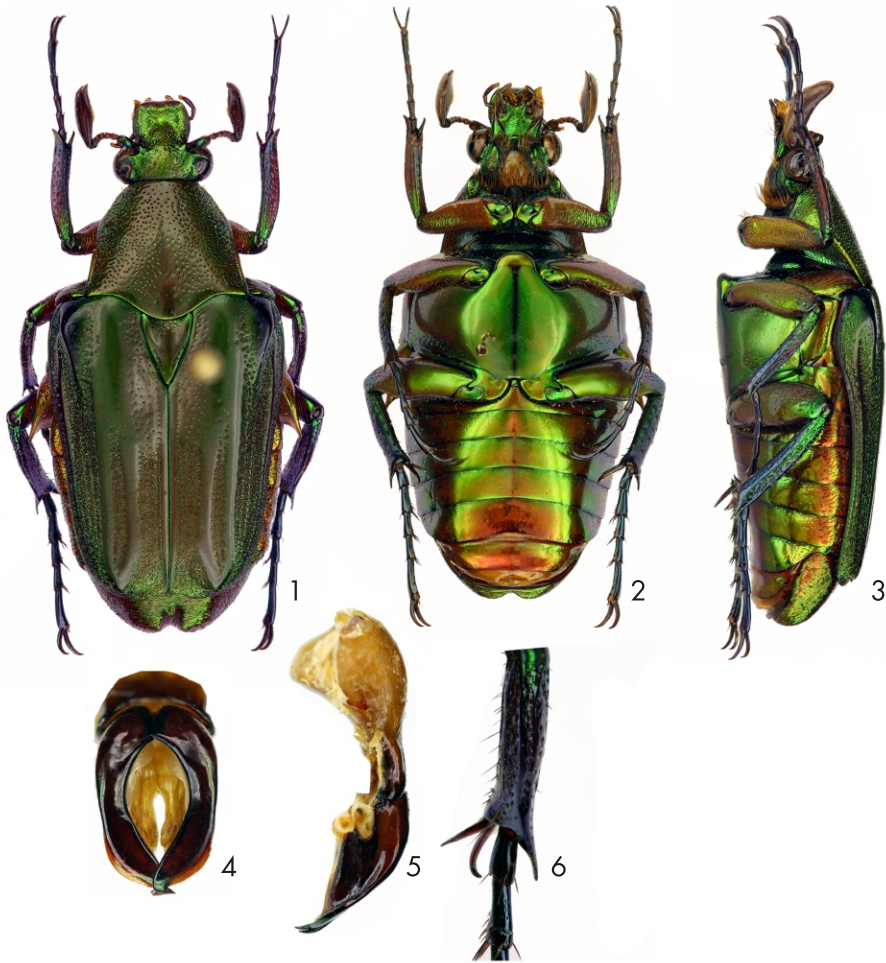
Additional material examined. 1 ♂ in SJCP labelled: Mamut/Mt. Kinabalu area/Sabah, Borneo/E. Malaysia/2.IV. 2003/A. & R. Abe leg; 1 ♂ in SJCP labelled: Malaysia, Borneo/SABAH, Crocker range/Kimanis rd. 18.4. 2005/local collectors lgt; 1 ♂ in SJCP labelled: (handwritten) Keningau/Sabah, IS. BORNEO/E. Malaysia/18.-29. APR. 1993; 1 ♀ in SJCP labelled: near Keningau/Sabah Borneo/E Malaysia/V. 1998.

Distribution. MALAYSIA: Borneo: Sabah.

Glyptothea moultoni Janson, 1912

(Figs. 10-18, 35)

Glyptothea moultoni Janson, 1912: 78 (original description); Schenkling 1921: 130 (catalogue); Mikšič 1976: 366 (monography), 363 (key); Sakai & Nagai 1998: 362, fig. 1655 (iconography); Krajičik 1998: 94 (catalogue).



Figs. 1-6. *Glyptothea whiteheadi* Bates, 1889: 1- habitus of male, dorsal aspect; 2- habitus of male, ventral aspect; 3- habitus of male, lateral aspect; 4- aedeagus; 5- aedeagus lateral aspect; 6- male metatibia.

