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THE ASIAN GENUS *PLEURONOTA* KRAATZ AND ALLIED FORMS: A CLARIFICATION (COLEOPTERA: CETONIIDAE)

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With 15 text-figures and one plate

ABSTRACT

Two Asian genera are diagnosed and their nomenclature is revised: *Pleuronota* Kraatz (= *Macronotiola* Mikšić, syn. nov.) and *Macronotops* nov. (= *Pleuronota* sensu Mikšić). Key frameworks for both genera and checklists of the known species are given. *Pleuronota allenii* sp. nov. (Borneo) is described and illustrated. Some new records are given. The following new combinations had to be made. To *Pleuronota*: *aenea* (Gestro), *elongata* (Gory & Percheron), *longiuscula* (Moser), *monticola* (Gestro), *rufosquamosa* (Fairmaire), *setosa setosa* (Moser), *setosa imuganica* (Mikšić) (all from *Macronotiola*), *patricia* (Gory & Percheron) (from *Macronota*); to *Macronotops*: *fulvoguttata* (Fairmaire), *fulvopilosa* (Fairmaire), *nigropubescentis* (Mikšić), *ovaliceps* (Arrow), *sexmaculata* (Kraatz), *vuilleti vuilleti* (Bourgoin), *vuilleti olivaceofusca* (Bourgoin) (all from *Pleuronota*).

Several species of Asian cetoniines placed in *Macronota* auctorum and *Pleuronota* Kraatz were recently re-arranged, keyed and described by Mikšić (1972, 1976). He proposed a new genus, *Macronotiola*, to accommodate some oddities up till then combined with *Macronota*. Because of a serious misinterpretation of the type-species concept, however, a mix-up took place, which is rectified below to prevent further confusion. The two genera involved are diagnosed, one is re-named, and all the species mentioned by Mikšić (l.c.), the type of *Pleuronota* excepted, are re-combined. Furthermore, one new and one old species are added to *Pleuronota*, and new records are given, mainly based on material kept in Leiden.

The key frameworks given below only provide a gross classification of the two genera. I have not attempted to devise exhaustive keys to all the species and subspecies recognized so far, for the following reasons: (1) my primary intention is to clarify the supraspecific classification; (2) the material studied

so far, also with the present additions, is extremely poor; (3) some type-specimens were not available for study.

The maps (figs. 14, 15) provide a reasonable approximation of the known distribution of these cetoniines.

Pleuronota Kraatz and **Macronotops** nov.

Group diagnosis. — Hairy but not bumblebee-like cetoniiiform beetles with strongly lobate pronotal base; if glabrous, species with coniform pygidium in male sex. Derm lacking velvety shine, usually with whitish markings. Clypeus never deeply incised.

Identification. — The two genera can be separated as follows:

	<i>Pleuronota</i>	<i>Macronotops</i>
1. <i>Clypeal margin anteriorly</i>	bisinate, not raised (fig. 1)	straight or rounded, raised (fig. 11)
2. ♂ <i>antennal club</i>	normal (fig. 9)	elongate (fig. 12)
3. ♂ <i>pygidium</i>	conical (fig. 7)	weakly convex
4. <i>Basal piece of phallus dorsally</i>	humped (fig. 10)	not humped (fig. 13)

Affinities. — *Pleuronota*, *Macronotops*, *Bombodes*, *Taeniodera*, *Euselates* and some other genera are all closely allied inter se, and, in my opinion, only a thorough phylogenetic analysis could clarify their relationships. At any rate, the bumblebee-like forms united in *Bombodes* Westwood are very close, and may eventually turn out to be closest to the two genera dealt with here.

Pleuronota Kraatz

Pleuronota Kraatz, 1892: 312 (monotypic: *Pleuronota octomaculata* Kraatz).

Macronotiola Mikšić, 1972: 123 (type-sp. *Macronota elongata* Gory & Percheron), 125 (key to species); 1976: 31 (in key), 152 (diagnosis), 153 (key to species). **Syn. von.**

Type-species. — *Pleuronota octomaculata* Kraatz, by monotypy.

