

**A contribution to knowledge of genus *Pseudochalcothemima*
Mikšič, 1985 with description of a new species
(Coleoptera: Scarabaeoidea: Cetoniinae: Taenioderini: Chalcotheina)**

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Abstract. *Pseudochalcothemima legrandi* sp. nov. is described from the Indonesian part of Kalimantan. Male and female of the newly described species are illustrated and compared with its recently known congeners. Male parameres are photographed and compared with male parameres of other representatives of the genus. The distribution area of the genus in both parts of Malaysian and Indonesian Borneo (Kalimantan) is shortly discussed. Separate taxonomical keys to males and females are given. Updated list of *Pseudochalcothemima* Mikšič, 1985 species is provided.

INTRODUCTION

Pseudochalcothemima Mikšič, 1985 was recently placed in the subtribe Chalcotheina belonging to the tribe Taenioderini. Its distribution is restricted to Asia, mainly southeast parts of Asia. The genus was described by Mikšič in 1985 as a subgenus of *Pseudochalcothea* Ritsema, 1882. To the full generic rank it was raised by (Antoine 1990). Two species were accommodated in the newly established genus, *Pseudochalcothemima compacta* (Janson, 1912) - originally placed in *Pseudochalcothea* and the newly described *Pseudochalcothemima allardi*. Third recently known species, *Pseudochalcothemima sammananni*, was added by Legrand and Chew Kea Foo in 2010.

Representatives of *Pseudochalcothemima* belong to one of the most uniformly looking genera among Chalcotheina. Differences between species are small, mainly in shape of the clypeus apical margin, shape of the male metatibia, shape of the mesometasternal process, structure of the abdominal impression in males, dorsal and ventral punctation and structure of male parameres. Females are more difficult to identify than males. Females can be separated mainly by differently shaped head, apex of the clypeus, mesometasternal process and also by different dorsal and ventral punctation. Up to now, the distributional area of three described species was restricted to The Malaysian part of Borneo. All recently known species have been collected in Kina Balu, Crocker Range and Mount Trus Madi. They are also recorded from the Tenom area. The present author recently received few specimens of *Pseudochalcothemima* from Mount Bawang, situated in the southwest part of Indonesian Borneo (Kalimantan). This species is similar to other three already known species, but differs in several respects and will be described in the present article. The area was surveyed during last two decades and it is not the first case of finding interesting Cetoniinae beetles there. From the same type locality, other interesting species, as for example *Theodosia antoinei* Nagai, 1998 or *Xenoloba elegans* Sakai, 1998 were previously described. Main reason for rather large concentration of endemic species might be almost complete isolation of Mount Bawang from the rest of Borneo, main ranges lying in central and especially in north and northeastern parts of the island.

MATERIAL AND METHODS

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

- LPCP private collection of Jean-Philippe Legrand, Paris, France;
MNHN Muséum national d'Histoire Naturelle, Paris, France;
RMNH Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands;
SJCP private collection of Stanislav Jákl, Praha, Czech Republic;
ZMSZ Zamaljski Mujski, Sarajevo, Bosnia and Hercegovina (ex coll. of René Mikšič).

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., 2016. Label data are cited for the material examined, individual labels are indicated by a double slash (/ /), individual lines by a single slash (/).

TAXONOMY

Pseudochalcotheomima Mikšič, 1985

Pseudochalcothea (*Pseudochalcotheomima*) Mikšič, 1985: 142 (original description); Krajičik 1998: 96 (catalogue).
Pseudochalcotheomima Mikšič: Antoine 1990: 5 (new rank); Sakai & Nagai 1998: 366 (iconography); Krajičik 1999: 70 (catalogue); Legrand & Chew Kea Foo 2010: 76 (review).

Type species. *Pseudochalcothea compacta* Janson, 1912 [= *Pseudochalcothea* (*Pseudochalcotheomima*) *subinermis* Mikšič, 1985] (designated by Mikšič 1985: 143).

Diagnosis. The genus can be defined by the complex of the following characters: body moderately to strongly shining, missing any granulation or elytra ribs; colouration grassy green; dorsal punctation very fine to fine, except of striolation in lateral sides of elytra; intermediate size of 21-26 mm; head more or less parallel developed, never sharply widening to apex; apical margin of clypeus slightly to medially incised; sides of pronotum completely bordered; central impression in pronotum always present; disc of pronotum and elytra impunctate or finely punctate; lateral sides of elytra at least in its posterior half and elytra apex with fine and simple striolation; pygidium striolate, its apex with shallow impression; abdominal impression of males absent or indistinct (with exception of *P. sammananni*); mesometasternal process rather small, its termination sharply pointed or rounded; antennae club of males longer or same as pedicel; metatibia of males simple, not bearing any process; male protibia unidentate, female protibia tridentate; male parameres simply developed, outer rim of parameres very narrow or medially wide, inner rim parallel or narrowing from base to apex.

