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CATALOGUE OF THE COLEOPTERA CETONIIDAE IN THE LEIDEN MUSEUM

1. Goliathus Lamarck, sensu lato

by

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With six text-figures and two plates

The collection of Cetoniid Coleoptera in the Rijksmuseum van Natuurlijke Historie at Leiden contains, next to the usual assortment of chafers from various sources, several collections made by well-known specialists. Most important is the one made by F. T. Valck Lucassen (including the collection of O. E. Janson), acquired by the museum in 1940. A world collection of Cetoniidae is being arranged on the basis of this Valck Lucassen material. In 1928, the collection of G. van Roon was bequeathed to the museum, where it is to remain as such, not incorporated in the main collection.

The data of the collection will be presented in this and forthcoming parts of a catalogue, accompanied by such revisional notes which it seems desirable to publish. Reference is here made to Junk's Coleopterorum Catalogus (Schenkling, 1921); in general, citations given by Schenkling will not be repeated in this series.

Acknowledgements

Thanks are due to the following persons, who communicated data or gave specimens in loan, from the collections under their care viz., Dr. C. A. W. Jeekel, Zoölogisch Museum, Amsterdam; Messrs. R. D. Pope and M. E. Bacchus, British Museum (Natural History), London; Dr. H. Roer, Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn; Dr. G. Scherer, Museum G. Frey, Tutzing bei München.

Goliathus Lamarck, sensu lato

There is some confusion over the classification of the African Cetoniidae belonging to, or related to *Goliathus* Lamarck, due to extreme splitting and to inadequate knowledge of the correlation of the sexes.

For the eleven species and three subspecies recognized here, there are about ten generic names available, and several times as many specific and varietal names. The proposal by Arrow (1941: 74) to lump all together in one genus *Goliathus* is accepted, although allowance is made for some infrageneric division (see also the suggestions by Kolbe, 1893; 1898: 24-25, 177-178; De Lisle, 1947: 15). Some species groups may actually represent superspecies, in which the members are largely allopatric. As genus group names are available for all, they are here treated as subgenera. A survey would contain the following (see the maps of fig. 2-4, 6):

subgenus *Goliathus* Lamarck, with *G. g. goliatus* (L.) from the Congo-basin, Tanganyika west of Lake Victoria, Uganda and western Kenya, reaching Nigeria in the north-west; *G. goliatus orientalis* Moser, from the savannas of south-eastern Congo, eastwards through Tanganyika as far as the shores of the Indian Ocean; *G. goliatus regius* Klug and *G. cacicus* (Olivier) from Africa west of Cameroun; *G. a. albosignatus* (Boheman) and *G. albosignatus kirkianus* Gray from south-eastern Africa, roughly south and north of the Zambesi River, respectively;

subgenus *Argyrophegges* Kraatz, with *G. kolbei* (Kraatz) from south-eastern Kenya, north-eastern Tanganyika and Zanzibar;

subgenus *Fornasinius* Bertoloni, with *G. fornasini* Bertoloni from Kenya, eastern Congo (Kinshasa), Tanganyika and Mozambique; *G. russus* Kolbe from Congo, Tanganyika west of Lake Victoria, and western Uganda, eastwards into Gabon; *G. aureosparsus* (Van de Poll) from Nigeria and Cameroun; *G. higginsi* Westwood from Ghana;

subgenus *Hegemus* Thomson, with *G. pluto* Raffray from the eastern plateau of Ethiopia; *G. vittatus* (Bates) from Tanganyika; and *G. peregrinus* (Von Harold) from Angola.

The groups are distinguishable mainly on the shape of the male cephalic horn (Kolbe, 1898: 24-25; see also scattered remarks in Arrow, 1951, from whom I borrowed some of the characterizations given below) and in the dentation of the male fore tibiae.

In the species of the subgenus *Goliathus* the males have a forked protuberance upon the head. While *G. albosignatus* may have a small lateral tooth on the male front tibia, the fore shankles of the other species are devoid of teeth. The male genitalia are very similar in all species (fig. 1a; cf.

Sjöstedt, 1927a: 2-3, fig. 1), again with the exception of *G. albosignatus* whose parameres (fig. 1b) are shorter and the lateral parts wider, extending over a greater length, while the lateral grooves are deeper than in the other species.

In the subgenus *Argyrophegges* the cephalic outgrowth (pl. 1 fig. 4) is less prominent, and one of the lateral teeth is distinctly visible on the front tibia in most specimens. The tarsi, especially those of the fore legs, are very long in both sexes, and this distinguishes the female from that of *G. vittatus* (subgenus *Hegemus*) with which it otherwise could quite easily be confused. The parameres (fig. 1c) are short and robust, and the lateral parts, bisinuate in outline, are wider than in any of the other species.

In males of *Fornasinius* the horn stands up freely from the middle of the head and tapers to a terminal fork, although in small forms it may be carried over a great part of its length (fig. 5). The male fore tibiae bear two lateral teeth, the anterior of which is always prominent. The male genitalia are rather similar in the four species; the parameres are shortest and most robust in *G. fornasini* (fig. 1d), more slender in *G. russus* (fig. 1e) and *G. aureosparsus* (fig. 1f), most slender although comparatively not very long in *G. higginsi* (fig. 1g).

The cephalic horn in *Hegemus* is shovel-shaped and relatively short, as in very small specimens of *G. fornasini*. The male front tibiae have two distinct lateral teeth, as in the female. The parameres (fig. 1 h-j) are rather robust, those of *G. vittatus* (fig. 1 i) and *G. peregrinus* (fig. 1 j) more so than in the other species.

Some colour-characters by which the species can easily be distinguished, are mentioned under the headings of the subgenera, below.

Goliathus Lamarck

Goliathus Lamarck, 1801, Syst. anim. sans vert.: 209 (type species, *Scarabaeus goliatus* Linnaeus, 1771).

Goliath Latreille, 1807, Gen. Crust. Ins., 2: 126 (emendation of *Goliathus* Lamarck, 1801).

Hegemon Harris, 1839, J. Essex nat. Hist. Soc., 1: 101 (replacement name for *Goliathus* Lamarck, 1801).

A recent revision, with a key to the species, was given by Endrödi (1951; 1960, key: 472-473). He recognized four species, and presented tables for the identification of many infrasubspecific taxa which, however, for the greater part appear to represent insignificant individual aberrations or variants. Fortunately, none of Endrödi's new names are available under the provisions of the International Code of Zoological Nomenclature (art. 45),