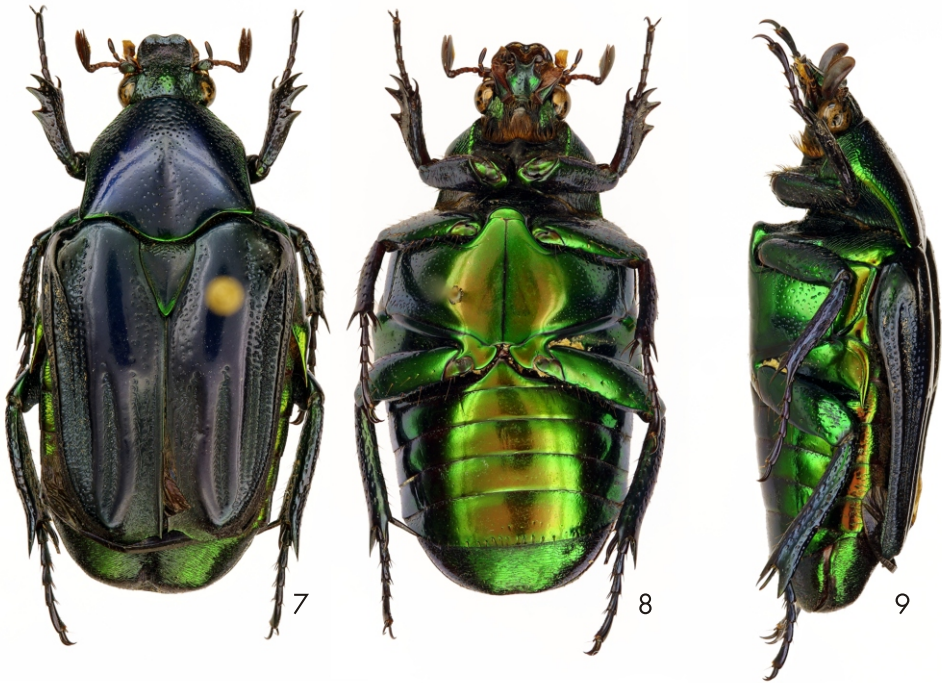
Type locality. Mt. Penrissen, Sarawak, 4200 - 4500 ft (leg. R. Shelford and J. C. Moulton).

Type material. Holotype ♂, Allotype ♀ in RMNH (examined).

Additional material examined. 2 ♂♂ in SJCP labelled: INDONESIA, V. 2014/West Kalimantan/MT. BAWANG/local collector leg; 7 ♂♂, 2 ♀♀ in SJCP labelled: INDONESIA, SW Kalimantan/ MT. BAWANG, 400-900 m alt./ V. 2015/local collectors leg.

Redescription of female. Body wide and relatively short, colouration blueish/green to blue. Lustre bright and strong. Size 17-18.5 mm (excluding pygidium).

Head. Green, sometimes with blueish tinge. Sides almost parallel. Punctuation denser in frons, punctures variously shaped. Apical margin of clypeus moderately incised. Antennae short, brownish, scapulae black.



Figs. 7-9. *Glyptothea whiteheadi* Bates, 1889: 7- habitus of female, dorsal aspect; 8- habitus of female, ventral aspect; 9- habitus of female, lateral aspect.

Pronotum. Colouration is blue, sides green. Reflection strong. Posterior half with triangularly shaped impression, middle line present throughout total length. Punctuation fine and thin, denser in anterior half, sides very finely striolate. Posterior half of sides with border.