Mikšić (1976) considers this species aberrant (sic), and terms its systematic position rather dubious. Considering the shape of the clypeus, however, *P. octomaculata* clearly belongs in his *Macronotiola*, while the other three characters mentioned above are consistent as well, as proved by the study of the male sex. Because the type-species of *Pleuronota* and *Macronotiola* are here considered congeneric, the latter name falls as a junior synonym. Mikšić's use of the term type-species implies that a type-species must be typical of the genus; there is, however, no such obligation in zoological nomenclature.

Distribution and composition. — Oriental Region (map, fig. 15); 9 species, one with two subspecies.

Key framework for *Pleuronota*

1. Pronotal midline distinctly impressed, in some cases limited by paramedian costae. Pronotal sides more or less angulate and posterolateral angles more or less distinct 2
— Only pronotal base may be superficially impressed. Pronotal sides and posterolateral angles widely rounded off
. *monticola* + *aenea* + *alleni* (see table under *alleni*)
2. Pronotal impression constricted about halfway pronotal length. Small species (length less than 15 mm) *elongata*
— Pronotal impression continuous 3
3. Dorsum shortly setose or glabrous *longiuscula*
— Dorsum abundantly setose, setae long or very long 4
4. Head posteriorly with longitudinal smooth costa. Paramedian costae of pronotum distinct *rufosquamosa* + *setosa*
— Head posteriorly lacking longitudinal smooth costa. Paramedian costae of pronotum indistinct 5
5. Colour more or less metallic. External denticles of fore tibia equally wide apart. Elytral apex lacking cretaceous marking *patricia*
— Colour generally black-brown. Distance between denticles 1-2 of fore tibia greater than between 2-3. Elytral apex with cretaceous marking *octomaculata*

Checklist of *Pleuronota* species ¹⁾

**aenea* Gestro, 1879: 11 (*Macronota*), type in Genoa. — Sumatra (type-loc. Singalan). — ♂ of *monticola*? — L.

alleni Krikken, present paper, holotype ♂. — Borneo (type-loc. [Mt Lingga]). — L.

elongata Gory & Percheron, 1833: 327 (*Macronota*), location of type not stated. — Malaysia, Singapore, Indonesia; type-loc. Calcutta apparently incorrect. — L.

longiuscula Moser, 1912: 565 (*Macronota*), type presumably in Berlin. — Celebes (type-loc. Bonthain). — L.

**monticola* Gestro, 1879: 12 (*Macronota*), type in Genoa. — Sumatra (type-loc. Singalan). — ♀ of *aenea*? — L.

¹⁾ An asterisk preceding a species-group name indicates that the status of the taxon concerned needs revision. Geographic names between square brackets could not be located with the necessary precision. The term type is applied if the original description does not contain information on the number of specimens on which it was based. L means that the species concerned is represented in the collections of the Leiden museum.

octomaculata Kraatz, 1892: 312, holotype ♀ in Eberswalde. — Java (type-loc. not detailed). — L.

patricia Gory & Percheron, 1833: 320 (*Macronota*), type in Dejean coll. — Java (type-loc. not detailed). — L.

rufosquamosa Fairmaire, 1893: 293 (*Taeniodera*), holotype in Paris. — North Vietnam (type-loc. Lang-Song).

setosa setosa Moser, 1914: 574 (*Macronota*), type ♂ in Berlin. — S Luzon (type-loc. Mt Banahao).

setosa imuganica Mikšić, 1972: 131 (*Macronotiola*, ♂ ♀), holotype ♂ in Berlin. — N Luzon (type-loc. Mt Imugan). — L.

Description, new records, other notes

Pleuronota elongata (Gory & Percheron)

Material examined. — 11 males, 9 females.

New localities: Java: Senggoro (nr Pasuruan); Kalimantan: Pontianak; Sumatra: Mana-Riang (nr Palembang); Pajakombo; Palembang; Seleleh (nr Kuala Limbang); Serdang. — Borneo: Mt Marapok. — West Malaysia: Penang.

Further new data: altitude 600 - 900 m (1 record); lowland forest (1 record); month iv (1 record).

