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NOTES ON AFRICAN ONITINI, MAINLY FROM SOUTHEASTERN KENYA (COLEOPTERA: SCARABAEIDAE)

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With 44 text-figures and 4 plates

ABSTRACT

Onitini collected in East Africa (mainly southeastern Kenya) are discussed. The distribution of onitine species over Kenya, Tanzania, Uganda, and Tsavo National Park is reviewed (table 1). Three new species and one new subspecies are described and illustrated, viz., *Onitis bispicticollis, kingstoni, pseudojansenii, sulcipennis* subsp. *naromorus* (all from Kenya). For species described from other parts of Africa lectotypes are designated, viz., *Onitis obscurus* Lansberge, *vanderkelleni* Lansberge, *vethi* Lansberge (junior synonym of *fabricii* Roth), *westermanni* Lansberge. *Onitis decellei* Frey is a junior synonym of *O. violaceus* Lansberge and a junior homonym of *O. decellei* Paulian (junior synonym of *viridulus* Reiche). Further notes concern identification, variation, distribution, and ecology of *Onitis, Platyonitis, Cheironitis, Heteronitis, Aptychonitis.*

INTRODUCTION

In this paper I have assembled some notes on African onitine dung-beetles, which are primarily based on material collected during my own travels in East Africa, mainly southeastern Kenya. I have added data concerning other material, including types of African species kept in Leiden, all described by J. W. van Lansberge. A review of the East African fauna of Onitini is given in table 1.

Onitini are burrowing dung-beetles characterized by three traits: their pronotal base has a pair of approximated impressions; the elytral disc is laterally limited by a pseudepipleural ridge; and the incurved fore tibial tips of the males have a thumb-like appearance, bearing neither terminal spur nor tarsus. Each of these characters may be reduced and, moreover, may be found in other scarab tribes, which is undoubtedly due to parallel evolution. At any rate should scarabs possess at least two of the aforesaid properties to qualify as Onitini. Cambefort recently (1975) gave a practical

key to the onitine genera recognized at present. All of these are Ethiopian (and probably of Ethiopian origin), though two extend well into the Palaearctic and Oriental Regions, one even reaching New Guinea. The 1937 monograph and the subsequent partial revisions of Janssens are still outstandingly useful, despite the various additions and reductions published since his untimely death. Consistent with the general distribution over the respective genera (see table in Balthasar, 1963: 8-9), the majority of species treated in the present paper belong to *Onitis* Fabricius. A recent catalogue (Ferreira, 1972) listed 103 subsaharan species of *Onitis*. Meanwhile, there have been 14 additions (Frey, 1975; Ferreira, 1976a, c), one of them being fully reduced below. From Kenya we report here three new species and one new subspecies, all in *Onitis*.

Subspeciation is frequent among East African Onitini, especially in the afromontane element, but with the sporadic material available it would in most cases be premature to take nomenclatural steps. Generally, Onitini have a high degree of structural polymorphism and sexual dimorphism, the expression of which appears to vary geographically. Consequently, it is usually far from easy to settle the identification of entirely female series or single males, and it took some time before I reached the conclusions regarding the new monotypic species proposed here (*Onitis* groups XVII, XIX). After the full scrutiny of my material a few problematic cases remained, which are discussed further below.

Most of my own specimens were collected from elephant dung in the deciduous low orthophyll savanna (Fosberg, 1967) of southeastern Kenya, i.e. in Tsavo National Park. The vegetation of the area is more or less degraded due to heavy elephant impact (Sheldrick, 1973, e.g. photos opposite page 233; other reports). A botanical description of the park section in which most of our scarabs were collected was published by Greenway (1969).

In order to save space, the data concerning the described species are usually summarized by separately giving localities (those in Tsavo first; with my field numbers between parentheses if the same name denotes different localities), altitudes, habitat and dung types, season, all according to my own observations. As quantitative sampling was frequently followed immediately by qualitative selection, any quantitative details regarding the ecology of the respective species are omitted in the present context. Many of the locality names either cannot be found in current atlases and gazetteers, or denote slightly different locations; consequently, I thought it useful to list them all (table 2).

As most literature can easily be traced through the existing synoptic works (Janssens, 1937; Ferreira, 1972, etc.), I have only given some pertinent references.

All the material is kept in Leiden, unless mentioned otherwise; duplicates will be distributed to other collections.

Onitis Fabricius

This is the predominant genus of Onitini. Janssens (1937) divided *Onitis* into 20 species-groups, giving them Roman numerals, which are also used here.

Group III

The species of this group are characterized by the presence of a clypeal ridge, an interrupted clypeofrontal ridge and a frontal tubercle. With the present addition of one new species, the total number of species in this group becomes 23. *Onitis perbrincki* Ferreira from South Africa was the only other species in this group described after Janssens (1937).

Onitis alexis alexis Klug

Notes. — In the Mediterranean region the species is represented by its subsp. *septentrionalis* Balthasar. In East Africa *O. alexis* occurs mixed with the closely allied *viridulus* Reiche, and especially the females may be difficult to name. Some differences are:

1. ♂♀: Elytra and other parts usually more or less brownish, lighter. Longitudinal impression of metasternum strong; pilosity dense. ♂: Underside of fore femur proximally with coniform elevation; anterior-inferior ridge with two denticles. Hind femur posteriorly with simple apex. ♀: Clypeus bisinuate anteromedially. Frontal tubercle with height equal to width . . . . . *alexis*

— ♂♀: Elytra and other parts usually uniformly dark metallic. Longitudinal impression of metasternum superficial or absent; pilosity less dense behind. ♂: Fore femur lacking ornamentation as specified above. Base of posterior spine on hind femur wide, with proximal denticle. Parameres with reflexed angulate apex. ♀: Clypeus rounded anteromedially. Frontal tubercle lower than its own diameter . . *viridulus*