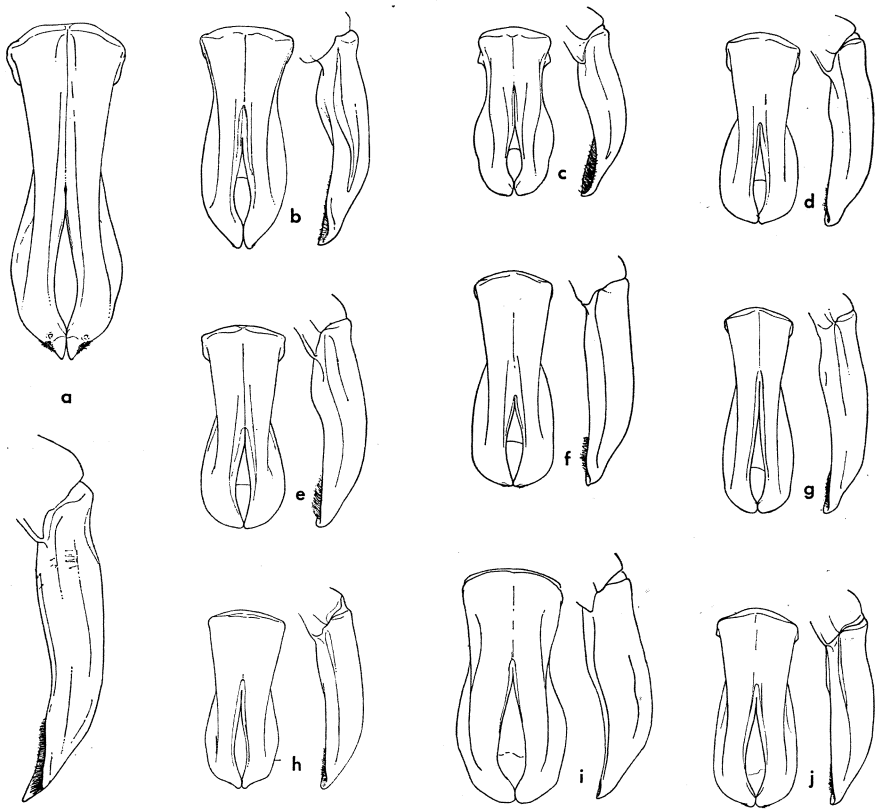

Fig. 1. Shape of the parameres of the male genitalia in *Goliathus*. a, *G. goliatus regius* Klug ("Guinea"); b, *G. a. albosignatus* (Boheman) (Magalies Mts., Transvaal); c, *G. kolbei* (Kraatz) (patria?); d, *G. fornasini* Bertoloni (I. Kérévé, Tanganyika); e, *G. russus* Kolbe (Bangassou, Congo-Brazzaville); f, *G. aureosparsus* (Van de Poll) (Cameroun); g, *G. higginsi* Westwood (Dimbokro, Ivory Coast); h, *G. pluto* Raffray (Bogos, Ethiopia); i, *G. vittatus* (Bates) (Vy. Ruaha River, Tanganyika); j, *G. peregrinus* (Von Harold) (Caconda-Benguela, Angola).

and the names are not considered in the present catalogue. Some of the older names given to varieties are available (art. 45e), and short references to those not mentioned by Schenkling (1921) are listed under the species.

Goliathus (G.) goliatus (L.)

G. goliatus is here treated as a polytypic species with three subspecies viz. *G. g. goliatus, G. g. regius* and *G. g. orientalis* (see fig. 2).

In the Coleopterorum Catalogus *G. atlas* Nickerl was listed as a separate

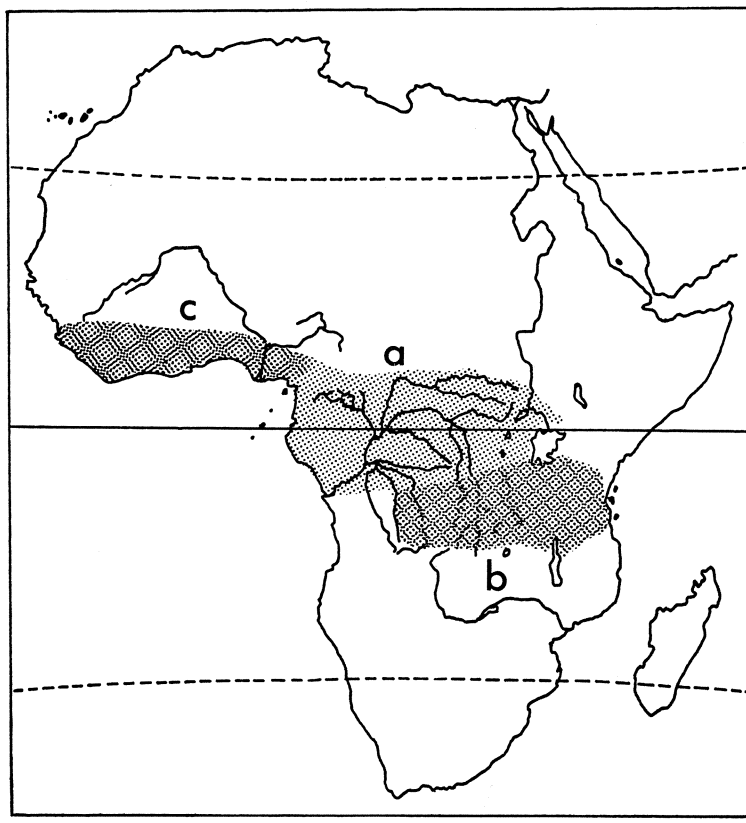

Fig. 2. Distribution of *Goliathus goliatus* (L.). a, *G. g. goliatus* (L.); b, *G. g. orientalis* Moser; c, *G. g. regius* Klug.

species, but I agree with Endrödi (1960: 470) that it should be considered an insignificant variation of *G. regius*.

G. goliatus and *G. regius* are very close in both structure and colour characters. It is impossible always to exactly differentiate between the two. Endrödi (1960: 472) stated: "Es ist fast wahrscheinlich, dass diese beiden Formen nur geografische Rassen einer und der selben Art darstellen". I also refer to Kraatz (e.g., 1897: 249-252; 1898: 11-12), Sjöstedt (1927a: 2-3), and again Endrödi (1960: 470), to mention only a few authors who tentatively assigned *G. atlas* to *G. goliatus*, to *G. regius*, or even to *G. cacicus*, or considered the possibility that *G. goliatus* and *G. regius* are conspecific; but see De Lisle (1947: 12-13) for some arguments to the contrary. *G. cacicus*, I agree with Endrödi (1960: 471), is always clearly distinguishable from the other forms.

Apart from some specimens of the *atlas*-form, there are in the present collection two female specimens from Ashanti (Ghana) that somewhat deviate from the local *regius*-facies and are more like some aberrations described in *G. goliatus* (viz. Endrödi's Hauptgruppen vi and vii, quite similar to the aberrations described by Sjöstedt, 1927a: 22, pl. 5 fig. 1-2 as *albovariegatus,* from Nigeria). One *G. goliatus* recorded from Ghana in Endrödi's map (1951: 47) I could not trace, nor could I find a more specified record of the one *G. regius* from southern Cameroun indicated on the same map.

In the Cameroons, *G. goliatus* tends to a more whitish design of the elytra (cf. Basilewsky, 1956: 30, "..... Cameroun, où les exemplaires presque entièrement blancs semblent plus nombreux qu'ailleurs"), and many of the varieties of *G. goliatus* and of *G. regius* were described from this region. Of some, the identification with either *G. goliatus* or *G. regius* is quite arbitrary.

All these data are highly suggestive of the conspecificity of *G. goliatus* and *G. regius*. It is a moot point whether the forms should be considered allospecies (sensu Amadon, 1966), or subspecies as is done in the present paper; or whether *G. regius* is merely a colour phase which has become more or less restricted to a definite region

The specimens from south-eastern Congo (Kinshasa), Nyasaland and Tanganyika form another geographical colour-variant, *G. g. orientalis*. Here again, there are some specimens that defy exact differentiation, but in general this subspecies appears to be well defined (Basilewsky, 1956).

The subspecies may be recognized as follows:

1. Elytra dark, or with a black stripe along the median suture over its whole length 2
— Elytra white along the median suture, at least in the posterior half; the discs white, with a characteristic black lateral band, in typical examples extending from basis to apex . . . . . *G. g. regius*
2. Elytra reddish black in typical examples, this colour sometimes reduced and mixed with white to the extreme of blackish humeral and apical dots on a white background *G. g. goliatus*
— Elytral pattern consisting of subcircular, or more angular, white dots on a blackish background . . . . . *G. g. orientalis*

Goliathus (G.) goliatus regius Klug

(fig. 1a, 2c)

Goliathus regius Klug, 1835, Erman's Reise: 36, pl 15 fig. 7 (type loc., Sierra Leone).
Goliathus atlas Nickerl, 1887, Stettin. ent. Ztg., 48: 174 (type loc., along river Volta).
Further names, made available in *Goliathus* by Burgeon, 1928, are: *hieroglyphicus* Sjöstedt, 1927; *striatus* Sjöstedt, 1927; *undulus* Sjöstedt, 1927 (all from Nigeria).

Material. — Sierra Leone (Raye), 1 ♂. Ivory Coast, 1 ♂. Ghana, 1 ♂; do. (A. A. van Bemmel), 1 ♂; do. (Van den Bossche), 1 ♂; do. (A. Kricheldorff),

1 ♂; Ashanti (Junod), 20 ♂, 22 ♀; Elmina (Pel), 2 ♂, 2 ♀; near Accra (Macdonald, 1895), 1 ♂, 1 ♀. Cameroun: Bamun, 1 ♂, 1 ♀; 1 ♂ ("Kamerun"). "Guinea", 2 ♂, 2 ♀; do. (Swanzey), 1 ♂, 1 ♀; do., 1 ♀ (coll. Van Roon). "W. Africa", 2 ♂; do. (Higlett), 1 ♂. Patria?, 1 ♂; 1 ♂ (coll. Van Roon).

