

ZOOLOGISCHE MEDEDELINGEN

UITGEGEVEN DOOR HET

RIJKSMUSEUM VAN NATUURLIJKE HISTORIE TE LEIDEN
(MINISTERIE VAN CULTUUR, RECREATIE EN MAATSCHAPPELIJK WERK)

Deel 54 no. 8

5 oktober 1979

TAXONOMIC REVIEW OF THE AFROTROPICAL GENUS *HYPSELOGENIA* BURMEISTER (COLEOPTERA: CETONIIDAE)

by

J. KRIKKEN

Rijksmuseum van Natuurlijke Historie, Leiden

With 13 text-figures and one plate

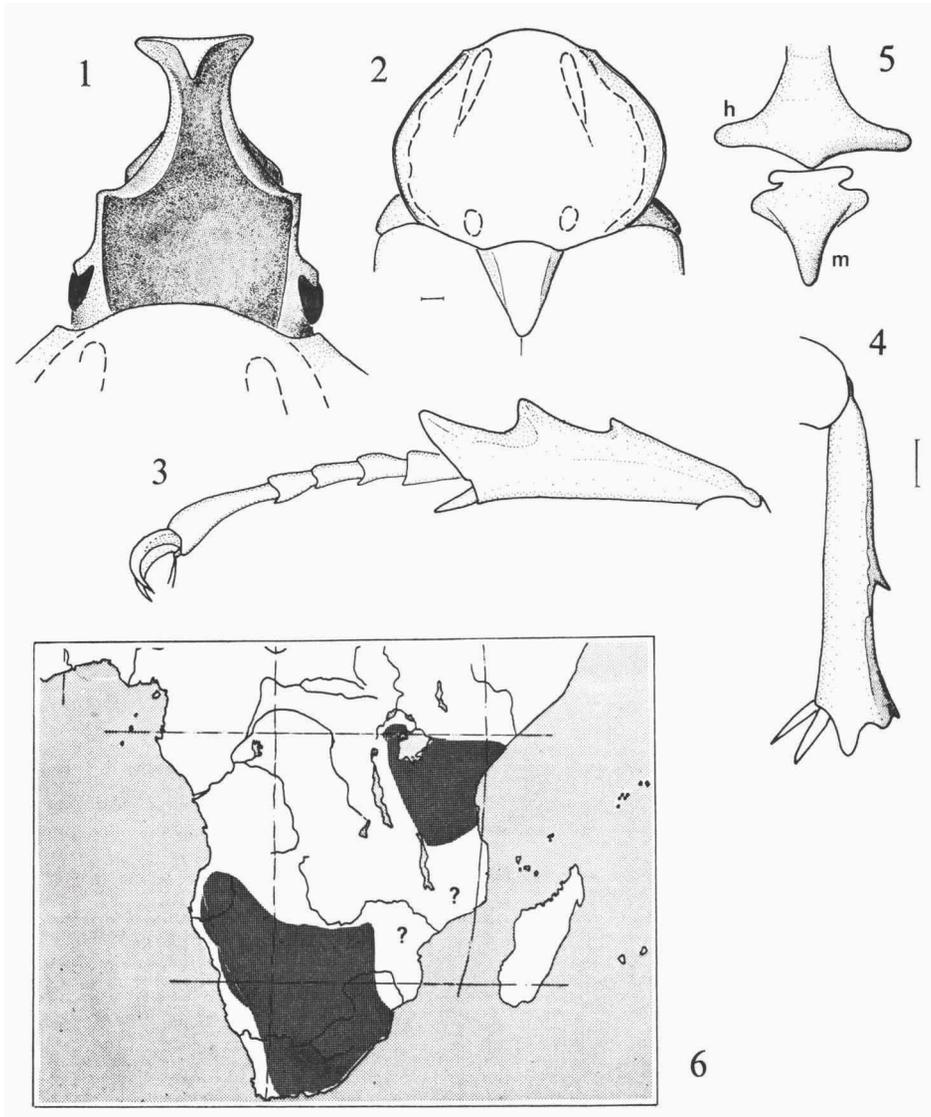
ABSTRACT

The Afrotropical genus *Hypselogenia* Burmeister is diagnosed and discussed. The characters of the species and varieties are examined, and presented in a synoptic table and in an analytical key. An annotated checklist of the species and varieties is given. The Leiden collection is fully recorded. Four species are recognized. In one species three varieties are recognized, which were previously regarded as species or subspecies.