Pleuronota longiuscula (Moser)

Note. — Janson left two males (now in Leiden museum) with a note “? = *nigerrima*, Wall.” (*Macronota*); this certainly has to be kept in mind. No new records: both specimens are from Bonthain (South Sulawesi).

Pleuronota rufosquamosa (Fairmaire)

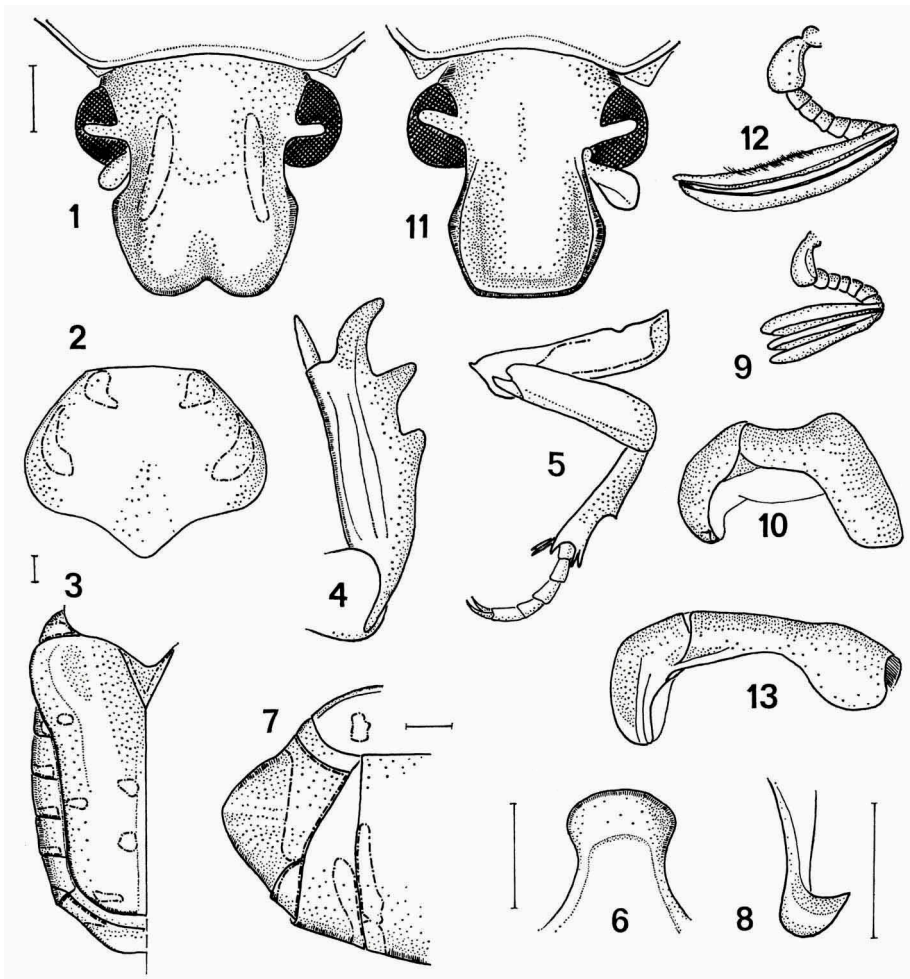
Note. — The remark in Mikšić's key (1976: 154, point 6) that the species is known from Laos is inconsistent with his remarks on pp. 158-159 (studied type-specimen only), and therefore may be a lapsus calami.

Pleuronota monticola (Gestro)

Material examined. — One female from Sumatra: Alahampandjang, i-1938, F. C. Drescher, 1500 m, from the Valck Lucassen collection in Leiden, reasonably agrees with the available descriptions. This may indeed be the female of *aenea*, as suggested by Mikšić (1976: 163).

***Pleuronota aenea* (Gestro) (fig. 17)**

Material examined. — One male from Sumatra: Mt Talong in the Padang highlands, 1895, A. Koller, originating from the Neervoort van de Poll collection, reasonably agrees with Gestro's diagnosis. This may indeed be the male of *monticola* (see above).