One of the specimens in the British Museum (Natural History), from the Begoro-district (Ghana), bears an indication that it was collected at an altitude of 900 feet.

See Endrödi (1960: 484-491) for variation and distribution.

Goliathus (G.) g. goliatus (Linnaeus)
(fig. 2a, pl. 1 fig. 1)

Scarabaeus goliatus Linnaeus, 1771, Mant. plant. (altera): 530 (type loc., river Gabon, opp. Prince's isl., on the equinoctial line).

The usual reference to Drury as the author of the specific name appears to be incorrect, cf. Harris (1839). Both Linnaeus (1771) and Drury (1773) wrote *goliatus,* and not *goliathus* as the name is now usually written.

Goliathus giganteus var. *grandis* Veen (from Upper Sangha River, Congo-Brazzaville), the original description of which remained unknown to Schenkling (1921) and Endrödi, was published and figured in the "Oprechte Haarlemsche Courant" of Sunday, November 29, 1903, Bijvoegsel Stads-Editie no. 48: 558-559. The type specimen, which should be in the Koninklijk Museum voor de Tropen, or in the Zoölogisch Museum, both in Amsterdam, appears to be lost.

Material. — Nigeria: Barombi, 5 ♂, 1 ♀; "Jsongo" (S. G. Feldmann, 1912), 2 ♂, 1 ♀. "Cameroons", 15 ♂, 9 ♀; do. (Th. Bicker Caarten), 2 ♀; do. (D. A. Rutherford), 1 ♀. Cameroun: Douala (A. Kricheldorff), 2 ♂, 1 ♀; Yaoundé, 1 ♂, 2 ♀; Bipindihof, Kribi (Zenker, ii-1925), 2 ♂, 2 ♀; Kribi, 1 ♂; do., 17 ♂, 11 ♀ (coll. Van Roon); do. (Zenker, 1925), 3 ♂, 1 ♀; Sangmelima, 3 ♂, 3 ♀. Congo (Brazzaville): 1 ♂; Kuilo-river (de la Fontaine Verwey), 2 ♂; Niari (Tabacco, vi.1923), 1 ♂. Congo (Kinshasa): 2 ♂, 2 ♀; Upper Congo, 1 ♂; Buta, distr. Bas Uele (iv.1915), 2 ♂; Bafwabaka (L. Jeukens), 1 ♂; Bafwasio, Panga terr. (Durand, (15).vii.1925), 2 ♀; Stanleyville, 1 ♂, 1 ♀; Irangi (J. J. Laarman), 8 ♂, 4 ♀; Lower Congo river, 1 ♂, 2 ♀; Banana (1902), 1 ♂; Matadi, 3 ♂; Stanley Pool, 1 ♂; Kikwit, Kwango (Tabacco, (v.).1925), 3 ♂, 8 ♀; Luebo, 1 ♀; Lulua, Kasai, 1 ♂, 1 ♀; Kasai river (H. C. Kooiman, 21.viii.1896), 2 ♂, 1 ♀; Kasai (Tabacco, 1923), 1 ♂, 1 ♀; Sankuri, Kasai, 1 ♂ (coll. Van Roon); Central Congo, 1 ♂. "Tschangopo, Wiadi" (25.v.1922), 1 ♂. Tanganyika: Girya, Mabira Forest (E. Brown, 1909), 1 gynandromorphous specimen, 1 ♂, 1 ♀; do. (Gowdry), 1 ♀. Patria?, 34 ♂, 22 ♀.

There are quite a few records of *G. g. goliatus* in faunal lists and popular reviews. Gedye (1928: 60) recorded the species from western Kenya as far as Rift Valley; I saw a specimen from Kakamega (Kenya) in the British Museum (Natural History). See also Endrödi (1951; 1960: 573-484).

Several authors recorded the form from *Vernonia* (Compositae), e.g.

Kolbe (1914: 374), Sjöstedt (1927: 23), Mayné (1925: 54), Burgeon (1932: 69). De Lisle (1945: 79) gave more precise information: the imago lives exclusively on *Vernonia conferta* Benth. in Cameroun; it seems to take little nourishment, but only to nibble some pollen. The larvae were found by De Lisle in the truncs of *Albizzia* spp. (Mimosaceae), *Uapaca guineensis* Muell. (Euphorbiaceae), *Terminalia superba* Engl. et Diels (Combretaceae) and *Pycnanthus kombo* Warb. (Myristicaceae). Kolbe (1892: 240) mentioned the species from the Cameroons "an Blättern von Palmen".

De Lisle (1944: 64) found *G. goliatus* throughout the year in the imaginal stage. A survey of the life-history was given by Basilewsky (1956: 28-29), who recorded a larval life of 4 to 6 months (three moults), a nymphal stage of 30 to 60 days, and an adult life of 4 to 5 months. According to Basilewsky (p. 31) the race is not found at altitudes higher than 1,000 m, but Mr. P. J. H. van Bree, of the Amsterdam museum, collected the species at Belinga (near Mvahdi, Gabon) at 1,600 m altitude (1968, pers. comm.).

A gynandromorphous specimen from Mabira Forest, Tanganyika, was mentioned by Janson (1910: xxxvi) and Valck Lucassen (1931: lxxxi-lxxxii); it is figured on pl. 1 fig. 1.

Goliathus (G.) goliatus orientalis Moser

(fig. 2b)

Goliathus giganteus orientalis Moser, 1909, Deutsche ent. Zeitschr., 1909: 238, fig. (type loc., env. Lindi, Tanganyika).

Goliathus meleagris Sjöstedt, 1927, Ent. Tidskr., 48: 127 (type loc., Katinda, Katanga merid., Congo-Kinshasa; cf. Sjöstedt, 1927a: 9).

Goliathus goliathus usambarensis Preiss, 1933, Verh. naturhist. Ver. preuss. Rheinl. u. Westfalens, 90: 89, pl. 1 fig. 3 (type loc., Usambara, Tanganyika).

Material. — Congo (Kinshasa): Katinda (Kinda), Katanga, 7 ♂ (1 ♂, cotype of *G. meleagris* Sjöstedt), 2 ♀; M'Pala region (R. P. Guillemé), 2 ♂, 1 ♀.

Basilewsky (1956: 31) noted that this subspecies "bien que spéciale aux pays de savane, (—) n'est nullement xérophile mais exige pour son développement larvaire un milieu ombragé et un peu humide (—). On ne la rencontre donc pas dans les régions trop sèches et trop peu arborées, ni à les altitudes supérieures à 1200-1400 m".

Judging from the locality, the *Goliathus* n. sp. from Tanganyika listed by Kolbe (1898: 177), belongs to the present subspecies.

Goliathus (G.) cacicus (Olivier)

(fig. 3d)

Cetonia cacicus Olivier, 1789, Ent., 1, no. 6: 8, pl. 4 fig. 22 ("elle se trouve dans l'Amérique méridionale" [error]).

Voet (1769, or 1766) described this insect in the first part of his "Catalogus systematicus Coleopterorum", of which I only saw a Bakhuysen-edition dated 1806 (see Hagen, 1875: 405-408 for bibliographical details). He placed it in "Genus primum. Scarabaeus" ("Premier genre. Scarabés", "Eerste geslacht. kevers") and listed the species as no. 151 "Cacicus ingens" ("le grand Cacique"; "de groote Cacike") (p. 34, 36-37, and 35, of the latin, french, and dutch versions, respectively); it is illustrated on his plate 22 (no. 151). While this appears to be the first description of the species now known as *Goliathus cacicus,* Voet cannot be maintained as its author, because his work does not satisfy the conditions of art. 11c of the International Code of Zoological Nomenclature. Instead, Olivier (1789) should be cited as the author of the specific name.

Material. — Liberia: Cap Palmas, 3 ♂, 2 ♀. Ivory Coast (A. Kricheldorff), 1 ♂, 1 ♀. Ghana: 1 ♂, 1 ♀; do. (A. A. van Bemmel), 2 ♂, 1 ♀; do. (Van den Bossche), 1 ♀; do. (Nagtglas), 1 ♂, 1 ♀; do. (Pel & Nagtglas), 5 ♂, 3 ♀; do. (Swanzey), 1 ♂; Ashanti (Junod), 8 ♂, 3 ♀; Kumasi, Ashanti, 1 ♀; Elmina (Pel), 1 ♂, 2 ♀; near Accra (Macdonald), 1 ♀. "Guinea", 5 ♂, 3 ♀; do. (Nagtglas), 1 ♀. "Cameroons", 1 ♂. "W. Africa", 3 ♂, 1 ♀. Patria?, 3 ♂, 3 ♀; 1 ♂, 1 ♀ (coll. Van Roon).