INTRODUCTION

This paper is part of a proposed series of reviews resulting from current work toward a generic reclassification of the subfamily Cetoniinae. Although much work has to be done before a coherent picture of the supraspecific relationships can be produced, it seems useful to sort out the information now available on particular genera, adding new observations based on material kept in the Leiden museum. Occasionally, of course, material from other collections has to be studied, but as a rule, in view of the primary objective indicated above, species-level research has to be limited, i.e. to the Leiden collection; readers are therefore invited to communicate locality records, etc. based on other collections. Some genera, as well as certain intergeneric and infrageneric items, have been and will be treated separate from this series of reviews.

The present review deals with the Afrotropical genus *Hypselogenia* Burmeister, 1840. The genus is diagnosed and discussed, and its range is mapped. The characters of the species and varieties are examined, and presented in both a synoptic table and an analytical key. An annotated checklist of the species and varieties is given. This is followed by notes on each of the species and varieties, including the label data drawn from the Leiden collection.



Figs. 1-5. Contours of: 1-4, *Hypselogenia geotrupina*, ♂ Salisbury; 5, *H. nyassica*, ♂ Kidugalla. — 1, head, dorsal view; 2, pronotum, scutellum, mesepimera, dorsal view; 3, right fore tibia and tarsus; 4, left hind tibia; 5, clypeus and mentum, ventrofrontal view, palpi omitted, m = mentum, h = hypostomal protrusion. — Scale-line = 1 mm; 1, 3-5, same scale. Fig. 6. Approximate known range of *Hypselogenia* in Africa.

Before presenting the facts a few words about the genus concept seem appropriate. Although I am convinced that the species-groups ranked as genera in this and forthcoming reviews are strictly monophyletic, a future phylo-

genetic analysis might in a broader context lead to a different rank. For the time being my policy is to start from the smallest apparently homogenous units in the conventional system (i.e. the genera as listed by Schenkling, 1921), or from any acceptable revision, hoping to be able to connect the separate units later on. It should be noted that the suprageneric classification of Schenkling is not supported by any serious taxonomic discussion.

Hypselogenia Burmeister

This study was directly prompted by my conclusion that the classification given by Schein (1960) is most erroneous, because of the misinterpretation of a species-group name, and because of the few characters he used. I found that at least 16 characters can be used for identification to species and varieties, and consider that four species plus some varieties should be recognized, instead of two species with three subspecies each, as suggested by Schein.

Generic diagnosis. — General surface of head concave; anterolateral angles of clypeus dentiform (♀), or clypeus medially with long upbent horn (♂) (figs. 1, 12, 13). Vertex concave, hidden under pronotal apex. Dorsal outline of pronotum transversely elliptic (fig. 2), with more or less distinct anterolateral angles. Scutellum elongate-triangular, with rounded apex and impressed sides (fig. 2). Mentum bilobate in front, disc with variably developed protrusion (fig. 5, m). Segments 1 of all tarsi, especially fore tarsi, longer than segments 2 (fig. 3). Middle coxae distinctly separated by short meso-metasternal protrusion, which is rectangular in profile, rounded in ventral view.

General surface of pronotum evenly convex; pronotal base in front of scutellum at most shallowly emarginate; lateral border of pronotum completely ridged, noto-pectoral transition abrupt. General surface of elytra evenly convex, disc striate-punctate; apicosutural angle of elytron distinct; post-humeral emargination very shallow; humeral and apical umbones poorly pronounced. Antenna with claviform scapus, lamellae about as long as segments 2-7 combined. Prosternum unmodified. Mesosternal collum unmodified. Mesepimeron in dorsal view broadly convex. Metasternal disc flat, with finely impressed midline. Abdomen with 6 distinct sternites; dorso-ventral transition of sternites gradually convex, invisible from above. Pygidium transverse, general surface feebly convex, usually invisible from above. Fore-tibia with 3 external denticles, underside unmodified; terminal spur simply acuminate. Middle and hind tibiae with external protrusion; their apex bilobate and trilobate, respectively. Femora unmodified. Hind coxa invisible