Figs. 1-13. Males of *Pleuronota alleni* (1-8), *P. octomaculata* (9-10), *Macronotops sexmaculata* (11-13). Contours of: 1, 11, head, full-face; 2, pronotum, dorsal; 3, left elytron, abdomen, dorsal view; 4, right fore tibia; 5, left hind leg; 6, process between middle coxae; 7, abdominal apex; 8, apex of right paramere; 9, 12, left antenna; 10, 13, phallus, dextrolateral view. Area inside dash-point marks cretaceous. Scale lines = 1 mm; 1, 9, 11, 12: same scale; 2, 3, 5: same scale; 4, 8: same scale; 7, 10, 13: same scale.

Pleuronota alleni sp. nov. (figs. 1-8, 16)

Description (holotype, male). — Approximate length 20, width 9.5, height 6.5 mm. Blackish brown, shiny, with whitish cretaceous markings; pilosity whitish, generally sparse and very short, indistinct; mouthparts, fore coxae, femora and anterior margin of prosternum with longer yellow setae. Derm predominantly punctate and striolate. Habitus, fig. 16.

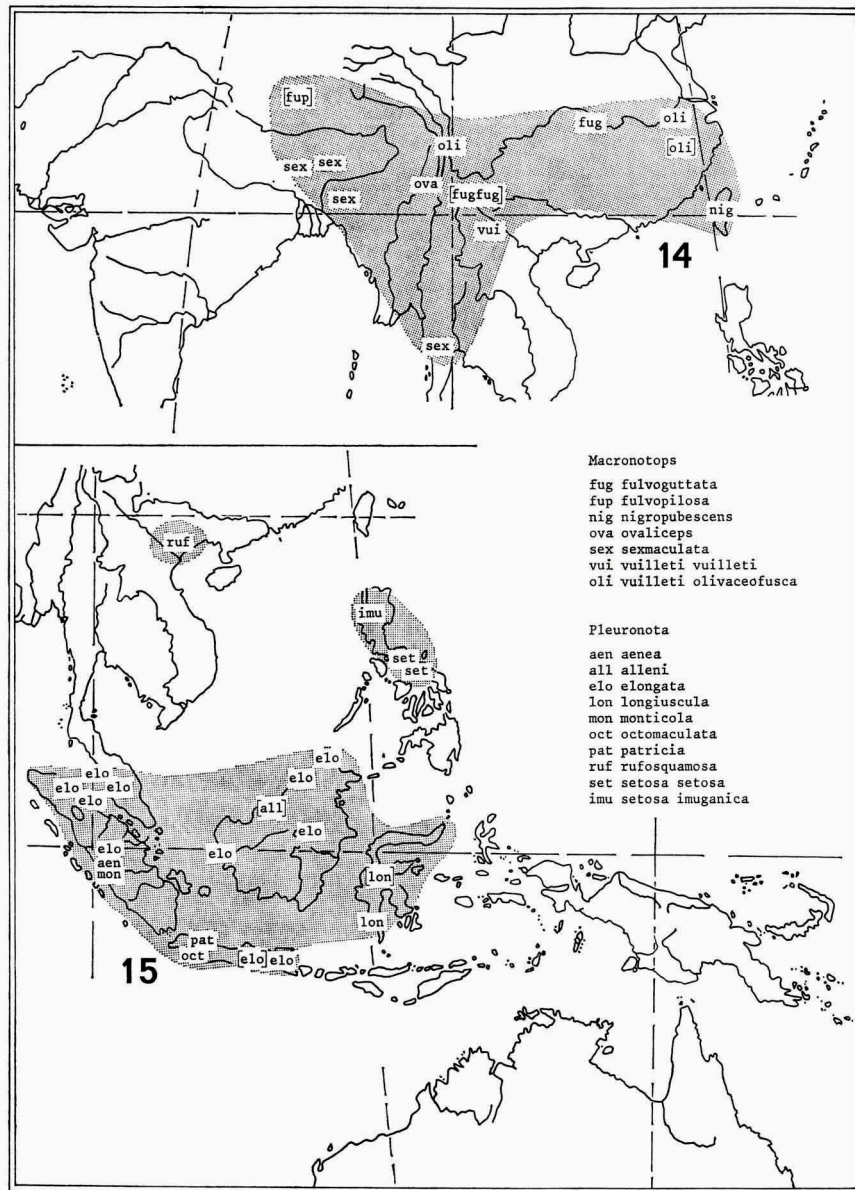
Cephalic contours and disposition of white markings, fig. 1. Clypeofrons medially convex, laterally more or less concave; entire head densely punctate, punctures fine, distinct, more or less elliptic and more or less asperate; densities of punctures medially between eyes ca 15/0.25 sq. mm, their diameters ca 0.10 x 0.05 mm. Maximum width of head capsule (including eyes) 3.65, of clypeus 2.60 mm.