Savage (1842: 496) recorded that the species feeds exclusively on an unnamed tree belonging to the Compositae (Corymbiferae), which I did not find specified in any of the later records.

The distributional area extends from Sierra Leone, from where I saw a male in the Zoölogisch Museum, Amsterdam, along the Guinean coast to Nigeria (Barombi, Sjöstedt, 1927a: 26, as the easternmost locality); see also Endrödi (1960: 491-499).

Goliathus (G.) albosignatus (Boheman)

The material can be divided into two groups viz. specimens with a dark fringe of hairs on the mid and hind tibiae, and specimens with a yellowish fringe on the four posterior tibiae. The group with dark pubescence represents *G. a. albosignatus,* the other belongs to *G. a. kirkianus.* The boundary between the areas of the two will probably be found not far south of the Zambesi River, although Péringuey (1907: 337) recorded *G. albosignatus* "var. *Kirki*" from Mazoe (near Salisbury, Southern Rhodesia). See Endrödi (1960: 499-503) for additional data on distribution.

Goliathus (G.) a. albosignatus (Boheman)

(fig. 1b, 3e)

Goliath albosignatus Boheman, 1857, Ins. Caffr., 2: 10 (type loc., env. Limpopo River).

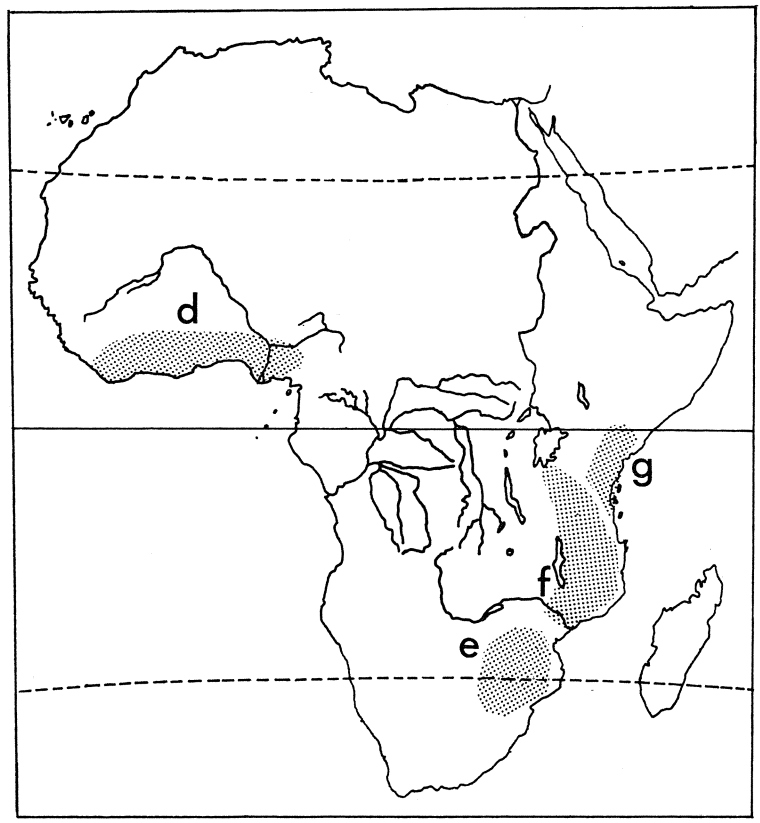

Fig. 3. Distribution of *Goliathus*. d, *G. cacicus* (Olivier); e, *G. a. albosignatus* (Boheman); f, *G. albosignatus kirkianus* Gray; g, *G. kolbei* (Kraatz).

Material. — S. Rhodesia: Chilimanzi Reserve (i. 1918), 2 ♂, 1 ♀. Transvaal: 2 ♂, 1 ♀; Magalies Mts., 2 ♂, 1 ♀.

According to Distant (1897: 575) *G. albosignatus* abounds on *Zizyphus* (Rhamnaceae) in the Transvaal; according to G. A. K. Marshall (in Péringuey, 1907: 337) the species feeds only from the gum exuding from certain species of *Acacia* (Mimosaceae).

Goliathus (G.) albosignatus kirkianus Gray

(fig. 3f)

Goliathus kirkianus Gray, 1864, Ann. Mag. nat. Hist., (3) 14: 311 (type loc., Kebrabassa Hills, Mozambique, 40 miles beyond the town of Tete on the Zambesi River).
Goliathus kirkianus conradsi Preiss, 1933, Verh. naturh. Ver. preuss. Rheinl. u. Westfalens, 90: 88, pl. 1 fig. 1 (type loc., Ukerewe, Lake Victoria, Tanganyika).

Material. — "Congo", 1 ♂. Tanganyika: Itumba, 1 ♂, 1 ♀; Kilimatinde, 1 ♂, 1 ♀; Usagara, 1 ♂, 1 ♀; Lindi, 1 ♂; Kwiro (Miss.-Mus. Steyl), 2 ♂ (coll. Van Roon);

do. (V. Fischer, 1911), 1 ♂. Nyasaland: Lake Nyasa, 1 ♀; vicinity of Lake Nyasa, 1 ♂; Nyasa (Cotteril), 1 ♂, 1 ♀; near Blantyre, 1 ♂. "Zambese?, E. Africa", 1 ♂; "Limpopo, Zambese", 1 ♂. Patria?, 1 ♂.

The male from Usagara represents an extremely light form, with the markings of the elytra as in Endrödi's group iii, the pronotum as in his group 6 (Endrödi, 1960: 500-501).

In the British Museum (Natural History) there is one male from Uganda (holotype of ab. *olivieri* Endrödi, 1960: 503), which is the northernmost record of the species. One specimen in the same collection, from Mt. Mlanje, Nyasaland, was collected at 4,000 feet altitude.

In the Museum G. Frey there is a male from "Kamerun (ex col. Haberecker)" (Dr. G. Scherer, 1967, in litt.), which was recorded by Endrödi (1960: 503, ab. *thomsoni*). Endrödi also mentioned a male of his ab. *bohemani* from "Cameroun" (Mus. Nat. Hist. nat., Paris). These localities are almost certainly wrong.

Argyrophegges Kraatz

Argyrophegges Kraatz, 1895, Deutsche ent. Zeitschr., 1895: 441 (type species, *Argyrophegges kolbei* Kraatz, 1895).

Goliathus (Argyrophegges) kolbei (Kraatz)

(fig. 1c, 3g, pl. 1 fig. 4, 5)

Argyrophegges kolbei Kraatz, 1895, Deutsche ent. Zeitschr., 1895: 441 (type loc., Tewe, N. Usambara).

Material. — Kenya: Kikuyu (Itzinger), 1 ♂. Tanganyika: Lutindi, W. Usambara, 4 ♂; do. (vi. 1921), 1 ♂; do., 6 ♂, 1 ♀ (coll. Van Roon); Tanga, N. Usambara, 1 ♂; Ngtelo, Usambara, 5 ♂, 4 ♀; Usambara, 2 ♂, 3 ♀; do., 1 ♂ (coll. Van Roon). Zanzibar: 1 ♀. Patria?, 1 ♂.

Tewe and Pangwe near Tanga (Hintz, 1896: 359), both in Usambara (north-eastern Tanganyika), appear to be the only localities recorded for this species. The present material enlarges the known distribution to a considerable extent.

Fornasinius Bertoloni

Fornasinius Bertoloni, 1853, Mem. Accad. Sci. Ist. Bologna, 4: 348 (type species, *Goliathus fornasini* Bertoloni, 1853).

Goliathinus Westwood 1874, Thes. Oxon.: 2 (type species, *Goliathus fornassinii* [!] Bertoloni, 1853).

Goliathinus Thomson, 1880, Bull. Soc. ent. France, 1880: cvii (type species, *Goliathus higginsi* Westwood, 1874).