from above; lateral extremity ridged; posterolateral angle subdistinct, obtuse. Tarsi all long and slender, with large sickle-shaped claws. Parameres simply lobiform, distally more or less tapering. Habitus robust, somewhat dynastoid; total length 1.5-3 cm; dark brown to black with white cretaceous markings. Microsculpture generally consisting of punctures; pilosity brownish, generally sparse. Sexual dimorphism primarily evident in shape of clypeus. — Larva, cf. Oberholzer, 1959.

Type-species. — *Diplognatha concava* Gory & Percheron, 1833, by present designation.

Affinities. — The position of *Hypselogenia* has been the subject of some debate (e.g., Kraatz, 1880). Its current position in the Ischnostomina (Schenkling, 1921; Schein, 1960; cf. also Krikken, 1978) seems to me less satisfactory than the one considered by Burmeister (1840, 1842) and some subsequent authors, i.e. near *Goliathus* Lamarck. Some of the features mentioned in the first paragraph of the above diagnosis are unusual among Cetoniinae, and their combination renders *Hypselogenia* remote from any genus known to me. Only a critical analysis of the suprageneric groupings within the subfamily can help to clarify the affinities of *Hypselogenia*.

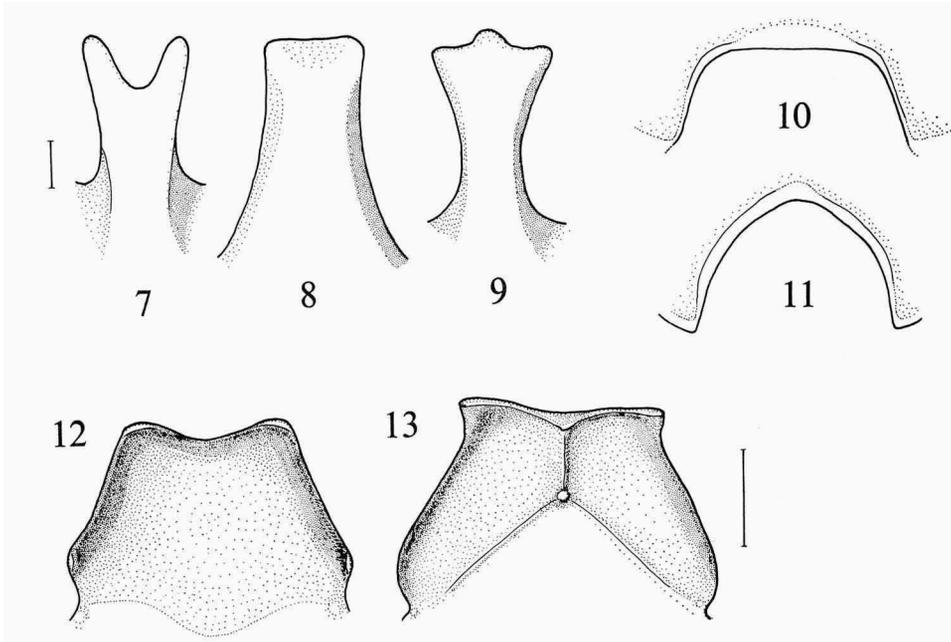
Infrageneric classification. — An analysis of the more important characters of *Hypselogenia* species and varieties is presented in the synoptic table further below. Scarcely any of these characters is capable of a phylogenetic interpretation. Only an apparent trend in the variation of the dorsal colour patterns could be interpreted as a sign of speciation. Obviously, two species-groups can be recognized, the *corrosa* and *geotrupina* groups (cf. key couplet 1). Within each of these groups a modification or regression of the dorsal cretaceous patterns seems to have taken place, viz. from *H. nyassica* to *corrosa* (compare plate 1 figs. 1, 2), and from *billbergii* (apparently with a complete pattern, plate 1 fig. 3) to the varieties of *geotrupina* (compare plate 1 figs. 4-6). This arrangement is fully supported by the other characters listed in the synoptic table.