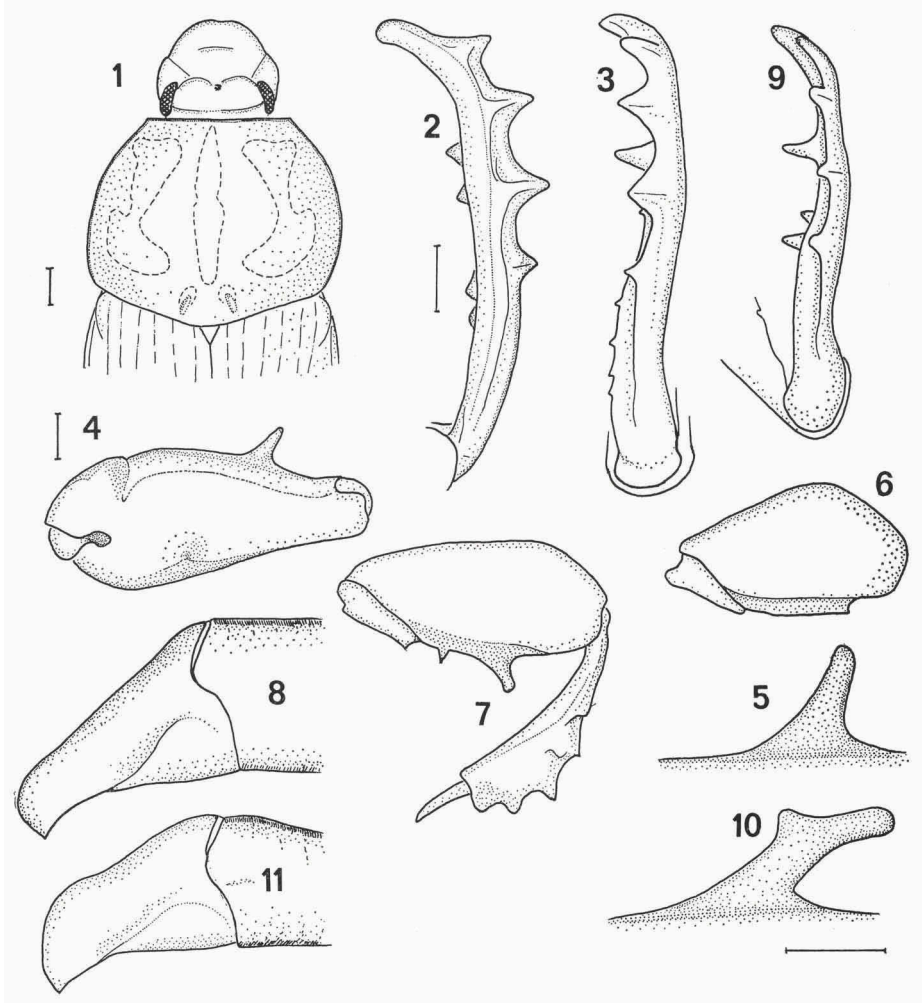
Onitis alexis is very variable, both in characters of structure and coloration; series from one place may be consistently different from those of others.

Material examined. — 16 males, 33 females.

Kenya: Tsavo NP: W of Aruba; Galana-Mbololo; Kilaguni Lodge; Longalonga; Mbololo; Punda Milia; Voi Mzinga; Voi Safari Lodge; Voi River; other localities: Mgange; Mwembeni; Shimba Hills (66, 177). Tanzania: Lake Magadi.

Altitudes 350-1500 m. Deciduous low orthophyll savanna and other open vegetation; elephant, buffalo, cattle dung. Months i, vii, viii, xi, xii.

Distribution. — Syria and Spain to South Africa; pertinent records from western African forest blocks wanting.



Figs. 1-11. Contours of *Onitis bispicticollis* (1-8, ♂ holotype) and *O. picticollis* (9-11, ♂ Johannesburg). — 1, fore body (area inside dashes black); 2, right fore tibia, dorsal; 3, 9, left fore tibia, lateral; 4, left fore femur, ventral; 5, 10, process on ditto, enlarged; 6, left middle femur, ventral; 7, left hind femur and tibia, ventral; 8, 11, parameres, dextrolateral. Scale lines = 1 mm; 2, 3, 9: same scale; 4, 6, 7: same scale; 5, 8, 10, 11: same scale.

Onitis bispicticollis sp. nov. (figs. 1-8, 45-46)

Description (holotype, male). — Approximate length 22, width 11, height 8 mm. Colour yellow, with blackish markings; fore tibiae and other parts infuscated; elytra opaque. Pilosity yellow-brown, abundant, long on pectus, elsewhere om body generally scarcely visible (× 25). Derm generally punctate, microreticulate; metasternum and sides of pectus verrucose-setose. Habitus, fig. 45.

Cephalic contours, disposition of elevations, fig. 1. Clypeus weakly bisinuate anteromedially, margin reflexed; abundantly punctate, punctures isodiametric or slightly transverse, well-defined, their densities ca 9/0.1 sq. mm, diameters ca 0.05 mm, setae scarcely distinct (× 25). Clypeofrontal transition with widely interrupted ridge. Frontal tubercle obsolescent; sculpture and pilosity similar to that of clypeus. Genal surface sparsely punctulate; clypeogenal suture distinct. Vertex with simple transverse ridge. Maximum length of head 4.50, maximum width 5.3 mm; ratio l/w 0.85.

Pronotal contours, disposition of basal grooves, colour pattern (black inside dashes), fig. 1. Pronotum moderately convex, disc flat; anterolateral angles obtuse, posterolateral angles rounded off; posterolateral section scarcely sinuate; apex and lateral borders marginate, base immarginate; basal grooves oblique, well defined, very elongate. Pronotum abundantly, evenly punctate; punctures well defined, approximately isodiametric, mostly separated by a few times their diameter; densities 5-6/0.25 sq. mm, diameters ca 0.05 mm; secondary punctation present, but sparse and indistinct (× 50); microreticulation and pilosity scarcely distinct (× 25). Median length of pronotum 8.3, maximum width 10.2 mm; ratio l/w 0.81. Scutellum rather large (fig. 1), triangular, base as wide as interstria 1.

Elytral interstria 8 horizontal, 9 acclivous laterally; juxtasutural zone shiny; epipleuron invisible from above. Punctures of elytral striae scarcely crenulating interstriae, separated by 2-4 times their diameter. Elytral interstriae not or very slightly convex; punctures abundant, fine, ill defined, their diameters ca 0.03 mm, separated by more than 3 times this diameter. Median length of elytra 8.8, maximum width combined 10.2 mm; ratio l/w 0.86.