In author's opinion, the closest genus is *Chalcotheomima* Mikšič, 1970. Both species of *Chalcotheomima* differ from *Pseudochalcotheomima* by the presence of ventral setation and by the shape of apical margin of clypeus, which is rounded or just very slightly emarginate. From representatives of *Pseudochalcothea* it can be distinguished by the absence of metatibial process in males. Females can be distinguished only by using the complex of characters for *Pseudochalcotheomima* and *Pseudochalcothea*. After examination of all *Pseudochalcothea* species (excepting the male of *P. nishikawai* Sakai, 1993) the author supposes that all other characters between *Pseudochalcothea* and *Pseudochalcotheomima* mentioned by (Antoine, 1990b) and (Mikšič, 1985) can be confusing as there is always at least one or more species among *Pseudochalcothea* missing one of characters provided by the mentioned authors.

***Pseudochalcotheomima allardi* Antoine, 1990**

(Figs. 1-8)

Pseudochalcothea allardi Antoine, 1990: 6 (original description); Sakai & Nagai 1998: 366, figs. 1694 (1-3) (iconography); Krajčik 1999: 70 (catalogue); Legrand & Chew Kea Foo 2010: 77, figs. 235-237 (review); *Pseudochalcothea* (*Pseudochalcotheomima*) *allardi* (Antoine): Krajčik 1998: 96 (catalogue).

Type locality. Borneo, Sabah, Crocker Range.

Type material. Holotype (♂), Allotype (♀) are deposited in MNHN (examined).

Additional material examined. 3 ♂♂, 2 ♀♀ (SJCP) labelled: Malaysia, SABAH, 11. VII./Crocker Range, 2004/local collector lgt; 1 ♂ (SJCP) labelled: Malaysia, SABAH/Crocker Range/IX.2004/local collector lgt; 1 ♂, 1 ♀ (SJCP) labelled: Malaysia, Borneo/SABAH, Crocker Range/Kimanis rd., 26.3.2005/local collectors lgt; 1 ♂ (SJCP) labelled: CROCKER RANGE/SABAH/BORNEO, IV-88; 3 ♀♀ (SJCP) labelled: Malaysia, SABAH/Crocker range, IV. 2009/Kimanis road/local collector lgt.

Distribution. Malaysia, Borneo, Sabah: Crocker range, Mt. Trus Madi, Tenom Region.

***Pseudochalcotheomima compacta* (Janson, 1912)**

(Figs. 9-16)

Pseudochalcothea compacta Janson, 1912: 76 (original description); Schenkling 1921: 130 (catalogue); Mikšič 1970: 219 (revision); Mikšič 1976: 415 (monography).

Pseudochalcothea (*Pseudochalcotheomima*) *compacta* Janson: Mikšič 1985: 143 (subgeneric description); Krajčik 1998: 96 (catalogue).

Pseudochalcotheomima compacta (Janson): Antoine 1990: 6 (new rang); Sakai & Nagai 1998: 366, figs. 1693 (1-2) (iconography); Krajčik 1999: 70 (catalogue); Legrand & Chew Kea Foo 2010: 76, figs. 233-234 (review).

Pseudochalcothea (*Pseudochalcotheomima*) *subinermis* Mikšič, 1985: 143 (original description) - type locality: Borneo, Kina Balu (Holotype male deposited in ZMSZ); Antoine 1990: 5 (= *Pseudochalcotheomima compacta*).

Type locality. Borneo, Kina Balu.

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

Additional material examined. 1 ♂ (SJCP) labelled: Kimanis/Crocker Range/Sabah, N. Borneo/E. Malaysia/25.III. 1997; 1 ♀ (SJCP) labelled: Mt. Trus Madi/Sabah, N. Borneo/E. Malaysia/II.2004.

Distribution. Malaysia, Borneo, Sabah, Crocker Range.

***Pseudochalcotheomima sammananni* Legrand & Chew Kea Foo, 2010**

(Figs. 17-21)

Pseudochalcotheomima sammananni Legrand & Chew Kea Foo, 2010: 77, fig. 238 (original description).