Distribution. — The combined ranges of the four known species extend from Kenya to Angola and the Cape. Map, fig. 6. There is a large gap between eastern and southern Africa.

Bionomics. — Flying round manure heaps, near cattle kraals; also feeding on *Acacia* gum (Péringuey, 1907). Third-stage larva described by Oberholzer, 1959.

SYNOPTIC TABLE OF CHARACTERS

The following characters proved to be most useful in the delimitation of species and varieties:



Figs. 7-13. Contours of: 7-9, clypeal horn of male, frontal view; 10-11, apical arc of pronotum, frontal view; 12-13, clypeus of female, dorsal view. — 7, 11, *Hyselogenia corrosa*, "Luitpoldkette"; 8, *billbergii*, E. Africa; 9, 10, *geotrupina*, Salisbury; 12, *corrosa*, Kenya (B.E.A.); 13, *geotrupina*, S. Africa. — Scale-line = 1 mm; 7-11, same scale; 12-13, same scale.

*1a, apex of clypeal horn (δ) bifurcate (fig. 7); b, tridentate (figs. 1, 9; indistinct in fig. 8).

*2a, constriction of clypeal horn (δ) very distinct (figs. 7, 9); b, feeble or absent (fig. 8).

*3a, hypostomal angle of clypeus (δ) strongly projecting laterad (fig. 5, h); b, not strongly projecting laterad.

4a, lateral angle of clypeus (δ) strongly elevated; b, at most slightly elevated.

*5a, clypeus of ♀ concave, unmodified (fig. 12); b, with Y-shaped ridges (fig. 13).

6a, frons of ♀ unmodified; b, with callosity.

7a, pilosity on frontovertex moderately dense; b, very dense.

8a, frontovertex on each side with cretaceous patch (pl. I figs. 1, 2); b, without cretaceous patch.

*9a, pronotal apex in frontal view semicircular (fig. 11); b, transverse, more or less semielliptic (fig. 10).

*10a, pronotal apex (δ) in dorsal view bisinuate; b, broadly lobate (fig. 2).

*11a, pronotum with complete paramedian cretaceous lines ; b, with incomplete paramedian lines; c, without paramedian lines (pl. 1).

*12a, pronotum laterally with very broad cretaceous zone; b, with narrow zone; c, without cretaceous zone (pl. 1).

*13a, cretaceous markings on elytral disc numerous, large, separated by less than their own diameters, distal cretaceous zone present; b, ditto, but separated by more than their own diameters; c, all cretaceous markings absent (or nearly so); d, cretaceous markings transversely "corroded".

14a, longitudinal costae on elytral disc distinct; b, indistinct or absent.

*15a, cretaceous markings on pygidium large, separated by less than their maximum length; b, small, separated by more than their maximum length; c, absent.

*16a, protrusion of mentum with simple apex (fig. 5, m); b, with bifid apex.

Characters marked with an asterisk appear in the analytical key. The distribution of the above-mentioned character states over the respective species and varieties is tabulated hereafter.

| | characters | | | | | | | | | | | | | | | |
|---------------------------|------------|---|---|---|---|---|---|---|---|----|-----|-----|-----|----|-----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | states | | | | | | | | | | | | | | | |
| <i>corrosa</i> | a | a | b | b | a | a | a | a | a | a | c | a/b | d | a | a | a |
| <i>nyassica</i> | a | a | a | b | a | b | a | a | a | a | c | a | b | b | c | a |
| <i>billbergii</i> | b | b | b | a | b | a | b | b | b | b | a | b | a | b | a | b |
| <i>g. var. geotrupina</i> | b | a | b | a | b | a | b | b | b | b | a/b | b | a/b | b | b | b |
| <i>g. var. goryi</i> | b | a | b | a | b | a | b | b | b | c | b | b | b | b | b/c | b |
| <i>g. var. concava</i> | b | a | b | a | b | a | b | b | b | c | b/c | c | b | c | b | b |

KEY TO SPECIES AND VARIETIES

For additional characters see synoptic table above, and paragraphs on identification below, under the respective species headings.