Antennal club brown. Prosternum posteromedially unmodified. Metasternal disc with irregular longitudinal blackish marking, glabrous, impunctate anteromedially. Abdominal sternites almost glabrous, punctation irregular, indistinct; microreticulation (× 50) variably distinct. Pygidium entirely marginate; indistinctly punctate-setose (× 50), microreticulate, opaque.

Fore tibia (figs. 2, 3) with 4 well-developed external denticles and long apical thumb-like process; inferior side with (1) + 6 + 1 spines, increasingly developed distad; distal one, opposite emargination between denticles 2 and 3, large, longer than tibial height. Anterior-superior ridge of fore femur (fig. 4, 5) with large simple spine at 0.25-0.35 from apex; anterior-inferior ridge with small denticle, posterior-inferior area with coniform elevation at ca 0.35 from apex; both anterior and posterior sides with fringe of long setae. Posterior lobe of middle femur (fig. 6) distally angulate; trochanter tapering, with blunt apex. Posterior-superior ridge of hind femur (fig. 7) with one large distal and one small proximal process; apex of distal process slightly curved inward; trochanter with bifid apex.

Parameres, fig. 8.

Sexual dimorphism. — Structural differences as usual in this genus. Some features of the females are:

Clypeus more elongate and margin more perfectly arcuate, not bisinuate anteromedially; surface in front of clypeal ridge heavily transversely rugulate, behind ridge moderately transversely rugulate. Fore tibia with four external denticles; underside proximally with serrate ridge.

Variation. — Length ♂ 16-22, ♀ 15-20 mm.

Smaller males have, as usual, reduced secondary sexual characters (protrusions on femora and tibiae), and are difficult to identify on the basis of the table given hereafter. Further variation in the available specimens taxonomically insignificant.

Identification. — *Onitis bispicticollis* is very closely allied with *picticollis* Boheman. Some differences between the males are (see figures):

1. Underside of fore tibia with row of ca 6 small spines and a large distal one. Anterior-superior ridge of fore femur with simple outwardly directed spine. Posterior-superior ridge of hind femur with large denticle moderately strongly directed distad. Apex of hind trochanter bifid . . . . . *bispicticollis* ♂

— Underside of fore tibia with fewer (3), more or less contiguous, large spines. Anterior-superior ridge of fore femur with bifid outwardly directed process. Posterior-superior ridge of hind femur with large denticle very strongly directed distad. Apex of hind trochanter simply acuminate . . . . . *picticollis* ♂

The females of the two species look scarcely distinct to me, but careful study of more material and other characters may in future reveal useful differences. The females of *picticollis* I saw have superficially rugulate, very indistinctly punctulate (× 50) elytral interstriae; those of *bispicticollis* are more even and finely distinctly punctate.

Material examined. — 15 males, 10 females.

Holotype male from Kenya: Tsavo NP: Voi, 31.x.1972, leg. Smeenk; deciduous low orthophyll savanna, elephant dung; 5 male and 4 female paratypes, with same data. Further paratypes as follows: Voi Mzinga, 20.xii (1♂, 2♀), 21-22.xii.1972 (1♂), 19.i.1973 (1♂, 1♀), leg. Krikken; nr Longalonga, 8.xii.1974, leg. Krikken & Van Berge Henegouwen (3 ♂, 3 ♀); all deciduous low orthophyll savanna, elephant dung, nocturnal and diurnal; and from the Nairobi museum: Voi: Mt Rusinga, v.1955, leg. Andinvo (1♂) and Mt Marsabit, iii-iv.1946, leg. Jackson (2♂).

Onitis picticollis Boheman (figs. 9-11)

Note. — The characters of this species are dealt with under the preceding novelty.

Material examined. — 5 males, 2 females.

South Africa: Johannesburg; Lydenburg. — Tanzania: Usambara Mts (coll. Kuyten).

Collected during ii; no further data.

Distribution. — Mozambique, Rhodesia, South Africa, Tanzania (new).

Onitis vanderkelleni Lansberge (fig. 47)

Onitis van der Kelleni Lansberge, 1886: 75 (diagnosis; type-locs Benguela and Humpata).

Notes. — In the Leiden museum are 24 specimens from Benguela and Humpata (Angola), apparently all syntypes. I here designate a lectotype, male, with a locality label reading "P. J./ v. d. Kellen/ Humpata/ Afr. trop. —" (round, in C. Ritsema's handwriting), other labels, and my lectotype label; consequently the others are paralectotypes. They do not differ significantly from the Kenyan specimens mentioned below.

Material examined. — 14 males, 19 females.

Angola: Benguela; leg. Veth & Van der Kellen (6♂, 6♀, paralectotypes); Humpata, leg. Van der Kellen (4♂, 8♀, lectotype ♂ and paralectotypes).

Kenya: Tsavo NP: Chyulu Hills Forest Circuit, 6.xii.1974, 1500 m, multistratal evergreen forest, elephant dung; other Kenyan record: Ol Doinyo Sapuk, 20.xii.1974, leg. Van Berge Henegouwen, 2150 m, buffalo dung.

Distribution. — Angola, Burundi, Cameroun, Kenya, Ruanda, Tanzania, Uganda, Zaire.

Onitis viridulus Boheman

Note. — Some characters of this species are discussed under *O. alexis* Klug.

Material examined. — 11 males, 13 females.

Kenya: Tsavo NP: near Aruba Lodge; Voi Mzinga; Voi Safari Lodge; other locality: Ol Tukai. — Tanzania: Lake Magadi.

Altitudes 450-1500 m. Deciduous low orthophyll savanna; elephant, buffalo, rhino dung, at light. Months i, vii, xi, xii.

Distribution. — Arabia to South Africa; pertinent records from the forest blocks of western Africa wanting.

Group VI

Until recently a monotypic group of western Africa, characterized by a very large, shiny, finely punctate pronotum with obsolescent basal grooves, and by feebly developed clypeogenal ridges. A second species was recently described from Kenya, where we also found this species.