Type locality. Malaisie orientale, Sabah, mount Trus Madi.

Type material. Holotype (♂) deposited in PLCP, paratype male in SJCP (examined).

Additional material examined. None.

Distribution. Malaysia, Borneo, Sabah, Mt. Trus Madi.

Note. Female of *Pseudochalcotheomima sammananni* unknown.

***Pseudochalcotheomima legrandi* sp. nov.**

(Figs. 22-29)

Type locality. Indonesia, SW Kalimantan, Mt. Bawang, 200-1000m.

Type material. Holotype (♂) (SJCP) labelled: INDONESIA, SW Kalimantan/MT. BAWANG, 200-1000m/X.2015/local collector leg. Paratypes: (No. 1 ♂ (PLCP), No. 2 ♀ (SJCP)) labelled: same as holotype; (Nos. 3-32 ♂♂, Nos. 33-52 ♀♀) labelled: same as holotype, but V.2016.

Description of the holotype. Completely grassy green with lighter ventral side, moderately shining. Body size (excluding pygidium) 26.2 mm, humeral width 10.1 mm.

Head. More or less parallel, clypeus with lateral borders. Colouration green with moderate reflection. Frons almost impunctate on disc, its sides with fine irregular punctation. Punctation of clypeus denser, especially at sides. Apical margin of clypeus rounded, with moderate incision. Lateral border of clypeus rather sharp, running from level of antennal scape, almost reaching apical margin of clypeus. Length of antennal club approximately equal to pedicel. Colouration of scape green with lustre, pedicel green to black, club blackish. Pedicel with reddish setation.

Pronotum. Uniformly green, shining, sharply narrowing to apex, laterally with emargination in posterior half. Sides completely bordered. Central, longitudinal impression developed throughout total length, but shallow, especially in its anterior half. Disc and basal lobe impunctate (apart of micropunctation), lateral margins with very fine striolation in anterior half. Declivity of anterolateral margins almost invisible in view from above. Setation absent.

Scutellum. Green, shining, triangular, with slightly curved margins near base. Punctation very fine and present only around base.

Elytra. Completely grassy green, shining. From base gently and gradually narrowing to apex. Subhumeral emargination not developed. Except lateral sides completely impunctate. Posterior half of lateral sides and apex with fine striolation. Anterior lateral half with finer punctation to striolation. Humeral and apical calli very obtuse, impunctate. Moderately shallow impression developed throughout total elytra length. Sutural ridge completely flat, very shortly protruding over elytra apex. Posterior elytra half with an indistinctly developed striolate line beside sutural ridge.

Pygidium. Green, but darker, shape approximately semicircular. Whole surface with rather dense granulation to striolation. Apical margin with moderately deep impression. Reddish setation present throughout total length, denser on apex.

Ventrum. Green, lighter than dorsal side, strongly shining. Abdomen indistinctly impressed, but not arched. All abdominal segments impunctate, excepting a narrow part beside lateral margins, here with very fine and thin striolation. Metasternal plate glabrous, shining, sides of metasternum with very fine punctation and striolation mainly near posterolateral margins. Mesometasternal process small, short, its apex rounded.

Prosternum green, moderately shining, rather dense striolation present across whole surface. Mentum green, covered with reddish setation.

Legs. Long, green, femurs with reddish setation near posterior margins. Tibia with short, blackish setation on inner sides. Protibia unidentate. Metatibia apex enlarged, robust, approximately three times wider than base, tridentate. Terminal spurs moderately long, sharply developed. Spur in inner side longer than two others.

Genitalia. Width of inner and outer paramere rims approximately same. Outer rim developed only in two apical thirds, not reaching apex. Inner paramere rims almost parallel (Figs. 28, 29).

Variability. Size range of paratypes 23.9-25.3 mm. In other aspects almost identical.

Sexual dimorphism. Size of females (excluding pygidium) 23.8-25.1 mm. Colouration same as in males. Punctuation and striolation of pronotum and elytra slightly more expressed. Punctuation of clypeus rather dense, much more than in males. Protibia shorter, more robust, tridentate. Metatibia normally developed, not apically enlarged as in males. Antennae club slightly shorter than pedicel. Abdomen more arched.