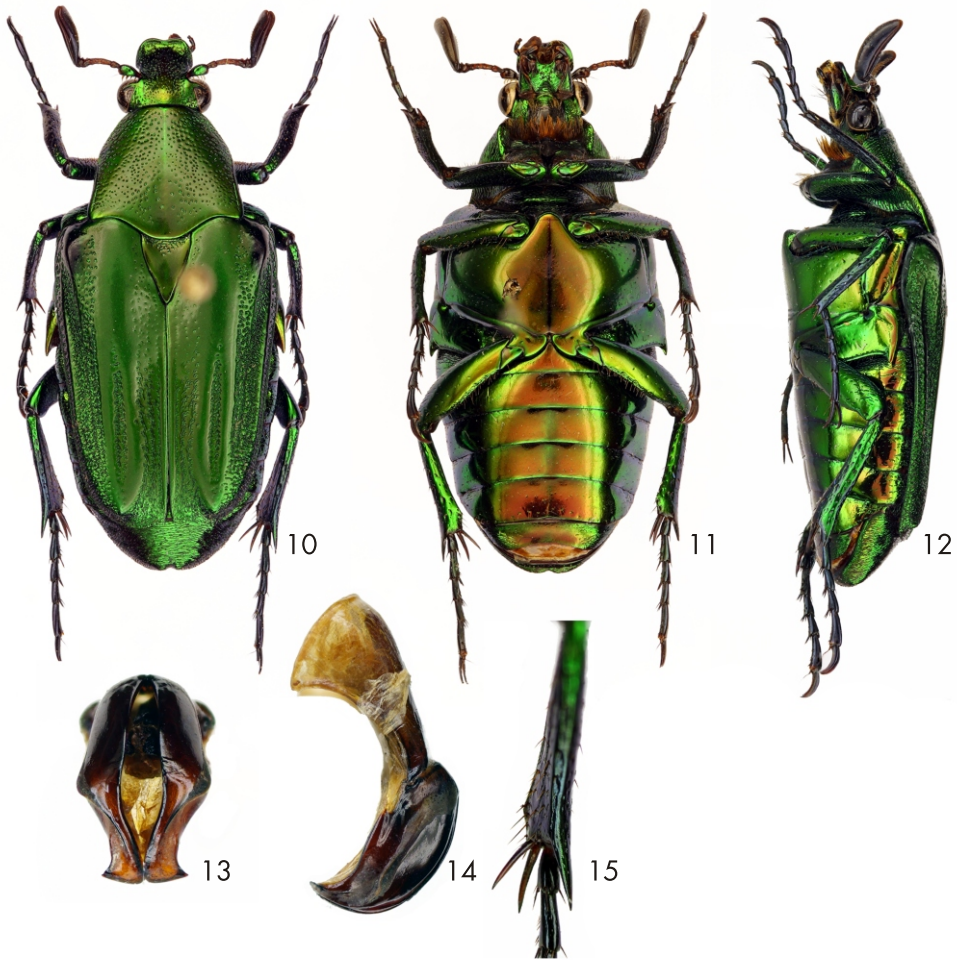
Scutellum. Blue with greenish margins. Shape approximately triangular, apex slightly elongate. Base punctured, rest of surface glabrous.

Elytra. Blue to blue/green. Anterior half of elytra disc and ribs almost impunctate, shining, rest of surface punctured or striolate. Anterior half of lateral ridge deeply and rugosely punctured, posterior half with deep longitudinal striolation. Lateral margins and apex deeply and densely granulate. Posterior half of elytra disc (except of glabrous ribs) with longitudinal striolation. Colouration in posterior half usually lighter. Sutural ridge flat, its apex very finely protruding over elytra apex. Humeral calli blackish, sharply elevated, apical calli present, but rather obtuse.

Pygidium. Blue to greenish with not very deep circularly shaped, dense striolation. Middle apical impression absent or indistinctly developed.

Venter. Bright green, shining. Abdomen arched, impunctate, 5th abdominal segment with brownish setation in its posterior margin. Apart of disc, metasternum moderately punctured. Setation absent. Mesometasternal process sharply narrowing to apex, its termination rounded, slightly protruding over level of mesocoxae. Prosternum and mentum deeply striolate or punctured.

Legs. Moderately long. Femurs green, shining, posterior margins with brownish setation. Tibia blue to dark blue. Tarsi dark blue to blackish. Protibia tridentate, teeth not equidistant. Mesotibia indistinctly carinate in posterior half.



Figs. 10-15. *Glyptothea moultoni* Janson, 1912: 10- habitus of male, dorsal aspect; 11- habitus of male, ventral aspect; 12- habitus of male, lateral aspect; 13- aedeagus; 14- aedeagus lateral aspect; 15- male metatibia.

Note. Colouration of holotype male legs deposited in Leiden is significantly different from all males available for study originating from southwest Kalimantan. Legs (especially tibia) in the Leiden holotype are green with reddish tinge, all male specimens from southwest Kalimantan are with dark green to green/blackish tibia. However, the specimens identical are identical in all other characters.

Distribution. MALAYSIA: Borneo: Sarawak; INDONESIA: SW Kalimantan.

***Glyptothea excavata* Janson, 1912**

(Figs. 19-27, 36)

Glyptothea excavata Janson, 1912: 78 (original description); Schenklng 1921: 130 (catalogue); Mikšič 1976: 366 (monography), 364 (key); Krajčik 1998: 94 (catalogue).