Onitis thoracicus Ferreira (figs. 13, 48-50)

Onitis thoracicus Ferreira, 1976c: 183 (diagnosis; type-loc. Meru NP), figs. 11-19.

Identification. — Ferreira did not compare this species with *laticollis* Lansberge, and therefore I suggest the differences given hereafter (see also figs. 12-13, 48-49). My diagnosis of *laticollis* is based on a male from Senegal (Brussels museum); I have not seen females.

1. Apex of fore tibia bifurcate; interior and inferior side of fore tibia strongly dentate. Fore femur on anterior-inferior ridge with large proximal spine; apex of anterior-superior ridge lobate. Posterolateral border of pronotum sinuate. Basal part of pronotal disc finely, distinctly punctate (× 6). Punctures of elytral striae crenulating interstriae. General colour black . . . . . *thoracicus* ♂

— Apex of fore tibia quadrifurcate; interior and inferior side lacking projections. Fore femur on anterior-inferior ridge halfway with hook; apex of anterior-superior ridge dentate. Posterolateral border of pronotum almost straight. Basal part of pronotal disc apparently impunctate. Punctures of elytral striae indistinct, not crenulating interstriae. General colour dark brown . . . . . *laticollis* ♂

Material examined. — 4 males, 7 females.

Kenya: Tsavo NP: Aruba Lodge; W of Aruba; Dida Harea; Voi Mzinga; Voi River; Voi Safari Lodge; other locality: Wajir (coll. Miskell).

Altitudes 200-600 m. Deciduous low orthophyll savanna; elephant, buffalo dung, and at light. Months i, xi, xii.

Group VII

This group contains some afromontane species that are widespread in

eastern Africa. Series from one locality differ constantly from others, usually in characters of sculpture and colour. These differences between populations certainly must be interpreted as subspeciation, but the material is still too scanty to draw up a consistent picture of the whole East African situation.

Group VII species differ from their nearest relatives by the presence of numerous setae on the pygidium.

Onitis anthracinus Felsche

Note. — Size of my specimens strongly varying; length 15-21.5 mm.

Material examined. — 4 males, 2 females.

Kenya. — Menengai; Naro Moru.

Altitude 2050-2200 m; cultivated area, cattle dung.

Distribution. — Kenya (new), Tanzania.

Onitis parvulus Balthasar (fig. 52)

Onitis parvulus Balthasar, 1963: 289 (diagnosis; type-loc. Kilimandjaro), 292 (in key), fig. 6.

Notes. — Sculpture and colour vary geographically, but further material is needed for a taxonomic evaluation. Structural details like shape of male fore tibia fully agree with the original description. Length 13.5-17 mm.

Material examined. — 14 males, 5 females.

Kenya: Tsavo NP: Chyulu Hills Forest Circuit; Eastern Mau; Mt Elgon; Taita Hills.

Altitudes 1450-2500 m, Montane multistratal evergreen forest; elephant dung. Months iv, ix, xii.

Distribution. — Kenya (new), Tanzania.

Onitis sulcipennis Felsche

Onitis sulcipennis Felsche, 1907: 291 (diagnosis; type-locs Manow, Tanganyika, Natal).

Notes. — The southern specimens I have seen differ so strongly from those collected on the foot of Mt Kenya that in this case a subspecific separation appears justified:

1. Elytral interstriae 2-4 very similar, with distinct medial zone; striae distinct. Posterolateral surface of pronotum moderately, densely punctate; punctures usually separated by at least their own diameter. Clypeal ridge well pronounced, arcuate. Frons abundantly finely punctate. Greenish . . . . . *s. sulcipennis*

— Elytral interstria 4 with less pronounced medial zone; striae largely effaced. Posterolateral surface of pronotum coarsely contiguously punc-

tate. Clypeal ridge obsolescent. Frons coarsely rugulate-punctate. Blackish . . . . . *s. naromorus*

Onitis sulcipennis sulcipennis Felsche stat. nov.

Material examined. — 2 males, 2 females.

Tanzania: Ngurdoto Crater Rim; Usambara.

Altitude 1550 m. Rainforest; unidentified dung.

Distribution. — Tanzania, southward to South Africa.

Onitis sulcipennis naromorus subsp. nov. (fig. 53)

Material examined. — 3 males, 2 females.

Holotype male from Kenya: Naro Moru, 24.iv.1974, leg. Y. Jongema. This place is situated at ca 2050 m. Paratypes with same data; no further details. Length 17-18 mm.

Group IX

This group is mentioned only because a lectotype has to be designated for a junior synonym of the following species.

Onitis fabricii Roth (fig. 51)

Onitis Vethi Lansberge, 1886: 74 (diagnosis; type-loc. Humpata). Janssens, 1937: 79 (synonymy).

Notes. — The labels of the *vethi* lectotype read "Veth/ & v. d. Kellen/ Benguela/ Africa" (round label), "*Onitis/ Vethi*, Lansb./ type ♂" (both in C. Ritsema's handwriting); paralectotypes with similar locality label.

Either Ritsema or Van Lansberge must have made a mistake in citing the locality of the types. Benguela is certainly different from Humpata. D. D. Veth, P. J. van der Kellen & L. J. Goddefroy travelled from Humpata to Benguela and vice versa in 1885, and as no collecting date is given, further precision seems impossible (see Veth, 1887).

Material examined. — 2 males (lectotype and paralectotype), 3 females (paralectotypes).

Group X

This group is, as Janssens (1938) already mentioned in his revision, poorly delimited. We found only one species in East Africa. Ferreira recently (1976a) added four new species.

Onitis keniensis Gillet

Onitis keniensis; Janssens, 1952: 5 (supplementary description), figs. 11-15.

Material examined. — 4 males (including holotype), 1 female.