Pronotal contours and disposition of white markings, fig. 2; pronotum feebly, evenly convex, mediobasal area very superficially depressed; lateral borders marginate, posterolateral angles fully rounded off. Derm of pronotum very densely punctate; punctures centrally isodiametric, with densities ca 8/0.1 sq. mm and maximum diameters ca 0.05 mm, laterally elliptic with densities ca 4/0.1 sq. mm and maximum diameters ca 0.15 mm. Median length of pronotum 5.5, maximum width 7.2 mm; ratio l/w 0.77. Scutellum (fig. 3) punctate, with cretaceous lateral margins.

Elytral contours and disposition of white markings, fig. 3; prediscal area depressed, juxtasutural zone posteriorly raised; humeral impression shallow; apex simply angulate; zone adjacent to juxtasutural costa with 2 complete and 1 incomplete longitudinal striolae; elytral disc sparsely punctate, humeral impression, parascutellar surface and base adjacent to pronotum densely punctate-striolate; lateral declivity densely transversely striolate. Sutural length of elytra 8.4, maximum (humeral) width combined 9.2, maximum (longitudinal) length 11.5 mm; ratio maximum l/w 1.15.

Antennal club short. Pectoral and abdominal parts with cretaceous markings as follows: lateral parts of propectus entirely; mesosternum, except posteromedially; mesepimeron ventrally and dorsoposteriorly; metasternal wings marginally; a pattern laterally on abdominal sternites 2-6, anal sternite (7) almost entirely (fig. 7); margins of pygidium dorsolaterally; and extensive markings on coxae. Abdominal sternites laterally braidedly striolate, other ventral parts abundantly punctate, mostly more or less hemipunctate. Pygidium (figs. 3, 7) coniform, transverse, its apex subtruncate (dorsal view); derm striolate, in such a way that squamiform units are produced. Propygidium finely striolate.

Fore tibia (fig. 4) tridentate; terminal spur long, acuminate, extending to apex of tarsal segment 2. Middle and hind tibiae (fig. 5) with one external



Figs. 14-15. Distribution of *Macronotops* (14) and *Pleuronota* (15); generic ranges shaded; approximate localities of species indicated by species acronyms; acronyms between square brackets: exact location unknown.

denticle; apex of middle tibia superiorly bidentate, hind tibia tridentate. Middle and hind femora slender; tarsi all slender, with large sickle-shaped claws.

Parameres with large hooked apex (fig. 8).

Identification. — Closely related to *Pleuronota aenea* and *monticola*, but easily identifiable from the following characters:

	<i>alleni</i> ♂	<i>aenea</i> ♂	<i>monticola</i> ♀
1. <i>Generally</i>	very plump	plump	plump
2. <i>Dorsum</i>	virtually glabrous	moderately setose	densely setose
3. <i>Pronotum</i>	with characteristic pattern of cretaceous markings	no such pattern	no such pattern
4. <i>Lobe of pronotal base</i>	subangulate	rounded	rounded
5. <i>Humeral impression</i>	vague	circumscript	circumscript
6. <i>Hind coxae</i>	rounded postero-laterally	angulate postero-laterally	angulate postero-laterally
7. <i>Parameres</i>	with distal-external hook	without distal-external hook	not applicable
<i>possibly sexual characters:</i>			
8. <i>Colour</i>	dark brown	dark brown, partly metallic	black-brown
9. <i>Elytron</i>	with at least five cretaceous spots	with two distinct cretaceous spots	with at least five cretaceous spots
10. <i>Pygidial base</i>	virtually glabrous	with short setae	with very long setae
11. <i>Pygidial base laterally</i>	with cretaceous marking	without cretaceous marking	with cretaceous marking