Sphyrorrhina Nickerl, 1890, Stettin. ent. Ztg., 51: 14 (type species, *Sphyrorrhina charon* Nickerl, 1890 = *Goliathus higginsi* Westwood, 1874).

Golianthus Heath, 1900, Ann. Mag. nat. Hist., (7) 5: 397 (erroneous spelling of

Goliathus Lamarck, 1801; only included species, *Golianthus (Sphyrorrhina) wisei* Heath, 1900 = *Goliathus fornasini* Bertoloni, 1853).

Golianthinus Heath, 1900, Ann. Mag. nat. Hist., (7) 5: 546 (erroneous spelling of *Goliathinus* Westwood, 1874; only included species, *Golianthinus (Sphyrorrhina) wisei* Heath = *Goliathus fornasini* Bertoloni, 1853).

Mycteroplus Fairmaire, 1903, Bull. Soc. ent. France, 1903: 150 (type species, *Mycteroplus proboscideus* Fairmaire, 1903 = *Goliathus aureosparsus* (Van de Poll, 1890)).

Myctoplerus Fairmaire, 1903, Bull. Soc. ent. France, 1903: 202 (replacement name for *Mycteroplus* Fairmaire, 1903, not Herrich-Schäffer, 1849).

The species here united in subgenus *Fornasinius* seem to form a superspecies. One, viz. *G. russus,* differs more from the other three, than *G. fornasini, G. aureosparsus* and *G. higginsi* differ from one another; it may represent a semispecies, wedging in between the allospecies *G. fornasini* and *G. aureosparsus.* The close similarity of the East-African and West-African forms is suggestive of a connection to have existed that is now lost. There are more examples of this phenomenon in other groups of African Cetoniidae. I prefer to postpone a possible explanation of this geographical pattern until these other groups have been treated in this catalogue.

The four species may be distinguished as follows:

1. General colour reddish, tending to black in rare exceptions . . . . *G. russus*
— General colour black or brown, often with yellowish stripes and dots . . . 2
2. Pubescence of hind and mid tibiae, and that of the abdominal segments and pygidium, yellowish brown 3
— Pubescence of the posterior four tibiae black, as is the pubescence of the abdomen *G. fornasini*
3. Elytra unicolorous, dark brown . . . . . *G. higginsi*
— Elytra velvet-brown, with yellow-golden dots . . . . . *G. aureosparsus*

Goliathus (Fornasinius) fornasini Bertoloni

(fig. 1d, 4h, 5, pl. 2 fig. 8)

Goliathus fornasini Bertoloni, 1853, Mem. Accad. Sci. Ist. Bologna, 4: 345, pl. 1 (type loc., border of Magnárra River, Mozambique).

Goliathus (Fornasinius) insignis ab. *funereus* Burgeon, 1937, Expl. Parc nat. Albert, Mission de Witte (1933-1935), 7 : 7 (type loc., Katande, northern Rutshuru, Congo-Kinshasa).

Material. — Kenya: Jkutha (J. Hofmann, iv. 1908), 1 ♂, 1 ♀; Kibwezi (R. A. Dummer), 1 ♂. Vict. Njansa (Itzinger), 1 ♀. Tanganyika: I. Ukerewe, 9 ♂, 9 ♀; do. (Conrads, 1913), 3 ♂, 3 ♀; do. (Miss.-Mus. Steyl), 1 ♀ (coll. Van Roon); "I. Kérévé", 1 ♂; Usambara, 1 ♀; Usagara, 1 ♀; Katona, Shirati (v. 1909), 1 ♀; "D.O. Africa" (Miss.-Mus. Steyl), 1 ♀ (coll. Van Roon). Patria?, 1 ♀.

Goliathus fornasini appears to be widely distributed in eastern Africa: southernmost are the records from Mozambique (Bertoloni, 1853; Zambesi, Westwood, 1874: 3; Dohrn, 1876: 66); northernmost, south of Lake Rudolf

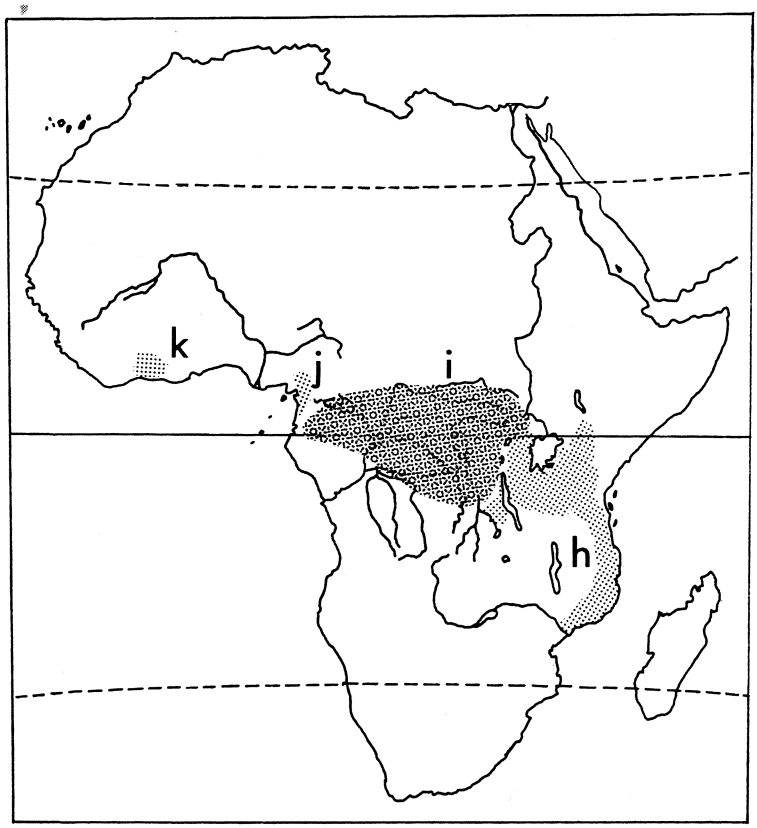

Fig. 4. Distribution of *Goliathus,* subgenus *Fornasinius.* h, *G. fornasini* Bertoloni; i, *G. russus* Kolbe; j, *G. aureosparsus* (Van de Poll); k, *G. higginsi* Westwood.

in Kenya (Künckel, 1909: 70); easternmost, Congo-Kinshasa (Baudouinville, Burgeon, 1932: 70; Katande, National Albert Park, Burgeon, 1937: 7; and Lufira River, Katanga (see below)); westernmost, Usambara, Tanganyika (Kolbe, 1913: 210).

The specimens here recorded from Jkutha (Ikutha, Kenya) are labelled "cotype *F. hauseri* Kraatz", but I doubt whether they did belong to Kraatz's type series. Except for the original description (Kraatz, 1896: 67; Cameroons) most records of *F. hauseri,* which seems to represent merely a variant of *F. fornasini* (and was treated as such by Kolbe, 1913: 210; 1914: 376), are from Kilimanjaro and surroundings (Kraatz, 1900: 220; Kolbe, 1913: 210; 1914: 376); it is also known from Kibwezi (Kenya) and (Kolbe, 1914: 376): "findet sich vielleicht auch am Victoria-Nyansa". Until other finds

confirm its presence in western Africa, I presume the locality record of *F. hauseri* from the Cameroons to be incorrect. See also De Lisle (1945: 80; 1947: 14), who recorded a female of *G. fornasini* from Nigeria, and a male from Lolodorf (Cameroun), but doubted the correctness of the labels. Moreover, in all cases the possibility of confusion with *G. aureosparsus* should be considered.

The forms described by Kolbe (1913: 209-210; 1914: 374-376) seem to be individual variants, and several may be found together in one restricted area (Ukerewe Isl.; fig. 5).

Some of the localities are situated in low land areas, others are probably more montane. Of only one the altitude was recorded viz. Katande, 950 m (Burgeon, 1937: 7); one specimen, from Lufira River, Katanga (in the British Museum, Natural History), was collected at 3,500 feet altitude. One specimen from Tanganyika, in the British Museum (Natural History), bears an indication that it was collected on acacia; Bertoloni described the species from palm-groves in Mozambique. Although its distribution is over an area most of which is now open savanna, the species may well be restricted to gallery forest.