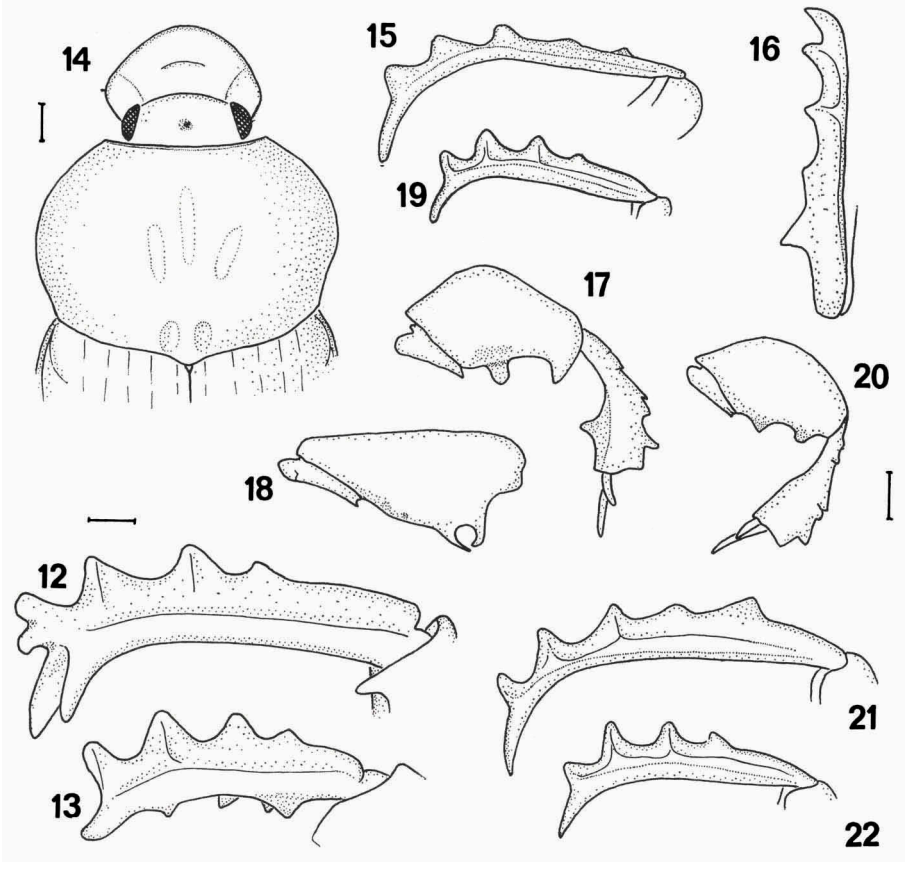
Kenya: Tsavo NP: Chyulu Hills Sign Post 27; other localities: Kedai (type-locality); Shimba Hills. — Tanzania: Klein's Camp.

Altitudes 350-1600 m. Deciduous low orthophyll savanna; elephant dung. Months i, xi, xii.

Distribution. — Kenya, Rhodesia, Tanzania (new).

Group XVI

Two closely allied species occur in Tsavo National Park, one of them only recently described. Group XVI species differ from those of the next group by their non-metallic, uniformly black or brown coloration.



Figs. 12-22. Contours of *Onitis laticollis* (12, ♂ Senegal), *thoracicus* (13, ♂ W of Aruba), *kingstoni* (14-18, ♂ holotype), *westermanni* (19-20, ♂ lectotype), *fulmineus* (21-22, ♂ ♂ Voi). — 12-13, 15, 19, 21-22, right fore tibia, dorsal; 14, fore body; 16, left fore tibia, lateral; 17, 20, left middle femur and tibia, ventral; 18, left hind femur, ventral. Scale line = 1 mm; 12-13, 15-22: same scale.

Onitis granicollis Felsche (fig. 24)

Material examined. — 4 males, 4 females.

Ethiopia: Endessa. — Kenya: Tsavo NP: Voi Mzinga.

Altitudes 500-600 m. Deciduous low orthophyll savanna; elephant dung. Month xii. The male from Endessa, although from Felsche's collection (Dresden), is apparently not a type.

Distribution. — Ethiopia, Kenya (new).

Onitis trochantericus Ferreira (figs. 23, 54-55)

Onitis trochantericus Ferreira, 1976c: 181 (diagnosis; type-loc. Aruba), figs. 1-10.

Identification. — *Onitis trochantericus* was not compared with its closest known relative, *granicollis*, and therefore I suggest the following differences (see also figs. 23-24, 54-55):

1. ♂: Apex of middle trochanter wide, angulate-lobate. Elytral interstriae 6-7 distally simple. Clypeal ridge short; clypeal margin simply arcuate. Clypeofrontal tubercle coniform. Proximal external lobe of fore tibia distinct. ♀: clypeal ridge short; clypeal margin produced-arcuate. ♂♀: Size larger (length 13-16 mm). Elytral interstriae finely punctate . . . . . *trochantericus*

— ♂: Apex of middle trochanter simply tapering. Elytral interstriae 6-7 distally tuberculate. Clypeal ridge long. Clypeal margin apically bisinuate. Clypeofrontal tubercle transverse. Proximal external lobe of fore tibia indistinct or absent. ♀: Clypeal ridge long; clypeal margin produced-(sub)truncate. ♂♀: Size smaller (length 10-13 mm). Elytral interstriae moderately punctate . . . . . *granicollis*

Material examined. — 6 males, 9 females.

Kenya: Tsavo NP: Voi Lion Hill, Voi Mzinga.

Altitudes 500-600 m. Deciduous low orthophyll savanna; elephant dung and at light, apparently nocturnal. Months i, xii, xii.

Group XVII

Janssens (1943b) revised this group, omitting *Onitis obenbergeri* Balthasar (1942: 102). For the interpretation of the characters he used to distinguish the species, considerable experience is needed, as already mentioned in the introduction. After having seen almost all the species, including several types, one very odd male remained, which is here considered to represent a new species.

The species of this group are characterized by their metallic, mostly cupreous coloration and their completely granulate pronotum.

Onitis aerarius Harold

Notes. — Personally I found only one female of this species in Tsavo NP, whereas, peculiarly enough, it was numerous in samples from elephant dung collected there by T. J. Kingston. In larger series, *O. aerarius* can immediately be recognized by their gently wrinkled elytral surface.

Material examined. — 3 males, 9 females.

Kenya: Tsavo NP: Voi Mzinga; other locality: Amboseli (154).