Material examined. — Holotype male only, from Mt Lingga, vi-1914, G. D. A[llen?], from Janson-Valck Lucassen collection, in Leiden. There are more Mt Lingga, but I assume the present one to be on Borneo: Sarawak, as Van Steenis-Kruseman (1950: 12) mentioned a Reverend G. Dexter Allen having collected on "Lingga Mt., Sarawak" before or during 1906. The name *alleni* was already used by Janson, who long ago recognized this specimen as representing a new species.

***Pleuronota octomaculata* Kraatz (figs. 9-10, 18)**

Material examined. — 1 male, 1 female, from Java: Sukabumi, 1893, Fruhstorfer, ca 600 m.

Pleuronota patricia (Gory & Percheron) (fig. 19)

Note. — This is the old species added to *Pleuronota* mentioned in the introduction. The full data of the material from Gunung Tangkuban Perahu given hereafter show how rare this species must be, as F. C. Drescher was a most industrious beetle collector.

Material examined. — 4 males, 2 females.

Indonesia: Java: Mt Tangkuban Perahu, iii-1891, Kannegieter; 11-iii-1900, 5-xii-1924, 13-xi-1929, xii-1936, 1200-1500 m, all Drescher (material partly in Amsterdam); Mt Tjikorai, 1893, Fruhstorfer, ca 1200 m — each of these records based on a single specimen.

Macronotops nov.

Pleuronota, Mikšić, 1976: 31 (in key), 164 (diagnosis; type-sp. *Pleuronota sexmaculata* Kraatz, incorrect designation), 166 (key to species).

Type-species. — *Pleuronota sexmaculata* Kraatz.

Mikšić, as a result of a complete misinterpretation of the type-species concept in zoological nomenclature, incorrectly designated *Pleuronota sexmaculata* Kraatz as the type-species of *Pleuronota*, thus forcing us to re-name this group (see remarks above, under *Pleuronota* Kraatz).

Distribution and composition. — Oriental and Palaeartic Regions (map fig. 14); 6 species, one with 2 subspecies.

Key framework for *Macronotops*

- | | |
|--|--|
| 1. Pilosity predominantly yellow or brown | 2 |
| — Pilosity predominantly black | <i>nigropubescens</i> |
| 2. Clypeus subquadrate, with raised anterior margin | 3 |
| — Clypeus elongate-elliptic | <i>ovaliceps</i> |
| 3. Posterolateral angle of hind coxae strongly produced | <i>sexmaculata</i> |
| — Posterolateral angle of hind coxae at most slightly produced | |
| | <i>vuilleti</i> + <i>fulvoguttata</i> + <i>fulvopilosa</i> |

Checklist of *Macronotops* species

- **fulvoguttata* Fairmaire, 1891: XI (*Macronota*), type presumably in Paris.
— Central and South China (type-loc. Chang-Yang). — L.
- **fulvopilosa* Fairmaire, 1894: 219 (*Taeniodes*), type presumably in Paris.
— Thibet (type-loc. [Tong-Hô valley]).
- nigropubescens* Mikšić, 1971: 208 (*Pleuronota*, ♂), holotype in Mikšić coll. — Taiwan (type-loc. Taiheizan).

ovaliceps Arrow, 1941: 83 (*Macronota*, ♂), holotype in London. — Burma (type-loc. Sima).

sexmaculata Kraatz, 1894: 141 (*Pleuronota*, ♀), type presumably in Paris. — India (type-loc. Darjeeling), Bhutan, Burma. — L.

vuilleti vuilleti Bourgoïn, 1916: 135 (*Macronota*, ♂), holotype in London. — North Vietnam (type-loc. Chapa). — L.

vuilleti olivaceofusca Bourgoïn, 1916: 136 (*Macronota*, ♂), holotype in London. — China (type-loc. Fo-kien, no detailed locality).