Goliathus (Fornasinius) aureosparsus (Van de Poll)

(fig. 1f, 4j, pl. 1 fig. 2, 3)

Goliathinus aureosparsus Van de Poll, 1890, Notes Leyden Mus., 12: 131 (type loc., Barombi, Nigeria).

Mycteroplus proboscideus Fairmaire, 1903, Bull. Soc. ent. Franc, 1903: 150 (type loc., Cameroons).

Material. — Nigeria: Barombi (Preuss), 1 ♀ (holotype, *Goliathinus aureosparsus* Van de Poll). "Kamerun", 1 ♂.

The present male was compared by Valck Lucassen with specimens of *Myctoplerus proboscideus* (Fairmaire) in the Berlin Museum, and found to be identical. It seems probable that *Myctoplerus proboscideus* is a synonym of *G. aureosparsus* (Van de Poll), rather than of *G. fornasini* Bertoloni as suggested by Arrow (1941: 76).

Kolbe (1892: 240) published a note on the flight of this species. According to De Lisle (1945: 80, evidently the same as 1944: 64, sub *Fornasinius insignis*) *G. aureosparsus* is found on *Musanga smithii* R. Br. (Malvaceae), but feeds also on several species of *Vernonia*. He recorded the species from Barombi (Nigeria), Batouri, Eseka, Ebelowa, and Lolodorf (all Cameroun; sub *M. proboscideus*), and also Ambam (Cameroun; cf. De Lisle, 1947: 15). De Lisle (1947: 15) described some variation of the species, notably in the shape of the male cephalic horn, equivalent with most of the varieties described in *G. fornasini*. He recognized *Goliathus guirali* Künckel (1887:

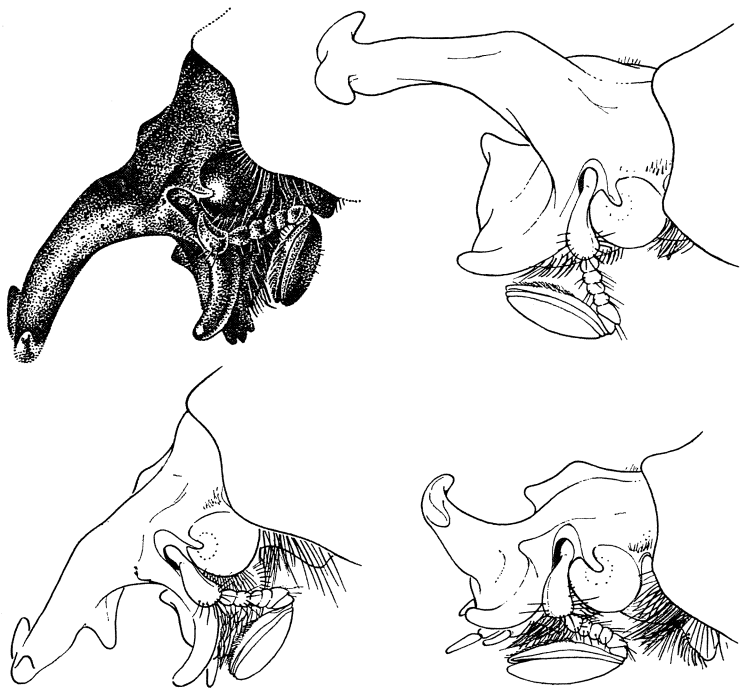

Fig. 5. Variation in the male head of *G. fornasini* Bertoloni; all specimens from Ukerewe I., Lake Victoria.

cxxxv, MS-name) as *G. aureosparsus,* and thus confirmed Van de Poll's suspicion (1890: 134) mentioned in his description of *G. aureosparsus.*

Goliathus (Fornasinius) higginsi Westwood
(fig. 1g, 4k, pl. 2 fig. 7)

Goliathus higginii Westwood, 1874, Thes. Oxon.: 2, pl. 2 fig. 7 (type loc., "Africa tropicalis"; errata, p. 203: *higginsi* instead of *higginii*).

Sphyrorrhina charon Nickerl, 1890, Stettin. ent. Ztg., 51: 13, pl. with 3 fig. (type loc., "vermutlich aus Guinea").

Material. — Ivory Coast: Dimbokro, 1 ♂. "?Guinea, coll. v.d. Poll", 1 ♀.

The male here recorded was bought of E. le Moult by O. E. Janson, who was evidently much upset when he found the specimen not perfect. A label attached by Janson reads: "(—) cost £ 3. Tarsi appear false and to have been made up from those of other species!! A fraud!!". Notwithstanding the false tarsi, the specimen appears to be recognizable as *Sphyrorrhina charon* Nickerl, which is, in my opinion, the male of *Goliathus higginsi* Westwood.

Kolbe (1893: 206) hinted at the conspecificity of *G. higginsi* and *Sphycorrhina* [!] *charon*; Born (1891: 163) recorded Ashanti (Ghana) as a locality for the latter. There is one specimen from southern Nigeria in the Museum G. Frey (Dr. G. Scherer, 1967, in litt.) .

The specimen recorded by Westwood (1890: 397, pl. 11 fig. 4) from Accra (Ghana) most probably does not belong to *G. fornasini* Bertoloni, but seems to be the male of his *Goliathinus higginsi* depicted on the same plate, fig. 3.

Goliathus (Fornasinius) russus Kolbe

(fig. 1e, 4i, pl. 2 fig. 9)

Goliathus russus Kolbe, 1884, Berlin. ent. Zeitschr., 28: 386, fig. 1, 3 (type loc., Mukenge, on Congo River; Congo-Kinshasa).

Material. — Congo (Brazzaville): Bangassou, Sud Oubanghi (x. 1924), 1 ♂. Congo (Kinshasa): Upper Congo, near Stanley Falls, 1 ♂. Tanganyika: Girya, Mabira Forest (E. Brown, 1909), 2 ♂, 2 ♀; Mulange, Mabira Forest, 4,000 ft. (6.x.1922), 1 ♂, 1 ♀.

Goliathus russus is known from several localities in Congo (see Burgeon, 1924: 114; 1932: 70; Schouteden, 1932: 104; Burgeon, 1936: 10, "rare, bien que largement répandu") and from Uganda (Schenkling, 1907: 416; Kolbe, 1914: 376). Recently, Ruter (1967: 1300) mentioned Gabon as within the distributional area, and recorded an entirely black female specimen from Sibiti (Congo-Brazzaville). In the British Museum (Natural History) I saw a specimen from D'Ja Posten (Cameroun), which seems to be the westernmost locality for the species, and two specimens from Uganda. Dr. G. Scherer (1967, in litt.) wrote to me that there are three specimens in the Museum G. Frey, one of which is from Kampala, Uganda, the easternmost locality. The type locality Mukenge, just south of Luluabourg (Congo-Kinshasa), seems to be the southernmost locality, the northernmost known to me is Bangassou (Congo-Brazzaville). One specimen, from Mabira forest, Tanganyika, was collected at an altitude of 4,000 ft.

Hegemus Thomson

Hegemus Thomson, 1881, Bull. Soc. ent. France, 1881: xi (type species, *Goliathus pluto* Raffray, 1881).