Altitudes 650-1000 m. Deciduous low orthophyll savanna; elephant dung, buffalo carcass. Months i, xi, xii.

Distribution. — Angola, Kenya (new), Malawi, Namibia, Rhodesia, Rwanda, Somalia, Zaire.

Onitis archettii Janssens

Notes. — Hitherto recorded from the original localities only. My specimens agree with the types in all diagnostic characters. The Voi male, however, is very small (13.5 mm long) and reddish, whereas the normal-sized males (14.5-16.5 mm) from the Kuku Plains are greenish.

Material examined. — 5 males, including holotype.

Kenya: Tsavo NP: Voi Mzinga; other locality: Kuku Plains.

Altitude 600-100 m. Deciduous low orthophyll savanna; elephant, cattle dung. Months v, xii.

Distribution. — Ethiopia, Kenya (new).

Onitis fulmineus Janssens (plate 1, figs. 21-22)

Note. — The available series shows a strong degree of polymorphism in the male fore tibia.

Material examined. — 9 males, 10 females.

Kenya: Tsavo NP: Voi Mzinga; other locality: Tana River: Bura.

Altitudes 150-600 m. Deciduous low orthophyll savanna; elephant, rhino, giraffe dung. Months i, x, xii.

Distribution. — Ethiopia, Kenya; Tanzania (Ferreira, 1972: 440) is incorrect if only based on Janssens' mistake that the Tsavo River is situated in Tanzania.

Onitis kingstoni sp. nov. (figs. 14-18, 56)

Description (holotype, male). — Approximate length 16, width 9, height 7 mm. Colour cupreous with tinge of green, opaque. Dorsum with minute setae, pectus abundantly setose; pilosity brownish. Dorsal side of forebody squamulate-granulate; derm generally microreticulate (× 25). Habitus, fig. 56.

Cephalic contours, disposition of elevations, fig. 14. Clypeal margin perfectly arcuate, reflexed; surface squamulate-granulate, transversely rugulate in front; densities of sculptural units on clypeal centre 10-16/0.25 sq. mm, diameters 0.08-0.10 × 0.04-0.08 mm. Frons finely granulate; Vertex medially with low transverse ridges. Genal surface finely granulate; clypeogenal ridge distinct. Maximum length of head 3.70, width 4.60 mm; ratio l/w 0.80.

Pronotal contours, disposition of basal grooves, fig. 14. Pronotum moderately convex; anterolateral angles obtuse; posterolateral angles rounded off, distinctly sinuate in front of these; base indistinctly marginate. Pronotum squamulate-granulate throughout; granulation anteriorly dense, coarse; elsewhere finer and more remote (granules separated by their own diameter); diameters of granules above lateral foveole ca 0.08 × 0.04 mm, densities ca 13/0.25 sq. mm; disc with pattern of slightly elevated smooth bars; basal grooves finely granulate. Median length of pronotum 6.2, maximum width 8.9 mm; ratio l/w 0.69. Interelytral part of scutellum small.

Elytra convex, gradually declivous laterad; pseudepipleural ridge fine, angulate distally; juxtasutural interstriae shiny, with a series of fine, distinct punctures; interstriae 6 and 7 distally with tubercle; epipleural edge distinct from above. Interstriae virtually flat, with two irregular series of fine, distinct punctures. Median length of elytra 6.5, maximum width combined 8.9 mm; ratio l/w 0.73.

Antennal club brown. Meso- and metapectus laterally densely granulate-setose; metasternal disc asperate-setose in front. Abdominal sternites with a transverse series of inconspicuous, medially minute, laterally long setae. Pygidium feebly convex, completely marginate, surface vaguely punctate.

Fore tibia (figs. 15, 16) long and slender, with five external denticles, increasingly developed proximad; underside with 7-8 seriate tubercles; apical thumb very long, but quite robust. Underside of femora punctate-setose. Fore femur anteriorly with superior setae-bearing ridge and inferior ridge, no other projections. Middle tibia (fig. 17) with well-pronounced internal projection at one-third from apex. Middle femur (fig. 17) with apically rounded lobe halfway and acuminate apical-posterior lobe. Hind femur (fig. 18) with two projections curved to each other; proximal section of inferior-posterior ridge irregularly crenulate. Trochanters of middle and hind legs with bifid apex.

Phallus with unmodified, slender, tapering parameres.

Identification. — *Onitis kingstoni* runs to *westermanni* Lansberge in Janssens' key (1943b), but differs in the following male characters (see figures):

1. Middle femur with one apically rounded lobe situated halfway posterior

border and a tapering apical lobe. Fore tibia with five external denticles. Pronotal granulation laterally (above foveole) fine; diameters of granules ca 0.08 × 0.04 mm, densities 13 ± 3/0.25 sq. mm. Punctures of elytral striae indistinct . . . . . *kingstoni*

— Middle femur with two similar lobes on posterior border, apical on concave on its tibial side. Fore tibia with four external denticles. Pronotal granulation generally coarse; diameters of granules (above lateral foveole) ca 0.10 × 0.08 mm, densities 10 ± 3/0.25 sq. mm. Punctures of elytral striae distinct . . . . . *westermanni*

Material examined. — Holotype male, from Kenya: Tsavo NP: near Voi, 18.xii.1973, leg. Kingston, elephant dung.

Note. — This description is dedicated to the ecologist Mr T. J. Kingston, collector of the unique specimen.

Onitis lobipes Felsche

Note. — Hitherto only recorded from the type-locality, Mt Kilimanjaro, and collected by us on the nearby Kuku Plains.

Material examined. — One male, from Kenya: Kuku Plains, 5.xii.1974, leg. Krikken & Van Berge Henegouwen; 900-1000 m; deciduous low orthophyll savanna, cattle dung.

Distribution. — Kenya (new), Tanzania.

Onitis malleatus Janssens

Notes. — Hitherto only recorded from the type-locality, Kigonsera on Lake Nyassa. Outstanding by the malleate-punctate underside of the middle and hind femora.

Material examined. — One male, from Tanzania: Lindi, no further data.

Distribution. — Tanzania.