- 1. Apical border of pronotum in frontal view very high, outline approximately semicircular (fig. 11), in dorsal view bisinuate (♂). Clypeal horn of ♂ with bifurcate apex (fig. 7); clypeus of ♀ simply concave, bidentate in front (fig. 12). Protrusion of mentum with simple apex (fig. 5) *corrosa* group, 2
- Apical border of pronotum in frontal view less high, outline approximately transversely semielliptic (fig. 10), in dorsal view broadly lobate (♂; fig. 2). Clypeal horn of ♂ with tridentate apex (figs. 1, 9); clypeus of ♀ with Y-shaped ridges (fig. 13). Protrusion of mentum with two-topped apex *geotrupina* group, 3

2. Elytral disc with numerous fine "corroded" cretaceous spots (plate 1 fig. 2). Pygidium usually with large cretaceous markings, one on each side. Hypostomal angles of ♂ at most slightly projecting . . . *corrosa*
 — Elytral disc with entire cretaceous spots (plate 1 fig. 1). Pygidium usually without cretaceous markings. Hypostomal angles of ♂ strongly projecting (fig. 5) *nyassica*
3. Clypeal horn of ♂ not constricted (fig. 8), slightly bent upward. Elytra with large cretaceous markings (plate 1 fig. 3). Pygidial cretaceous markings large, narrowly separated *billbergii*
 — Clypeal horn of ♂ distinctly constricted, i.e. sides distinctly concave (fig. 9), strongly bent upward. Elytral and pygidial markings reduced or even absent (plate 1 figs. 4-6). A most variable species *geotrupina*, 4
4. Paramedian lines on pronotum present, though usually interrupted; lateral cretaceous zone broad. Markings on elytral disc separated by approximately their own diameter; distal cretaceous zone broad. Pygidium usually with pair of small lateral markings var. *geotrupina*
 — Paramedian lines on pronotum absent; lateral cretaceous zone narrow. Markings on elytral disc small, remote; distal cretaceous zone absent. Pygidial markings absent var. *goryi*
 — Paramedian lines on pronotum absent; lateral cretaceous zone narrow or absent. Elytra without cretaceous markings, apart from narrow distal zone. Pygidial markings absent var. *concava*

ANNOTATED CHECKLIST

Each valid species-group name, is followed by: author and reference to first description; original status, if different from present; (reputed) location of type(s), any synonyms, approximate distribution, type-locality. An asterisk before a species-group name indicates that the taxon concerned has been found to need further revision.

For references to more literature Schenkling's catalogue (1921) should be consulted; I worked with the late F. T. Valck Lucassen's extensively supplemented copy. In this review, in addition to the undermentioned references, only the more substantial papers and further pertinent literature are cited.

Hypselogenia Burmeister, 1840: no. 40, 3 species-group names included; type-sp. *Diplognatha concava* Gory-Percheron (present designation). — Afrotropical, 4 spp. — Latest synopsis: Schein, 1960.

Described species and varieties

billbergii Thomson, 1878: 7, type ♂ in Paris. — Southern and eastern Africa, data imprecise (type-loc. in "Africa meridionalis").

corrosa Bates, 1881: 156, type ♀ in British Museum. Syn. *Hypselogenia actaeon* Gerstaecker, 1884. — Kenya, Tanzania (type-loc. Mamboia & Mpa-wapwa), Uganda.

geotrupina (Billberg, 1817: 46, as species of *Cetonia*), type cf. Copenhagen. — Southern Africa (type-loc. "Cap. bon. Spei").

g. var. *geotrupina*, as above. Syn. *Diplognatha albopunctata* Gory & Percheron, 1833. — Southern Africa (as above).

**g.* var. *concaua* (Gory & Percheron, 1833: 51, as species of *Diplognatha*), ♂♀ types cf. Geneva, Paris. — Southern Africa (type-loc. in "Cap de Bonne-Espérance").