The species may be distinguished as follows:

1. Dorsal pattern consisting of small yellow dots on a brown or black background 2
— Dorsal pattern consisting of longitudinal silvery stripes on a black background . . . . . *G. vittatus*
2. Colour of background black . . . . . *G. pluto*
— Colour of background brown . . . . . *G. peregrinus*

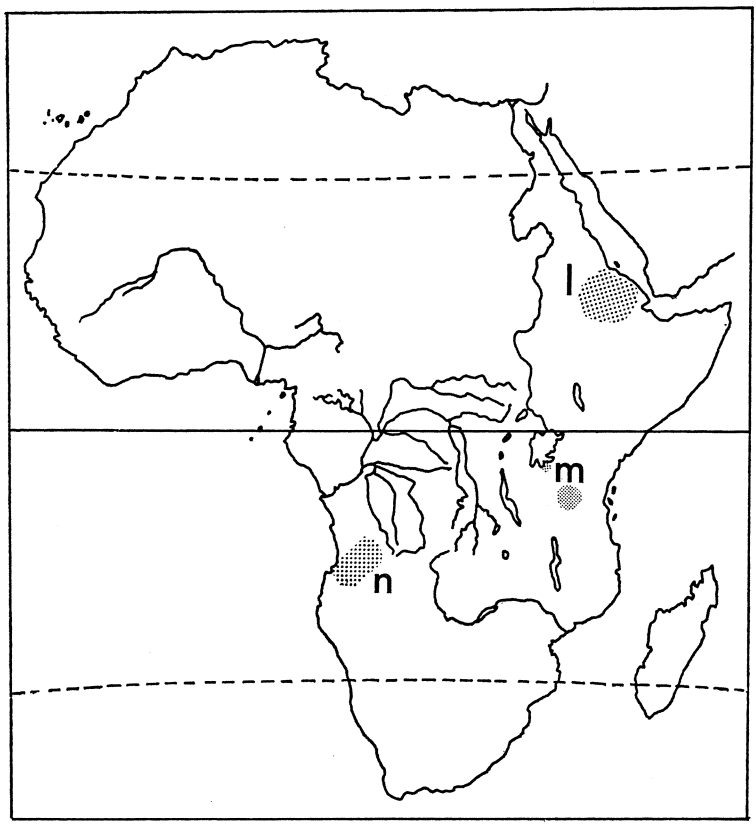

Fig. 6. Distribution of *Goliathus*, subgenus *Hegemus*. l, *G. pluto* Raffray; m, *G. vittatus* (Bates); n, *G. peregrinus* (Von Harold).

Goliathus (Hegemus) pluto Raffray

(fig. 1h, 6l, pl. 2 fig. 1, 4)

Goliathus (*Goliathinus*) *pluto* Raffray, 1881, Bull. soc. ent. France, 1880: cxxiii (type loc., Bogos, Ethiopia; extensive description, 1881, Ann. Soc. ent. France, 1881: 241-242, pl. 5 fig. 4).

Material. — Ethiopia : Bogos, 2 ♂, 1 ♀; do. (Raffray, voy. 1881), 1 ♀.

The larger of the males, from the Janson collection ex coll. Van de Poll, is selected lectotype. The dorsal design is not quite the same as that of Raffray's figure, but it seems probable that it formed part of the type series. It is figured on pl. 2 fig. 1.

There are several specimens of this species in the Museum G. Frey, all from Ethiopia (Dr. G. Scherer, 1967, in litt.), and two in the British Museum

(Natural History) among which one from the "eastern slopes, Fil Fil" (Ethiopia).

Raffray (1885: 323) noted the altitude of several specimens taken, viz. 1,400 and 1,600 m.

Goliathus (Hegemus) vittatus (Bates)

(fig. 1i, 6m, pl. 2 fig. 2, 5)

Fornasinius vittatus Bates, 1888, Ent. monthly Mag., 24: 241 (type loc., Ugogo, Tanganyika).

This species is not represented in the collections of the Leiden Museum. I have seen two females and one male in the British Museum (Natural History) from Tanganyika (Msagaa, 35 m E. of Singida, and Vy. Ruaha R.), while Dr. G. Scherer (1967, in litt.) informed me that there are two specimens from Tanganyika in the Museum G. Frey. It was recorded by Kolbe (1914: 377) from Mwanza, Tanganyika.

As seen from fig. 6 m, the distribution is disjunct merely, it would seem, because of the extreme scarcity of the beetle, virtually nothing of which is known except its existence.

Goliathus (Hegemus) peregrinus (Von Harold)

(fig. 1j, 6n, pl. 2 fig. 3, 6)

Fornasinius peregrinus Von Harold, 1878, Mitt. München. Ent. Ver., 2: 102 (type loc., "im inneren Guinea" Angola (?Pungo Adongo), see Von Harold, 1879: 55).

Material. — Angola: Pungo Adongo (Pogge, 1881), 1 ♀; Caconda, Benguela, 1 ♂.

Next to the uncertain locality mentioned by Von Harold, Kolbe (1884: 94) recorded the species from Malange ("im inneren Angola"). Dr. G. Scherer (1967, in litt.) communicated two localities of specimens in the Museum G. Frey, viz. Quécaconda, and Caconda, both in Angola.

Approximate location of places mentioned in this paper

Accra (Ghana, 5.33N 0.15W); Ambam (Cameroun, 2.23N 11.17E); Ashanti (distr., Ghana, cap. Kumasi); Asmara (Ethiopia, 15.20N 38.58E);

Bafwabaka (Congo-Kinshasa, 2.10N 27.39E); Bafwasio (Congo-Kinshasa, ca. 1.45N 26.30E); Bamun (Cameroun, ca. 5.30N 11E); Banana (Congo-Kinshasa, 5.58S 12.27E); Bangassou (Congo-Brazzaville, 4.41N 22.48E); Barombi (Nigeria, ca. 4.45N 9.20E); Batouri (Cameroun, 4.26N 14.27E); Baudouinville (Congo-Kinshasa, 7.03S 29.42E); Begoro (Ghana, ca. 6.20N 0.20W); Belinga (Gabon, near Mvahdi); Benguela (Angola, 12.34S 13.24E); Bipindi (Cameroun, 3.06N 10.30E); Blantyre (Nyasaland, 15.46S 35.00E); Bogos (distr., Ethiopia, NW. of Asmara); Buta (Congo-Kinshasa, 2.49N 24.50E);

Caconda (Angola, 13.43S 15.03E); Chilimanzi (S. Rhodesia, 19.37S 30.43E);

Dimbokro (Ivory Coast, 6.43N 4.46W); Djaposten (Cameroun, 3.15N 13.30E); Dodoma (Tanganyika, 6.10S 35.40E); Douala (Cameroun, 4.04N 9.43E);

Ebolowa (Cameroun, 2.56N 11.11E); Elmina (Ghana, 5.09N 1.19W); Eseka (Cameroun, 3.40N 10.48E);

Fil Fil (mts., Ethiopia, Eritrea);

Gabon (river, Gabon); Girya (Tanganyika, Mabira forest);

Ikutha (Kenya, 2.05S 38.10E); Irangi (Congo-Kinshasa, ca. 2S 28.20E); Itumba (distr., Tanganyika, W. of Dodoma); Isongo (Nigeria, 4.05N 9.01E);

Kakamega (Kenya, 0.17N 34.37E); Kampala (Uganda, 0.19N 32.35E); Kasai (distr. & river, Congo-Kinshasa); Katande (Congo-Kinshasa, Nat. Albert Park, ca. 0.50S 29.30E); Katanga (distr., Congo-Kinshasa); Katinda (see Kinda); Katona (Tanganyika, near Shirati); Kebrabassa (see Quebrabasa); Kérévé (isl., Ukerewe?); Kibwezi (Kenya, 2.50S 37.57E); Kikuyu (Kenya, 1.14S 36.40E); Kikwit (Congo-Kinshasa, 5.02S 18.51E); Kilimanjaro (mt., Tanganyika, 3.02S 37.20E); Kilimatinde (Tanganyika, 5.52S 34.55E); Kinda (Congo-Kinshasa, 4.48S 21.50E); Kouilou (river, Congo-Brazzaville, ca. 4S 12E); Kribi (Cameroun, 2.56N 9.56E); Kuilo (see Kouilou); Kumasi (Ghana, 6.45N 1.35W); Kwiro (Tanganyika, ca. 8.40S 36.40E);

Limpopo (river, Mozambique-S. Rhodesia-S. Africa); Lindi (Tanganyika, 10.00S 39.41E); Lolodorf (Cameroun, 3.17N 10.50E); Luebo (Congo-Kinshasa, 5.20S 21.23E); Lufira (river, Congo-Kinshasa, upper Katanga); Lulua (river, Congo-Kinshasa, Kasai); Luluabourg (Congo-Kinshasa, 5.53S 22.26E); Lutindi (Tanganyika, S. of Tanga);

Mabira (Tanganyika, 1.15S 30.59E); Magalies (mts., Transvaal, W. of Pretoria); Magnárra (river, Mozambique); Malange (Angola, 9.35S 16.21E); Matadi (Congo-Kinshasa, 5.50S 13.32E); Mazoe (S. Rhodesia, 17.30S 31.03E); Mlanje (Nyasaland, 16.05S 35.29E); Mpala (Congo-Kinshasa, 6.46S 29.30E); Msagaa (Tanganyika, 35 m E. of Singida); Mukenge (Congo-Kinshasa, ca. 6S 22.30E); Mulange (Tanganyika, Mabira forest); Mvahdi (Gabon, 1.13N 13.10E); Mwanza (Tanganyika, 2.30S 32.54E);