Differential diagnosis. Habitually all *Pseudochalcotheomima* are very similar to each other. *P. legrandi* sp. nov. is sharing more of identical characters with *P. allardi* Antoine than with other two known species. Males of newly described species can be distinguished from *P. allardi* in following aspects:

I. Parameres inner rim parallel in new species, but narrowing and oval (narrowing from base to apex) in *P. allardi*;

II. Dorsal colouration grassy green, shining in new species, but olive with just mild lustre in *P. allardi*;

III. Body shape in new species elongate, but with shorter appearance in *P. allardi*;

IV. Metasternum with punctuation and striolation in new species, but glabrous in *P. allardi*;

V. Male abdomen slightly impressed in new species, but flat in *P. allardi*;

VI. Mesometasternal process wide, in apex widely rounded and heading straight in new species, but more sharply developed with apex heading slightly downwards in *P. allardi*. Female of new species (as in males) lighter green, more shining, with ventral striolation in metasternum and densely punctured scutellum, but olive coloured and only mildly reflecting, missing any ventral striolation in metasternum and with impunctate scutellum in *P. allardi* females.

Pseudochalcotheomima compacta Janson and *Pseudochalcotheomima sammananni* Legrad & Chew Kea Foo stay more far with many different characters. Clypeal apical margin of the new species is shallowly emarginate, but rather deeply incised in *P. sammananni* and *P. compacta*. Black antennal club of males as long as pedicel in new species, but reddish antennal club of males in its congeners much longer than pedicel. Lateral borders of clypeus slightly widening to apex in new species, but parallel in *P. compacta* and *P. sammananni*. Dorsal and ventral punctuation more developed in both known species than in *P. legrandi* (disc of pronotum and elytra with fine punctures in *P. compacta* and *P. sammananni*, but glabrous in new species). Tibia and tarsi reddish in *P. compacta* and *P. sammananni*, but green in newly described species. Punctuation and striolation of metasternum present only in new species, but absent in both known species. Apex of mesometasternal process sharply pointed in *P. compacta* and *P. sammananni*, but wide and rounded in *P. legrandi*. Parameres of males differently structured, almost missing outer paramere rims in historically known species, but with wide outer paramere rims in new species.

Etymology. Named after my friend and colleague Jean-Philippe Legrand, who improved our knowledge about Cetoniinae beetles occurring in Borneo.

Distribution. Indonesia, SW Kalimantan, Mt. Bawang

TAXONOMICAL KEY TO MALES OF *PSEUDOCHALCOTHEOMIMA* MIKŠIČ

- 1 (4) Species with reddish legs, sharply incised apical margin of clypeus, parallel borders of head, fine punctation or striolation present throughout total length of pronotum and elytra, sharply pointed mesometasternal apex, elongate antennal club (longer than stalk), not enlarged apex of metatibia.
- 2 (3) Species with spur in front of metatibia apex. Pygidium with medially developed impression running from apex almost to base. Abdominal impression absent. *Pseudochalcotheomima compacta* Janson, 1912
- 3 (2) Species missing spur in front of metatibia apex. Pygidium with impression developed only in apical part. Abdominal impression shallow, but present. *Pseudochalcotheomima sammananni* Legrand & Chew Kea Foo, 2010
- 4 (1) Species with green legs, shallowly emarginate apical margin of clypeus, slightly widening lateral borders of head, glabrous pronotum and elytra disc, rounded mesometasternal apex, not elongate antennal club, enlarged metatibia apex.
- 5 (6) Olive green species with mild reflection. Body and legs moderately long, but not elongate. Abdomen flat, missing any impression. Mesometasternal process with apex moderately rounded, slightly heading downwards. Male parameres inner rims oval, narrowing from base to apex *Pseudochalcotheomima allardi* Antoine, 1990
- 6 (5) Grassy green species, rather strongly shining. Body and legs elongate. Abdomen with indistinctly developed impression. Mesometasternal process with apex widely rounded, heading straight. Male parameres inner rims parallel. *Pseudochalcotheomima legrandi* sp. nov.

TAXONOMICAL KEY TO FEMALES OF *PSEUDOCHALCOTHEOMIMA* MIKŠIČ

- 1 (2) Species with reddish legs, elongate and sharply pointed mesometasternal process, fine punctation of pronotum and especially elytra. *Pseudochalcotheomima compacta* Janson, 1912
- 2 (1) Species with green legs, short mesometasternal process with widely rounded apex, glabrous or almost glabrous disc of pronotum and elytra.
- 3 (4) Species with impunctate scutellum and metasternum, body olive green, lustre mild. *Pseudochalcotheomima allardi* Antoine, 1990
- 4 (3) Species with rather densely punctured scutellum and striolate metasternum (except disc), body grassy green, shining. *Pseudochalcotheomima legrandi* sp. nov.