Onitis obscurus Lansberge (fig. 57)

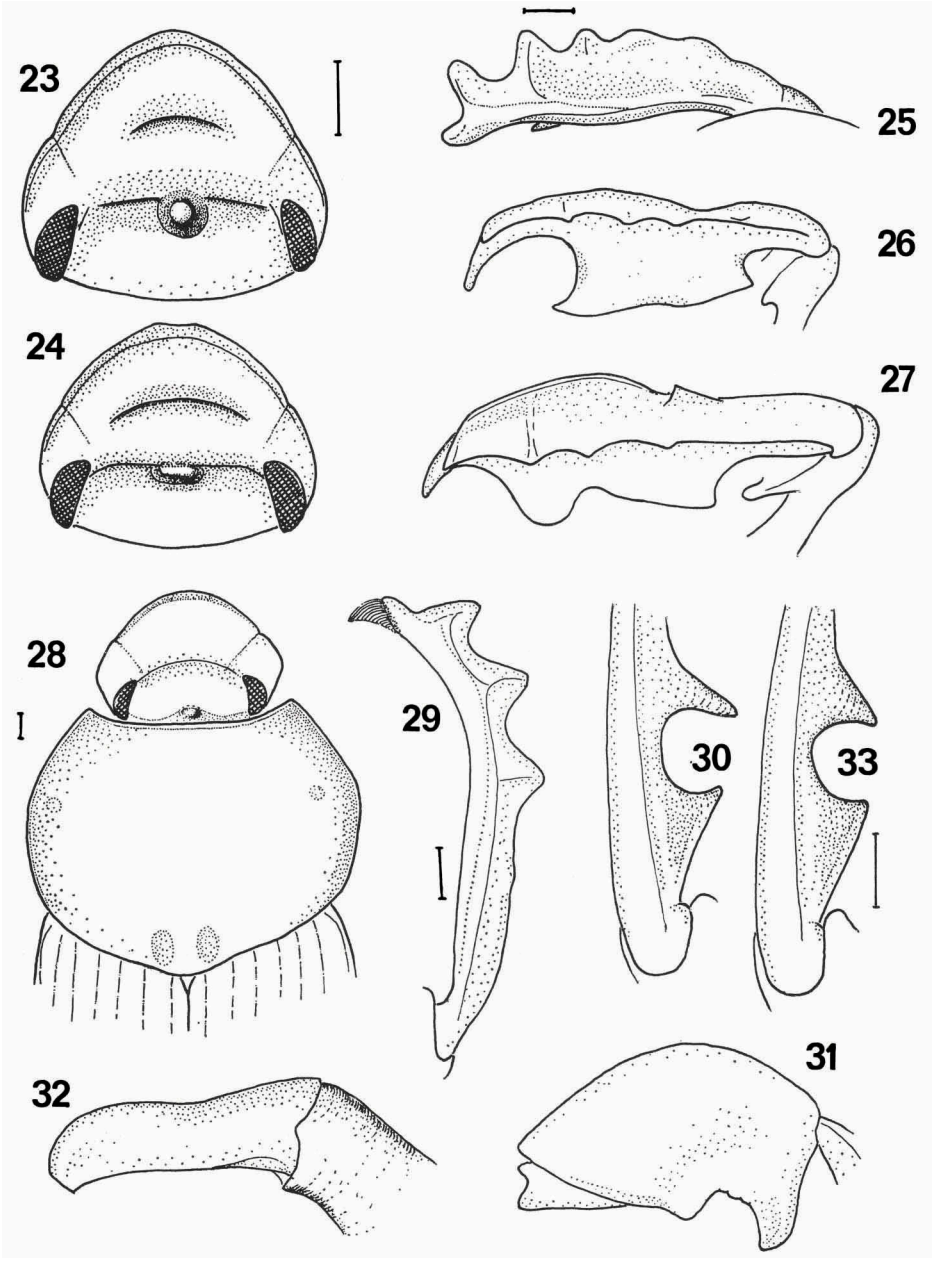
Onitis obscurus Lansberge, 1886; 76 (diagnosis; type-loc. Humpata). Janssens, 1937: 37 (in key), 101 (diagnosis, records); 1943: 8 (in key), 14 (records).

Notes. — I here designate a lectotype, male, with labels reading "Veth/& v. d. Kellen/Benguela/Africa" (round), "type" (both in C. Ritsema's handwriting); locality label of paralectotype female similar.

The contradiction between label data and the type-locality as given by Van Lansberge is discussed under *O. fabricii* Roth.

Material examined. — 1 male (lectotype), 1 female (paralectotype), as mentioned.

Distribution. — Angola.



Figs. 23-33. Contours of *Onitis trochantericus* (23, ♂ Voi Mzinga), *granicollis* (24, ♂ Tsavo NP), *laminosus* (25-26, ♂ Seronera), *denticoxa* (27, ♂ holotype), *pseudojansenii* (28-32, ♂ holotype), *jansenii* (33, ♂ Klein's Camp). — 23, 24, head, full-face; 25, 29, right fore tibia, dorsal; 26-27, left fore tibia, lateral; 31, left middle femur; 32, parameres, dextrolateral. 28, fore body; 30, 33, proximal section of right fore tibia, dextrolateral. Scale lines = 1 mm; 23-24, 30, 32-33: same scale; 25-27, 29, 31: same scale.

Onitis westermanni Lansberge (figs. 19, 20, 58)

Onitis westermanni Lansberge, 1886: 77 (diagnosis; type-loc. Zambèze). Péringuey, 1901: 120 (in key), 129 (original diagnosis in English). Janssens, 1937: 37 (in key), 101 (diagnosis, records), fig. 60; 1943: 9 (in key), 15 (records), fig. 3.

Notes. — In Leiden there are four syntypes, of which one, a male, is here designated lectotype; it has a printed locality label reading "Bradshaw/ Zambesi/1878". What exactly is meant with Zambesi is not clear; in any case visited a Dr. Bradshaw the Victoria Falls during 31 Dec. 1874-1 Jan. 1875 (Fagan, 1964 : 41). Janssens recorded *westermanni* from the Tsavo River, but this record needs confirmation (compare his figure of the male middle leg with my fig. 20). For diagnostic remarks, see under *kingstoni*.