Glyptothea kuehbandneri Mikšič, 1984: 301 (original description) Type locality: Borneo, Sabah, 29.8. - 4.9. 1978, Kinabalu N. P. Head Quarter, 116°32' E 6°03' N, 1650 m (leg. Bogenberger and Rachtl). Holotype (♂) in MKCP; Sakai & Nagai 1998: 362, fig. 1656 (iconography); Krajčik 1998: 94 (catalogue); Legrand & Chew Kea Foo 2010: 72, fig. 210-211 (review) **syn. nov.**

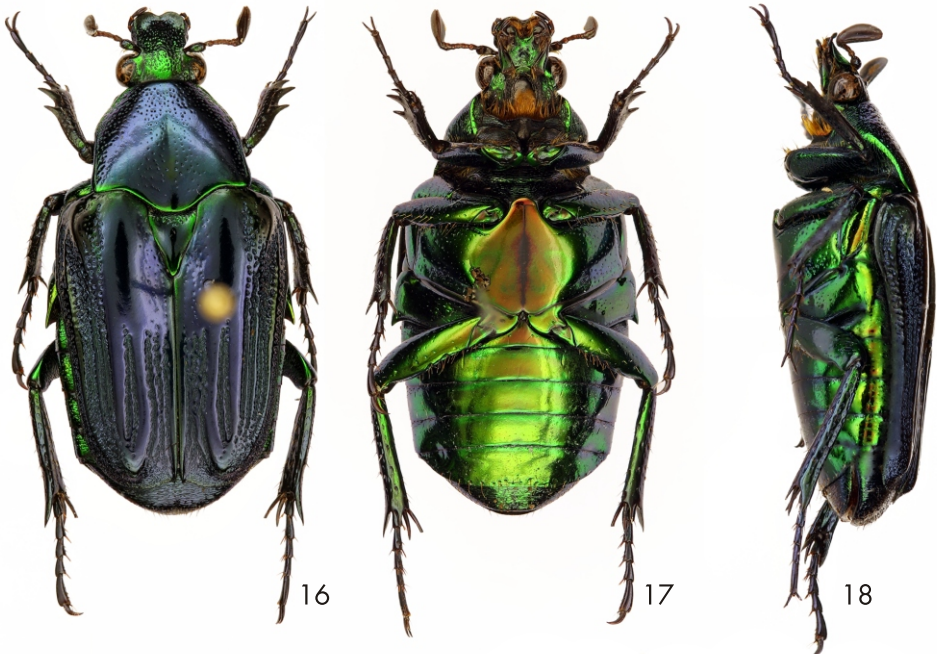
Type locality. Mt. Kina-balau (ex van de Poll. coll.).

Type material. Holotype (♀) in RMNH (examined).

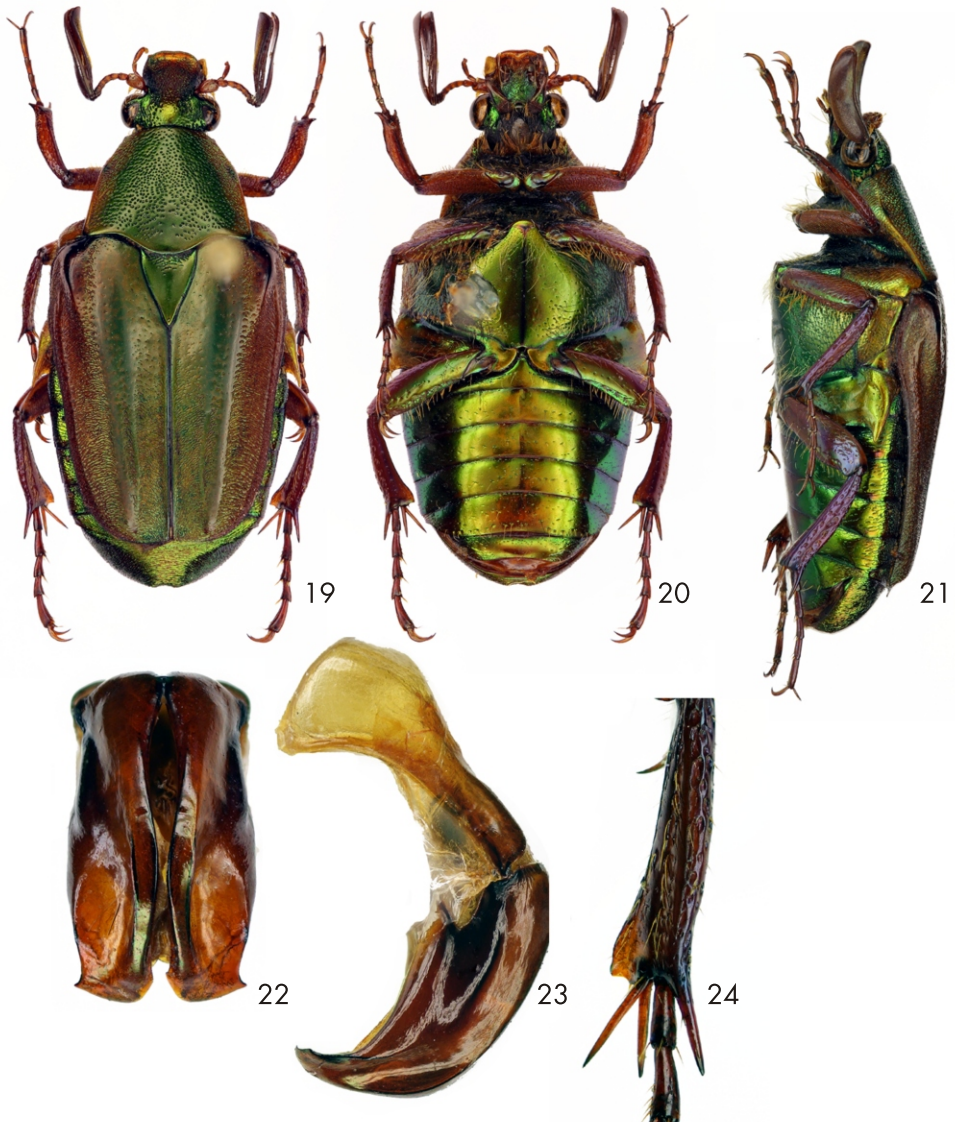
Additional examined material. 1 ♂ in SJCP labelled: Masilau/Sabah, Borneo/E. Malaysia/25.III. 2007/A. et R. Abe leg; 1 ♀ in SJCP labelled: N. BORNEO/Mt. Kinabalu/Mesilau Camp./18.-20.III. 1964/Royal Soc. Exped./coll. S. Kueh/B.M. 1964-250 (exchanged with BMNH); other numerous specimens with the same locality deposited in BMNH.