New records, other notes

Macronotops sexmaculata (Kraatz) (figs. 11-13, 20)

Material examined. — 2 males, 1 female. New locality: Burma: Tenasserim: Taungoo (1 ♂ — figured).

Macronotops vuilleti (Bourgoïn)

Notes. — The differences between *Macronotops vuilleti*, *olivaceofusca*, and *fulvoguttata* should be re-examined, but with the scanty material available, there is at present scarcely any point in doing this. If, as Mikšić (1976: 173) suggests, *fulvoguttata* is a subspecies in the aforesaid triplet, it has priority over Bourgoïn's names.

The type of *olivaceofusca* Bourgoïn is certainly not in Leiden, as Mikšić (1976: 173) writes.

Material examined. — 1 male from the type-locality in North Vietnam.

Macronotops fulvoguttata (Fairmaire) (fig. 21)

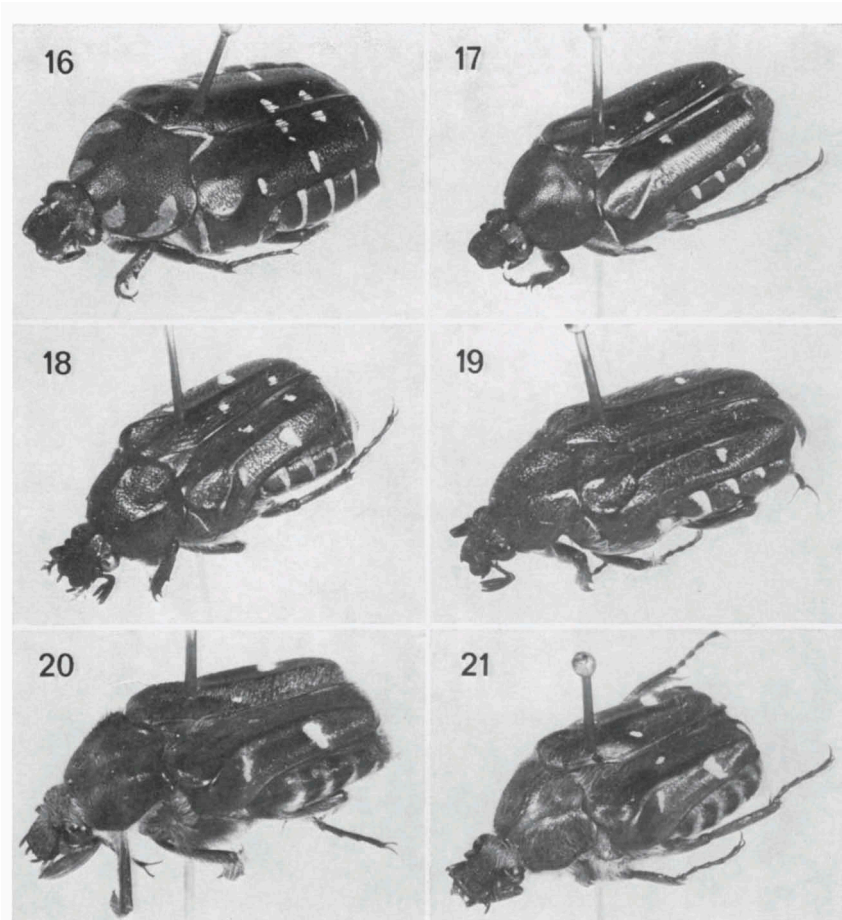
Material examined. — 2 males, 2 females.

The position of these specimens should be checked in the future. New records: China: E Yunnan: Sse-Tsong, 1200 m (1 ♂ — figured; 1 ♀), and NW Yunnan: Djo-Kou-La, 2000 m (1 ♂, 1 ♀).

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Males of *Pleuronota* and *Macronotops*. 16, *P. alleni*, holotype, 20 mm; 17, *P. aenea*, Mt Talang, 17 mm; 18, *P. octomaculata*, Sukabumi, 18 mm; 19, *P. patricia*, Mt Tangkuban Perahu, 18.5 mm; 20, *M. sexmaculata*, Taungoo, 19 mm; 21, *M. fulvoguttata*, Sse-Tsong, 17 mm.