Note. Female of *Pseudochalcotheomima sammananni* unknown, but probably can be close to *P. compacta*.

UPDATES LIST OF *PSEUDOCHALCOTHEOMIMA* SPECIES

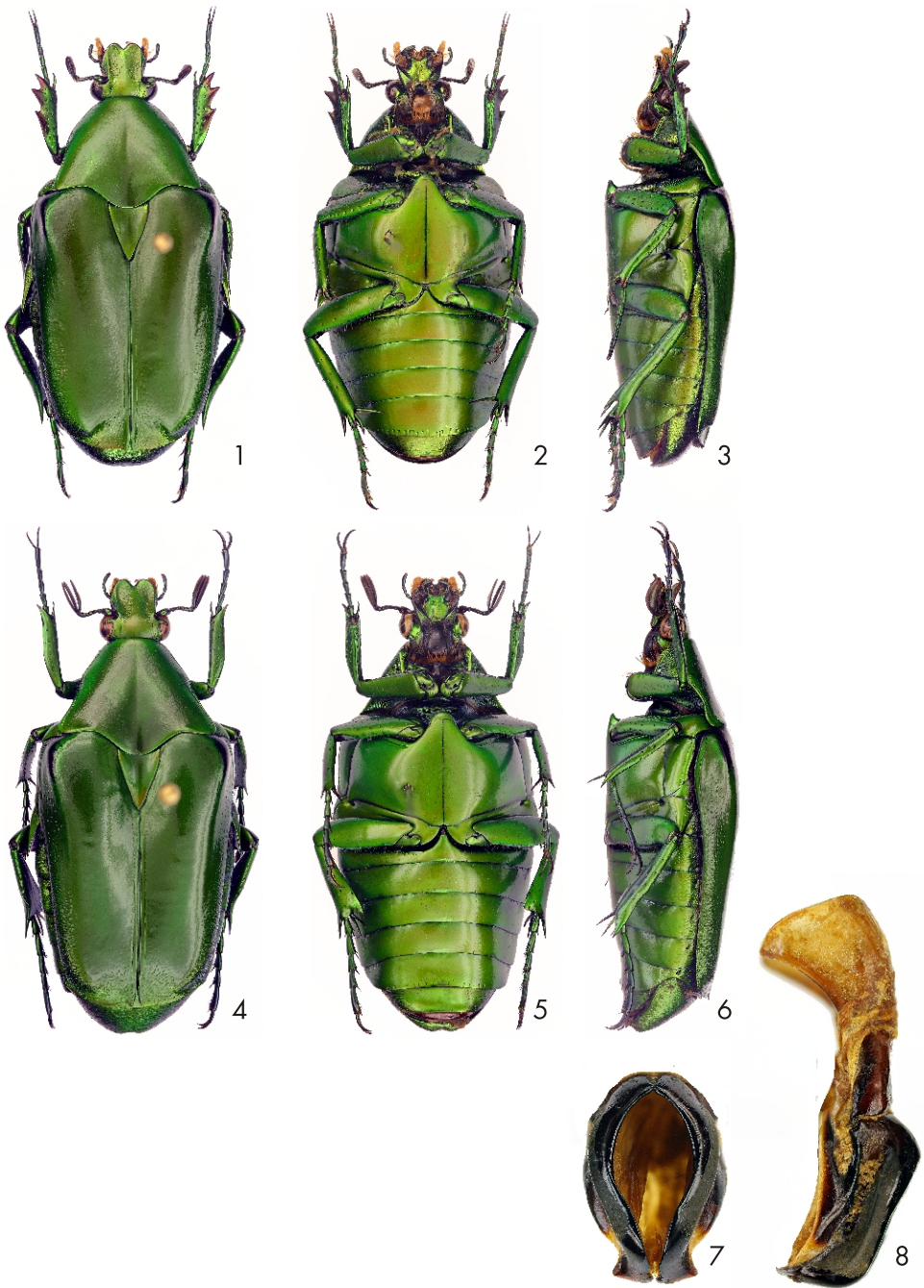
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Pseudochalcotheomima legrandi sp. nov.; D: Indonesia, SW Kalimantan: Mt. Bawang
Pseudochalcotheomima sammananni Legrand & Chew Kea Foo, 2010; D: Malaysia, Borneo, Sabah: Mt. Trus Madi