Note. Description of *G. kuehbandneri* Mikšič, 1984 is based on males. Janson's description of *Glyptothea excavata* was based just on a single female. After examination of Janson's type deposited in Leiden, it became clear that both species are identical and Janson's species has priority. However *G. excavata* differs significantly from other three *Glyptothea* species and it could be easily accommodated in a new subgenus or completely different new genus.

Distribution. Malaysia: Borneo, Sabah, Kinabalu.



Figs. 16-18. *Glyptothea moultoni* Janson, 1912: 16- habitus of female, dorsal aspect; 17- habitus of female, ventral aspect; 18- habitus of female, lateral aspect.

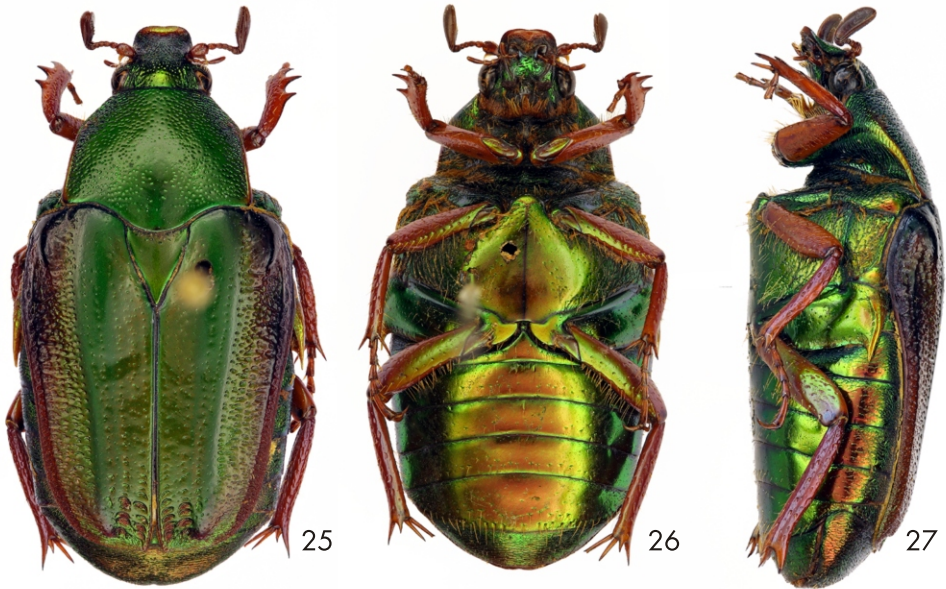


Figs. 19-24. *Glyptothea excavata* Janson, 1912: 19- habitus of male, dorsal aspect; 20- habitus of male, ventral aspect; 21- habitus of male, lateral aspect; 22- aedeagus; 23- aedeagus lateral aspect; 24- male metatibia.