**g.* var. *goryi* Thomson, 1878: 8 (as species), ♂ type in Paris. — Southern Africa (type-loc. in "Caffraria").

nyassica Kriesche, 1921: 123, ♂♀ types cf. Berlin. — South Tanzania (type-loc. Kidugalla).

DIAGNOSTIC NOTES, RECORDS, ETC.

All the specimens mentioned below are in the Rijksmuseum van Natuurlijke Historie, Leiden, abbreviated L. Two further abbreviations concerning collections incorporated in L are:

J — O. E. Janson (collection acquired by Valck Lucassen in 1928).

VL — F. T. Valck Lucassen (collection acquired by L in 1940).

Approximate total lengths were measured with head of beetles extended; for the males the length is given as a (length without clypeal horn) + b (length of clypeal horn).

***Hypselogenia corrosa* Bates (figs. 7, 12, pl. 1 fig. 2)**

Identification. — This species is easily distinguished by the fragmented, "corroded" appearance of the elytral markings; very occasionally these markings are completely absent. In both sexes *H. corrosa* differs from its closest relative, *nyassica*, by the slightly but distinctly elevated longitudinal costae of the elytral disc. The males of *corrosa* never have the hypostomal angles of the clypeus (fig. 5, h) strongly produced laterad, as in *nyassica*. The clypeo-frontal transition of the females of *corrosa* show a distinct callosity.

Note. — The "Nominatform" of *H. billbergii* sensu Schein (1960: 89), from Usambara, seems to be some variety of *corrosa*.

Material in L. — 55 specimens.

Kenya: Ikutha (3 ♂, 2 ♀); Kibwezi, partly xii.1921, 900 m (7 ♂, 6 ♀); Lamu (2 ♂, 2 ♀); "Luitpoldkette" (4 ♂, 3 ♀). — Tanzania: Dar-es-Salaam

(1 ♀, without cretaceous markings); Iringa (1 ♂, 1 ♀); Mt. Kiborini, 1907, 1500 m (1 ♂, 1 ♀); Masailand (1 ♂); Tosaurauga (2 ♂, 1 ♀). Usagara, 1913 (1 ♀). — Uganda: Mabira (2 ♂, 4 ♀) (there are several Mabira in Uganda!). — British East Africa (cf. Kenya) (1 ♂, 6 ♀). — East Africa (1 ♀). — Illegible locality (1 ♂, 1 ♀).

Collections included: VL, J, Clermont, Gérard, Hauser, Heyne, Kricheldorf, Neervoort van de Poll, Van Roon, Staudinger, Van der Vaart, Veth, De Vos tot Nederveen Cappel.

Length ♂ 18+3 — 28+4.5, ♀ 18.5 — 27 mm.

Hypselogenia nyassica Kriesche (fig. 5, pl. 1 fig. 1)

Identification. — *H. nyassica* is close to *corrosa* but differs in characters of the elytral disc (both sexes), in the clypeo-frontal transition (females), and in the direction of the hypostomal protrusions (males, fig. 5, h). The cretaceous pattern approaches that of *billbergii* and *geotrupina*, but the clypeal structure of those species is in both sexes very different.

Note. — Moser (1921) also described this species under the name *H. nyassica*, apparently slightly later, so that Kriesche must be considered the author.

Material in L. — 5 specimens.

Tanzania: Kidugala (Uheheland) (1 ♂, 1 ♀, ex VL-Hauser); Nyassa (2 ♂, 1 ♀, ex VL-Gérard).

Length ♂ 22.5+4 — 24.5+4.5, ♀ 23.5 — 24 mm.

Hypselogenia billbergii Thomson (fig. 8, pl. 1 fig. 3)

Identification. — This species was misinterpreted by Schein (1960) as a subspecies related with *corrosa* and *nyassica*. The synoptic table given above clearly shows the numerous differences with those species. The clypeal horn of *billbergii*, although essentially similar to that of *geotrupina*, has a different frontal outline, and is less reflexed (compare pl. 1 fig. 3 with figs. 4-6). The identification of *billbergii* females remains difficult: they seem to differ mainly in the greater extension of the cretaceous markings on pronotum, elytra and pygidium, compared to females of *geotrupina*.