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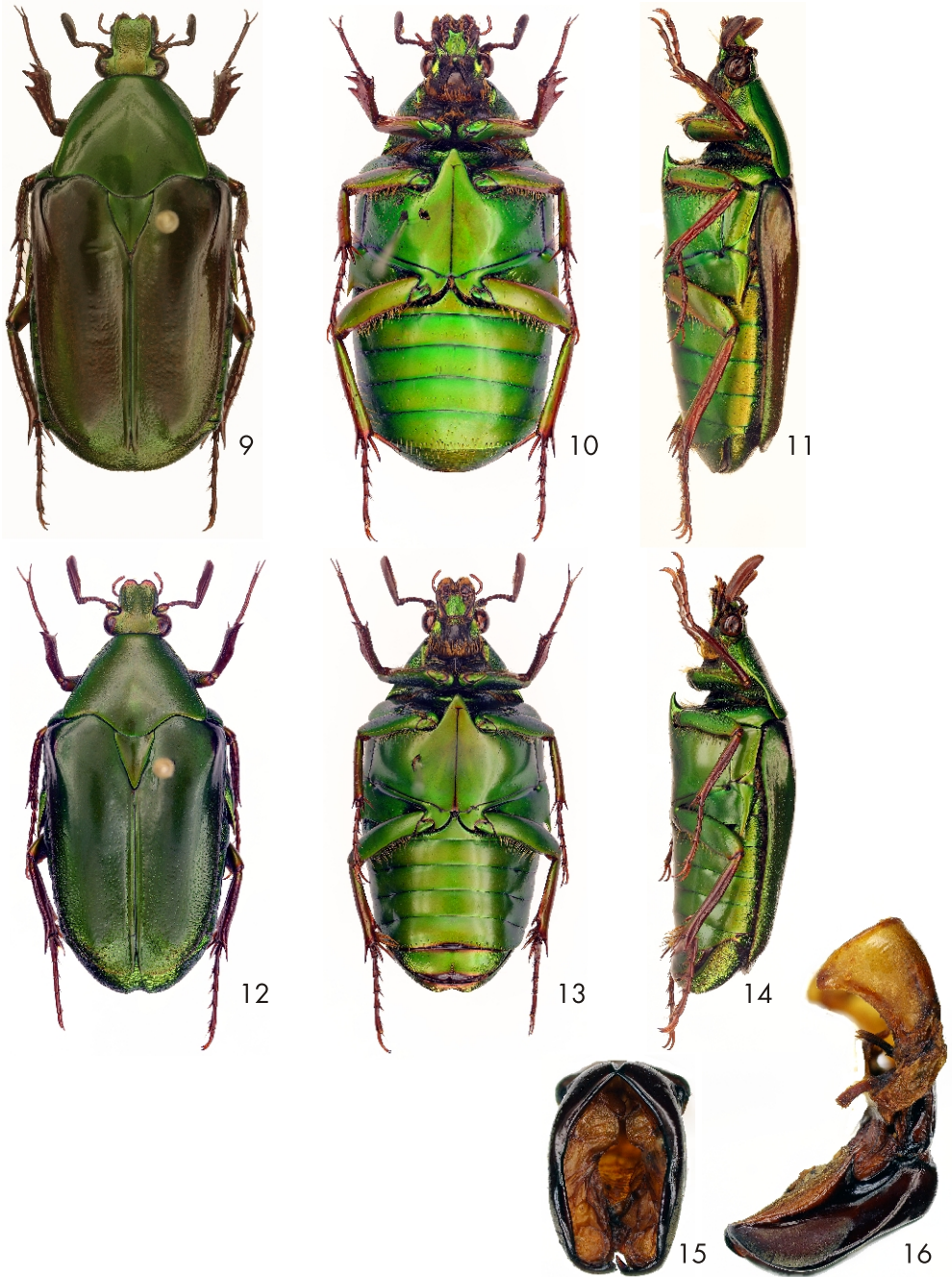
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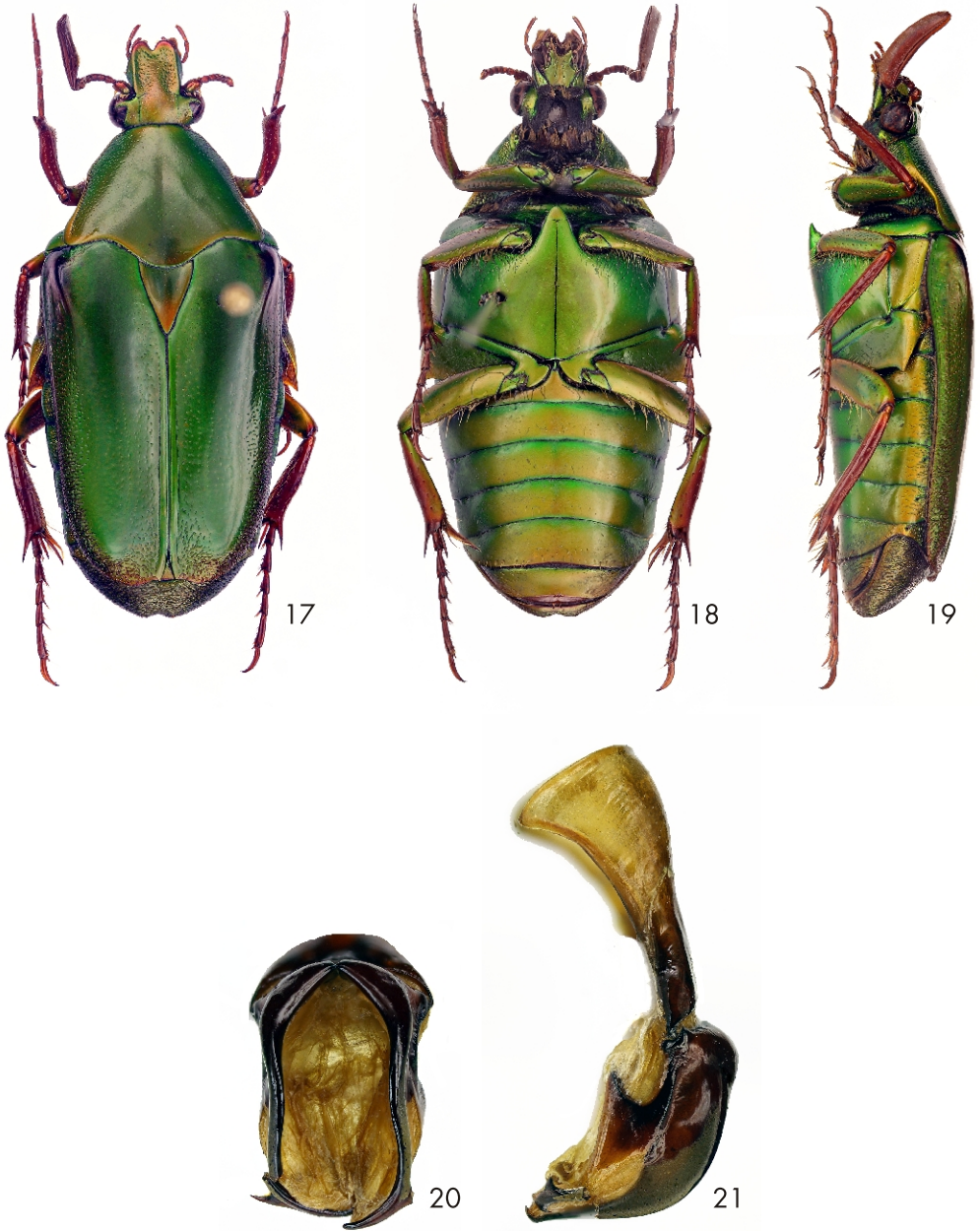
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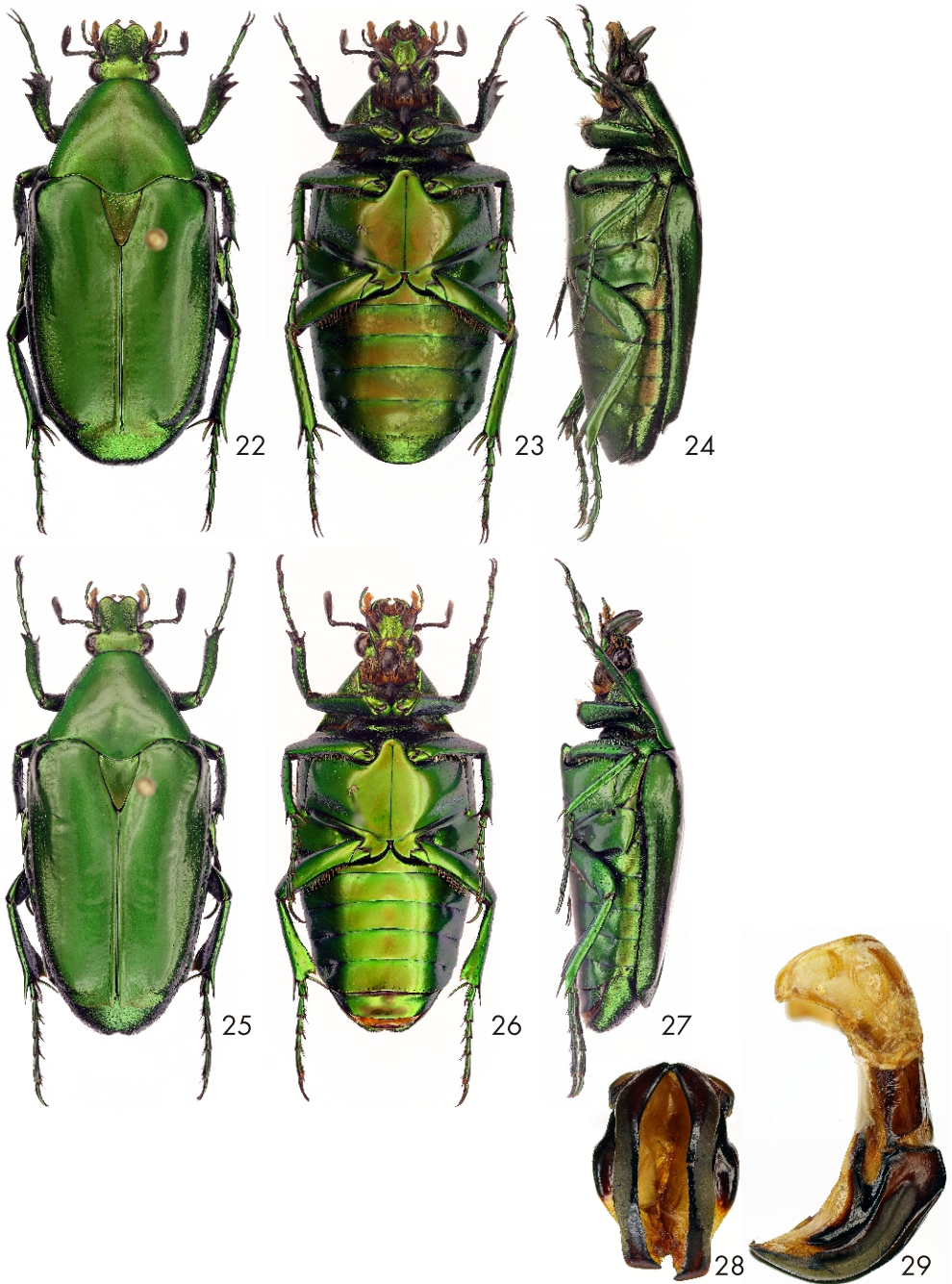
Figs. 1-8. *Pseudochalcotheomima allardi* Antoine, 1990: 1- habitus of female, dorsal aspect; 2- habitus of female, ventral aspect; 3- habitus of female, lateral aspect; 4- habitus of male, dorsal aspect; 5- habitus of male, ventral aspect; 6- habitus of male, lateral aspect; 7- aedeagus; 8- aedeagus lateral aspect.



Figs. 9-16. *Pseudochalcotheomima compacta* (Janson, 1912): 9- habitus of female, dorsal aspect; 10- habitus of female, ventral aspect; 11- habitus of female, lateral aspect; 12- habitus of male, dorsal aspect; 13- habitus of male, ventral aspect; 14- habitus of male, lateral aspect; 15- aedeagus; 16- aedeagus lateral aspect.



Figs. 17-21. *Pseudochalcotheomima sammananni* Legrand & Chew Kea Foo, 2010: 17- habitus of male, dorsal aspect; 18- habitus of male, ventral aspect; 19- habitus of male, lateral aspect; 20- aedeagus; 21- aedeagus lateral aspect.



Figs. 22-29. *Pseudochalcothemima legrandi* sp. nov.: 22- habitus of female, dorsal aspect; 23- habitus of female, ventral aspect; 24- habitus of female, lateral aspect; 25- habitus of male, dorsal aspect; 26- habitus of male, ventral aspect; 27- habitus of male, lateral aspect; 28- aedeagus; 29- aedeagus lateral aspect.