Nguelo (Tanganyika, distr. Usambara); Niari (river, Congo-Brazzaville, W. of Brazzaville); Nyasa (lake, Nyasaland etc.);

Palmas (cape, Liberia, 4.25N 7.50W); Panga (Congo-Kinshasa, 1.52N 26.23E); Pangwe (distr., Tanganyika, E. of Lake Nyasa); Prince's I. (Gabon, 1.35N 7.20E); Pungo Adongo (Angola, 9.44S 15.35E);

Quebrabasa (falls, Mozambique, 15.34S 33.00E); Quecaconda (Angola);

Rift Valley (Kenya, 0.36E); Ruaha (river, eastern Tanganyika); Rudolf (lake, northern Kenya); Rutshuru (Congo-Kinshasa, 1.10S 29.26E);

Salisbury (S. Rhodesia, 17.43S 31.05E); Sangha (river, Congo-Brazzaville, ca. 17E); Sangmelima (Cameroun, 2.57N 11.56E); Sankuru (distr., Congo-Kinshasa); Shirati (Tanganyika, 1.10S 34.00E); Sibiti (Congo-Brazzaville, 3.40S 13.24E); Singida (Tanganyika, 4.45S 34.45E); Stanley Falls (Congo-Kinshasa, 0.18N 25.30E); Stanley Pool (Congo-Kinshasa, 4.15S 15.30E); Stanleyville (Congo-Kinshasa, 0.33N 25.14E);

Tanga (Tanganyika, 5.07S 39.05E); Tete (Mozambique, 16.10S 33.35E); Tewe (Tanganyika, distr. Usambara); Tschangopo ("Wiadi", ?);

Ugogo (distr., central Tanganyika); Ukerewe (isl., Tanganyika, 2.09S 32.52E); Usagara (distr., central Tanganyika); Usambara (distr., north-eastern Tanganyika);

Volta (river, Ghana);

Wiadi (?);

Yaoundé (Cameroun, 3.51N 11.31E);

Zambesi (river, south-eastern Africa); Zanzibar (6.10S 39.12E).

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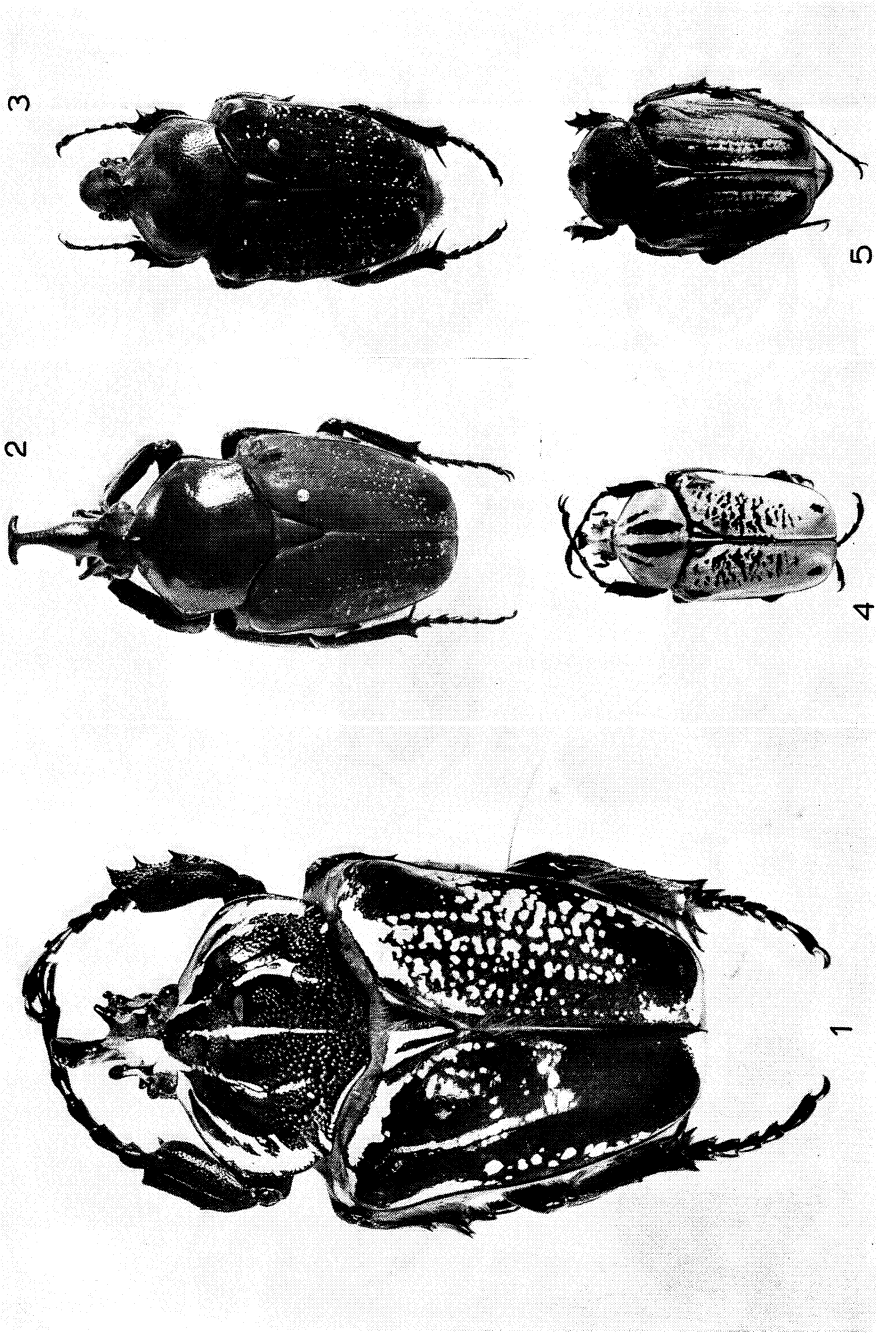
EXPLANATION OF PLATES

Plate 1

Fig. 1, *Goliathus g. goliatus* (L.), gynandromorphous specimen (Mabira Forest, Tanganyika). Fig. 2-3, *Goliathus aureosparsus* (Van de Poll): 2, male (Cameroun); 3, female holotype (Barombi, Nigeria). Fig. 4-5, *Goliathus kolbei* (Kraatz): 4, male (Lutindi, Tanganyika); 5, female (Usambara, Tanganyika). Natural size.

Plate 2

Fig. 1, 4, *Goliathus pluto* Raffray: 1, male lectotype (Bogos, Ethiopia); 4, female (Bogos plateau, Ethiopia). Fig. 2, 5, *Goliathus vittatus* (Bates): 2, male (Vy. Ruaha River, Tanganyika); 5, female (Msagaa, Tanganyika). Fig. 3, 6, *Goliathus peregrinus* (Von Harold): 3, male (Caconda-Benguela, Angola); 6, female (Pungo Adongo, Angola). Fig. 7, *Goliathus higginsi* Westwood, male (Dimbokro, Ivory Coast). Fig. 8, *Goliathus fornasini* Bertoloni, male (Ukerewe I., Tanganyika). Fig. 9, *Goliathus russus* Kolbe, male (Bangassou, Congo-Brazzaville). Natural size.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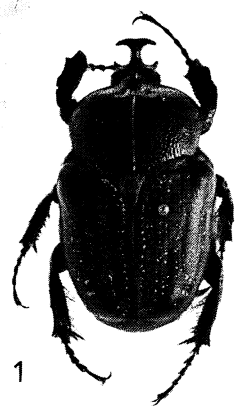
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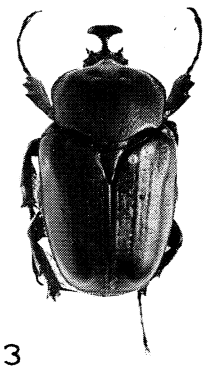
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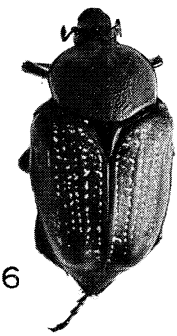
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