Material in L. — 4 specimens, without detailed data: East Africa (1 ♂, 1 ♀, ex VL-J), South Africa (1 ♂, ex VL-J; 1 ♀ ex VL-J- Van de Poll).

Length ♂ 2.3+3.5 — 25 + 4, ♀ 24 — 25 mm.

Hypselogenia geotrupina (Billberg) (figs. 1-4, 9, 10, 12, pl. 1 figs. 4-6)

Identification. — The shape and direction of the clypeal horn is the outstanding character of *H. geotrupina* males. Females seem only distin-

guishable from those of the closely related *billbergii* by the apparent regression of the cretaceous patterns on pronotum, elytra and pygidium, which also applies to the males (compare pl. 1 figs. 4-6 with fig. 3). For three stages in this regression varietal names are maintained here (see key triplet 4 and synoptic table).

Variation. — I refrain from simply discarding the names available for the three aforesaid easily recognizable stages in the regression of the cretaceous patterns (pl. 1 figs. 4-6). These names were originally proposed as species names. Schein (1960) attributed them subspecific rank. I propose to consider the three stages varieties, because (1) the differences between them seem gradual; (2) they seem to occur mixed throughout the entire species range; (3) their frequencies in the various populations have to be examined before any conclusions about a possible subspecific status can be reached. There is also some variation in the development of the clypeal horn of the males, but this seems taxonomically less significant than the variation in the cretaceous patterns.

Material in L. — 32 specimens.

var. *geotrupina* Billberg:

Angola: Humpata (1 ♂ 1 ♀, without the pygidial markings). — South Africa: Magalies Mts (1 ♀). Natal (1 ♀). Transvaal (1 ♂, 1 ♀). — Rhodesia: Matoppa Hills (♂, 2 ♀); Salisbury (1 ♂, 1 ♀), 19.i.1921 (1 ♂). — South Africa (2 ♂, 2 ♀), southern Africa (1 ♀).

var. *goryi* Thomson:

South Africa: Beaufort-West (1 ♀); Colesberg (1 ♂). — South Africa (1 ♂, 1 ♀).

var. *concava* Gory & Percheron:

Namibia: Windhoek (1 ♂, 1 ♀). — South Africa: Newcastle: Roseland Estate (1 ♂, 1 ♀); Umkomaas River, ix.1897 (1 ♂). Transvaal (2 ♀). — South Africa (2 ♀).

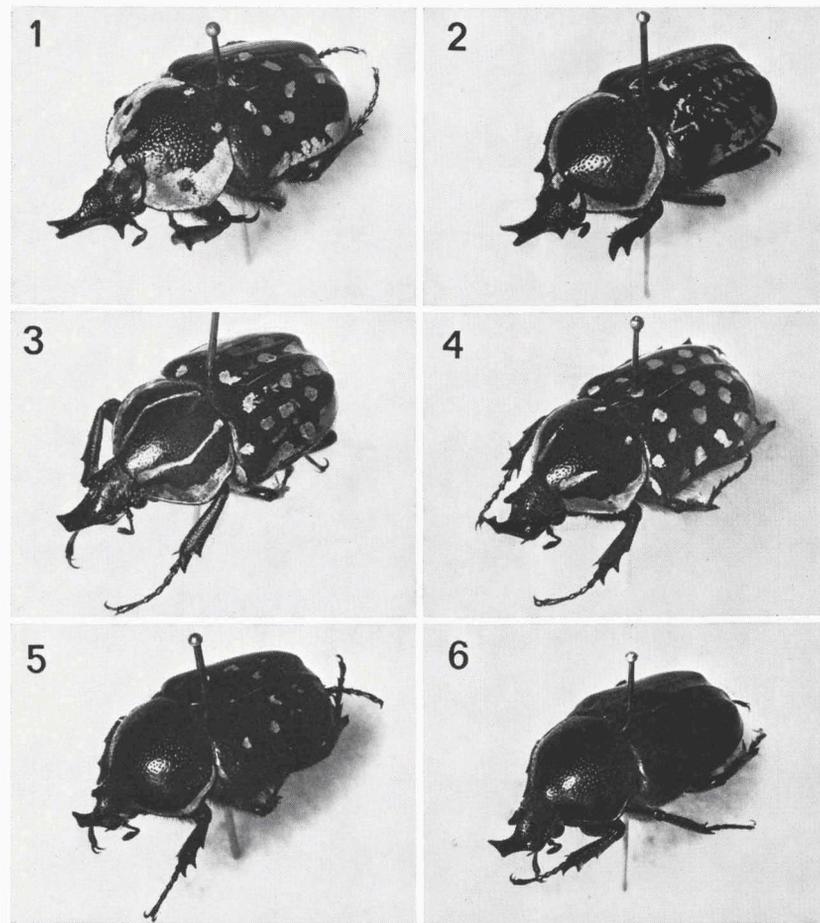
Collections included: VL, J, Armitage, Donovan, Gérard, Kricheldorf, Staudinger, Turner.