***Glyptothea krikkeni* sp. nov.**
(Figs. 28-33, 37)

Type locality. Indonesia, West Kalimantan, Mt. Saran, 1700 m alt.

Type material. Holotype (♂) labelled: Mt. Saran, 1700m/W. Kalimantan/INDONESIA/VI. 1992. Paratypes: Nos. 1-3 ♂♂ (KSCP) labelled: same as holotype.



Figs. 25-27. *Glyptothea excavata* Janson, 1912: 25- habitus of female, dorsal aspect; 26- habitus of female, ventral aspect; 27- habitus of female, lateral aspect.

Description of holotype. Dark green, mildly reflecting, body length (excluding pygidium) 18.2 mm, maximum width 9.1 mm.

Head. Grassy green with mild reflection. Frons shorter than clypeus. Punctuation of frons medially developed, density approximately same as in clypeus. Setation absent. Lateral side of circularly shaped clypeus present, but rather indistinct. Apical margin of clypeus very distinctly, almost vertically elevated, apex straight without even indistinct emargination. Antennae long, stalk brownish, pedicel almost black. Stalk and posterior lamella of stalk with reddish setation.

Pronotum. Grassy green, mildly reflected. Punctuation simple, but dense, puncture diameters as large as or larger than interspaces. Also triangularly shaped basal impression (stretching almost to anterior margin) punctured, but density much thinner than in other parts. Lateral border present throughout total length, in anterior half lower, but distinctly developed. Anterior and posterior margins unbordered, impunctate.

Scutellum. Large, almost triangularly shaped, apex sharp. Grassy green with very mild lustre, except of basal fourth impunctate.

Elytra. Dark green, between lateral ridge and lateral margins dark green to brownish-green. Punctuation of anterior half of disc very thin and simple. Posterior half with two typical, impunctate ribs adjoining in elytra apex. Surface between elytra ribs and sutural ridge completely and densely striolate. Lateral sides striolate throughout total elytra length, except of the narrow, impunctate rib running beside lateral margin of each elytron. Humeral calli with one sharp like short rib declivity, apical calli flat. Sutural ridge flat, not protruding over elytra apex.

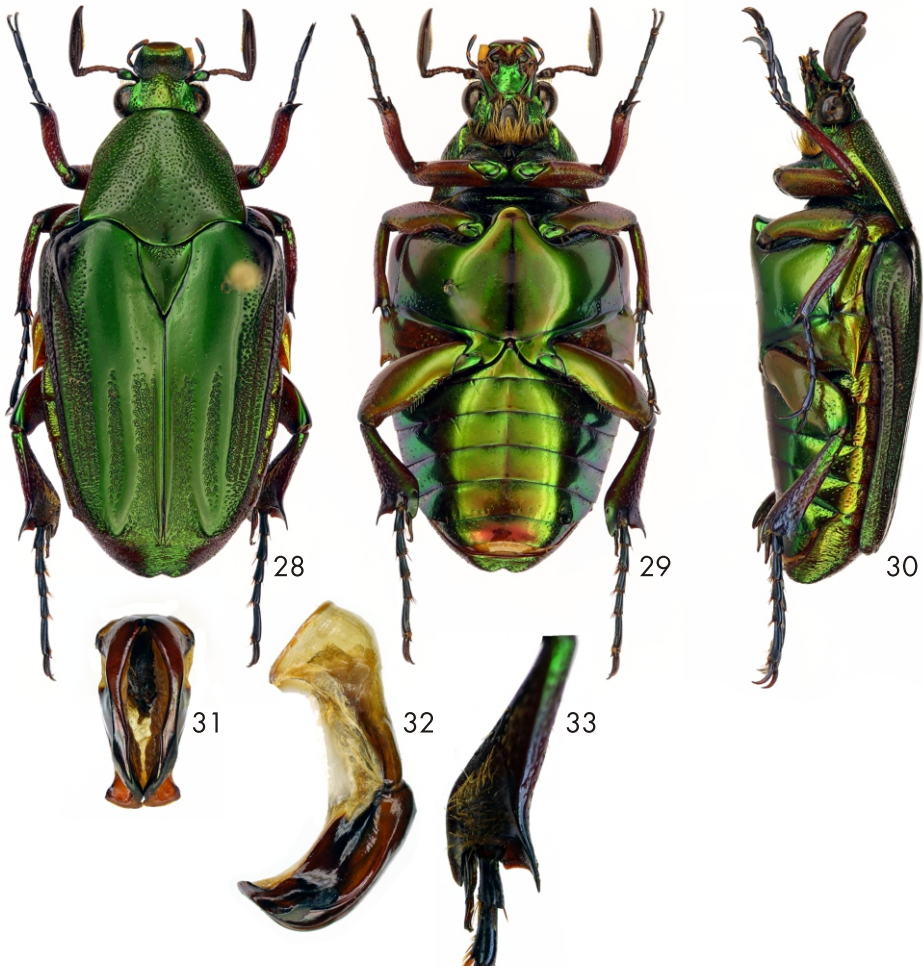
Pygidium. Colouration is brownish to green. Striation very dense, horizontal running throughout total surface. Apex with indistinctly developed impression. Setation absent.