Length ♂ 17.5 + 1 — 26 + 3 mm, ♀ 18 — 24.5 mm.

REFERENCES

- BATES, H. W., 1881. New Cetoniidae from East Central Africa. — Ent. mon. Mag., 18: 156-157.
 BILLBERG, G. J., 1817. In: C. J. SCHÖNHERR, Synonymia Insectorum. Appendix 1 (3). — Scaris, 266 pp., 2 pls.
 BURMEISTER, H., 1840. Genus Hypselogenia — Genera quaedam Insectorum, 1 (40), 2 pp., 1 pl.
 —, 1842. Handbuch der Entomologie. 3. Coleoptera Lamellicornia Melitophila. — Berlin, 828 + (1) pp.

- GERSTAECKER, A., 1884. Bestimmung der von Herrn Wr. G. A. Fischer während seiner Reise nach den Massai-Land gesammelten Coleopteren. — Jahresb. wiss. Anst. Hamburg, 1883: 43-63.
- GORY, M., & A. PERCHERON, 1833-1836. Monographie des cétoines et genres voisins. — Paris, 404 pp., 77 pls.
- KRAATZ, G., 1880. Gehört die Goliathiden-Gattung Hypselogenia Burm. zu den Goliathiden? — D. ent. Ztschr., 1880: 168-170, pl. I.
- KRIESCHE, R., 1921. Einige neue Cetonidenformen. — Arch. Naturgesch., 86 A (1920) 122-124. [Publ. February 1921].
- KRIKKEN, J., 1978. Some peculiar cetoniine beetles from South West Africa. — Zool. Meded. Leiden, 53: 153-164, 16 figs.
- MOSER, J., 1921. Neue Cetoniden-Arten (Col.). — Stett. ent. Ztg., 82: 182-189.
- OBERHOLZER, I. I., 1959. A morphological study of some South African Lamellicorn larvae. I, II. — S. Afr. J. agric. Sci., Pretoria, 2: 41-88, 125 figs.
- PÉRINGUEY, L., 1907. Descriptive catalogue of the Coleoptera of South Africa (Lucanidae and Scarabaeidae). — Trans. S. Afr. philos. Soc., 13: 1-752, 6 pls.
- SCHEIN, H., 1960. Coleoptera (Scarabaeidae): Cetoniinae und Trichiinae. — South African Animal Life, 7: 83-112, 11 figs.
- SCHENKLING, S., 1921. Scarabaeidae: Cetoninae. — Col. Catalogus, 72, 431 pp.
- THOMSON, J., 1878. Typi Cetonidarum, suivis de typi Monommidarum et de typi Nilionidarum Musaei Thomsoniani. — Paris, 44 pp.



Figs. 1-6. *Hypselogenia* males. 1, *H. nyassica*, Kidugalla, ca. 20 + 7 (horn) mm; 2, *corrosa*, "Luitpoldkette", 20 + 5 mm; 3, *billbergii*, E. Africa, 23 + 7 mm; 4, *geotrupina* s. str., Salisbury 21.5 + 6 mm; 5, ditto var. *goryi*, Colesberg, 20.5 + 4.5 mm; 6, ditto var. *concava*, Transvaal, 20.5 + 5 mm.