Ventrum. Colouration green, much lighter than dorsal side, with strong reflection. Abdomen

impunctate, discal impression moderately deep and wide. Metasternum green (posterolateral margins brownish-green) shining, impunctate. Setation absent. Mesometasternal process triangularly shaped, completely glabrous, its apex rounded, not curved. Prosternum and mentum darker green, most of surface striolate, mentum bearing yellowish setation.

Legs. Moderately long. Femurs and tibia brownish with green tinge, tarsi black. Protibia unidentate, its anterior half curved inwards. Metatibia widening from base to apex, its apex 3-4 times wider than base. Terminal spur rather long, its termination very sharply curved, at angle almost 90° .

Genitalia. Inner parameres almost parallel running, apex terminated with rounded flaps (Figs. 31-32).



Figs. 28-33. *Glyptothea krikkeni* sp. nov.: 28- habitus of male, dorsal aspect; 29- habitus of male, ventral aspect; 30- habitus of male, lateral aspect; 31- aedeagus; 32- aedeagus lateral aspect; 33- male metatibia.

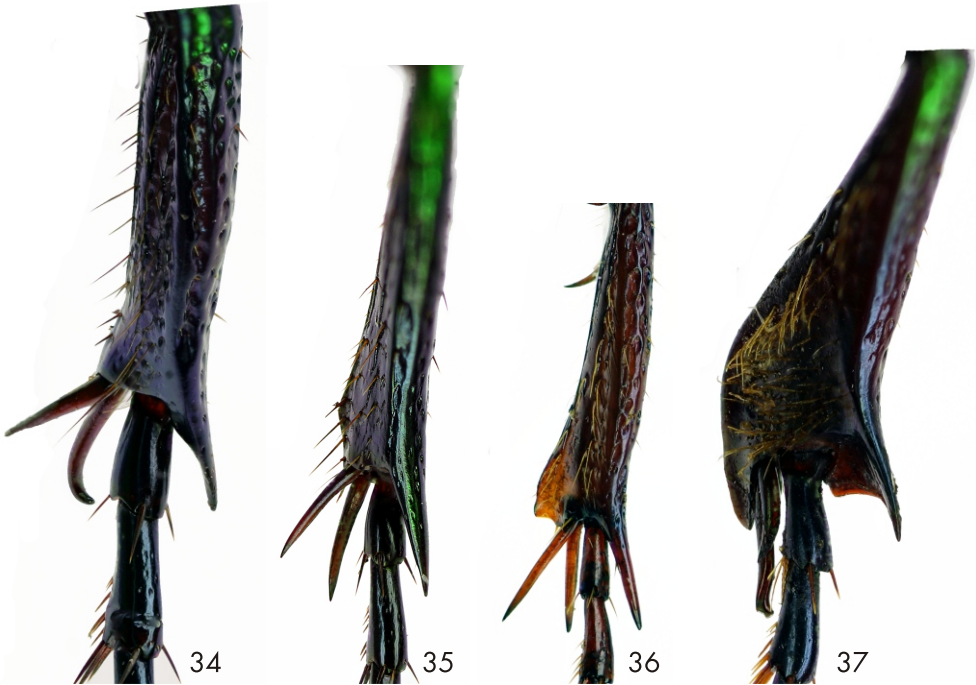
Variability and sexual dimorphism. Paratypes more or less identical with holotype.

Female remains unknown.

Differential diagnosis. Habitually the species is similar to *Glyptothea whiteheadi* and *Glyptothea moultoni*. From both species it can be easily distinguished by complete border of pronotum sides and differently shaped male parameres. Beside that from *Glyptothea whiteheadi* new species differs by not so extremely elevated apical margin of clypeus, which apex is rounded in *G. whiteheadi*, but straight in new species; by differently shaped pronotum, which is much narrower and sharply narrowing to apex, but wider and more or less rounded in new species; by very deep pygidial impression of *G. whiteheadi*, but just indistinctly developed impression in new species and by normally developed metatibia in *G. whiteheadi*, but extremely to apex widening metatibia in new species and by very long metatibia terminal spur in *G. whiteheadi*, but much shorter in new species. From *G. moultoni*, the new species (beside two characters mentioned above) can be distinguished by not incised apex of clypeus (straight developed in new species) and differently shaped metatibia and its terminal spurs.

Distribution. Indonesia: West Kalimantan, Mt. Saran, 1700 m.

Etymology. Named in honour of Jan Krikken (Leiden, Netherland), renowned Cetoniinae specialist.



Figs. 34-37. Metatibiae of males: 34- *Glyptothea whiteheadi* Bates, 1889; 35- *Glyptothea moultoni* Janson, 1912; 36- *Glyptothea excavata* Janson, 1912; 37- *Glyptothea krikkeni* sp. nov.

TAXONOMICAL KEY TO MALES OF GLYPTOTHEA

- 1 (2) Posterior half of elytra with single rib (second indistinct). Colouration of elytra brownish or green-brownish. Punctuation of pronotum very dense, puncture diameters in large part of surface larger than interspaces, laterally striolate. Sides of metasternum plate with reddish setation. Size 15-18 mm.
..... *Glyptothea excavata* Janson, 1912
- 2 (1) Posterior half of elytra with two rather wide, glabrous ribs adjoining on elytra apex. Colouration of elytra grassy green (except of lateral ridge). Punctuation of pronotum moderately dense, puncture diameters mostly not larger than interspaces, lateral striolation rather thin, if present. Metasternum plate glabrous. Size 18-21 mm.
- 3 (4) Lateral margins of pronotum completely bordered. Apex of metatibia very wide and enlarged, comparing to base approximately four times wider. Apical margin of clypeus straight.
..... *Glyptothea krikkeni* sp. nov.
- 4 (3) Lateral margins of pronotum bordered only in posterior half or third. Apex of metatibia normally developed or slightly widened, but never four times wider than base. Apical margin of clypeus rounded or incised.
- 5 (6) Apical margin of clypeus almost vertically elevated and rounded. Middle terminal spur of metatibia twice longer than remaining two and terminated with sharp curvature. Width of base and apex of metatibia approximately same. Apical impression of pygidium very deep.
..... *Glyptothea whiteheadi* Bates, 1889
- 6 (5) Apical margin of clypeus not elevated, middle part incised. Middle terminal spur of metatibia same sized with others, its termination without curvature. Metatibia apex approximately two times wider than its base. Apex of pygidium only with indistinct impression. *Glyptothea moultoni* Janson, 1912

TAXONOMICAL KEY TO FEMALES OF GLYPTOTHEA

- 1 (4) Dorsal colouration blue to blue/green, strongly shining. Size 17-21 mm. Antennae dark brown to black. Posterior half of elytra with two distinct ribs and deep longitudinal striolation. Sides of metasternum glabrous, setation absent.
- 2 (3) Pygidium with central deep impression throughout total length. Apical margin of clypeus moderately elevated and incised. Disc of elytra anterior half simply and finely punctured.
..... *Glyptothea whiteheadi* Bates, 1889
- 3 (2) Pygidium with very shallow and almost indistinctly developed impression at its apex. Apical margin of clypeus incised, but not elevated. Disc of elytra anterior half almost impunctate. General appearance strongly shining. *Glyptothea moultoni* Janson, 1912
- 4 (1) Dorsal colouration green to brownish, reflection medially developed. Size 15.5-18.5 mm. Striation in posterior elytra half horizontal. Sides of metasternum punctured and striolate, covered with abundant brownish setation. Posterior half of elytra with one glabrous rib, second rib very vague and indistinctly developed. *Glyptothea excavata* Janson, 1912

Note. Female of *Glyptothea krikkeni* sp. nov. remains unknown, but with high probability will be close to *G. whiteheadi* and *G. moultoni*.

UPDATED LIST OF GLYPTOTHEA SPECIES

<i>Glyptothea excavata</i> Janson, 1912	Malaysia: Borneo: Sabah, Mt. Kina Balu
<i>Glyptothea kuehbandneri</i> Mikšič, 1984 syn. nov.	
<i>Glyptothea moultoni</i> Janson, 1912	Malaysia: Borneo: Sarawak; Indonesia: SW Kalimantan
<i>Glyptothea krikkeni</i> sp. nov.	Indonesia: West Kalimantan: Mt. Saran
<i>Glyptothea whiteheadi</i> Bates, 1889	Malaysia: Borneo: Sabah, Mt. Kina Balu

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