Material examined. — 1 male (lectotype), 1 male (paralectotype), 2 females (paralectotypes), as mentioned.

Distribution. — ? Kenya, Namibia, Rhodesia, Zambia, Tanzania.

Group XVIII

The members of this group, revised by Janssens (1951), are characterized by three features: clypeal ridge absent; pronotal base marginate; colour black or brown, non-metallic. Ferreira (1976a) added two species, both from East Africa. One was already found by us, and, Ferreira not giving diagnostic information, this species is here compared with its nearest relative.

Onitis laminosus Ferreira (figs. 25-26, 59)

Onitis laminosus Ferreira, 1976a: 173 (diagnosis; type-loc. Narok).

Identification. — This species runs to *denticoxa* Müller in Janssens' key, and, having studied the holotype of that species, I suggest the following differences (see also figs. 25-27, 59):

1. Carina on inferior side of fore tibia angulate in front, scarcely shagreened, shiny; superior side of fore tibia lacking denticle; apical thumb and apical external denticle of approximately equal length. Hind femoral denticle long, slender. Ratio median length frons/clypeus 10/11. Pygidium distinctly convex. Metasternal disc glabrous . . *laminosus* ♂

— Carina on inferior side of fore tibia lobate in front, shagreened, opaque; superior side of fore tibia with denticle opposite basal bisinuate lobe; apical thumb longer than apical external denticle. Hind femoral denticle broad, robust. Ratio median length frons/clypeus 12/15. Pygidium almost plane. . . . . *denticoxa* ♂

Material examined. — One male, from Tanzania; Serengeti NP: Seronera, 11.i.1973, leg. Krikken, savanna, fresh buffalo dung.

Distribution. — Kenya, Tanzania; apparently widespread in Masailand. Altitudes 1200-1900 m. Months i, iv, v, vi.

Onitis nubiensis Lansberge

Material examined. — A single female, from Tsavo NP: W of Aruba, 28.xi.1974, leg. Krikken & Van Berge Henegouwen, 500 m, deciduous low orthophyll savanna, elephant dung.

Distribution. — Kenya (new), Mozambique, Nubia, Zaïre.

Onitis uncinatus Klug

Material examined. — 4 males, 1 female.

Kenya: Tsavo NP: Voi Mzinga; W of Chyulu Gate; other Kenyan locality: Kuku Plains. — Tanzania: near Lake Magadi.

Altitudes 600-1500 m. Deciduous low orthophyll savanna; elephant, rhino, buffalo, cattle dung. Months i, xii.

Distribution. — Widespread in subsaharan Africa, but no explicit records from Guinea coast countries available.

Group XIX

This group, characterized by the lack of a clypeal ridge, the non-metallic black or brown coloration, and the immarginate pronotal base, needs a serious revision. Couplets 4 and 5 of Janssens' key (1937: 41-42) are unsuitable for the (usually more common!) medium-sized and smaller males, the protrusions of both middle and hind femora being variably reduced. It would be better to use less variable characters, like the apex of the male fore tibiae, the protrusions on their underside, and some structural details of the head. As the characters of the females were insufficiently diagnosed by Janssens and others, the difficulties encountered with regard to a proper allocation of females were considerable, and I am not entirely satisfied with my own results. Tentatively, I classified my specimens as follows (see also notes under respective species, and corresponding figures).

1. Males (terminal spur of fore tibia absent) 2
— Females (terminal spur of fore tibia present) 6
2. Apex of fore tibia with thumb indistinctly separated from apical-external denticle 3
— Apex of fore tibia with thumb distinctly separated from apical-external denticle 4
3. Thumb not prominent (short) . . . . . *lycophron*
— Thumb prominent (long) . . . . . *inversidens*

4. Underside of fore tibia proximally with uninterrupted ridge only . . . . . *mendax*
— Underside of fore tibia proximally with two separated protrusions . 5
5. Second inferior protrusion of fore tibia slender, spiniform. Angle apical thumb — apical external denticle ca 100°. Middle femur posteriorly with two lobes separated by emargination. Generally more opaque . . . . . *pseudojansenii*
— Second inferior protrusion of fore tibia more robust, dentiform. Angle apical thumb — apical external denticle ca 135°. Middle femur posteriorly only with apical lobe and strongly crenate edge. Generally more shiny, subcupreous . . . . . *jansenii*
6. Clypeal margin entirely reflexed 7
— Clypeal margin only anteromedially reflexed. Pronotal punctation coarse, dense 8
7. Median tubercle on ridge of vertex low, notched. Pronotum shiny, finely punctate; punctures on centre of pronotum mostly separated by more than their own diameters . . . . . *inversidens*
— Median tubercle on ridge of vertex high, notched. Pronotum coarsely, densely punctate, hence more or less dull; punctures on centre of pronotum separated by less than their own diameters . . *pseudojansenii*
8. Median tubercle on ridge of vertex high, length equal to width *jansenii*
— Median tubercle on ridge of vertex low, transverse, notched . . *mendax*

Onitis inversidens Lansberge (fig. 35)

Notes. — This is a common, variable species, easily recognizable by the shape of the male fore tibia. As with *O. mendax*, the underside of the male fore tibia has proximally an uninterrupted, in lateral view arcuate ridge. The record from Chyulu Gate is based on a relatively small brown male (length 17.5 mm) without the usually extensive protrusions on the legs. All the characters, however, agree with *inversidens* as classified here (see key above), and therefore it is identified as such.

Material examined. — 25 males, 25 females.

Kenya: Tsavo NP: Aruba Lodge; W of Aruba; Chyulu Hills Forest Circuit; Chyulu Gate; Longalonga; Shaitani Lava Flow; Tsavo; Voi, mainly Lion Hill and Mzinga; Voi Safari Lodge; other Kenyan localities: Samburu Game Reserve; Taveta.

Altitudes 450-1500 m. Deciduous low orthophyll savanna; multistratal evergreen forest; elephant, buffalo dung; also at light. Months i, iv, v, vii, xi, xii.

Distribution. — Ethiopia to Rhodesia.

Onitis jansenii Gomes Alves (figs. 33, 37)

Note. — Here the ridge on the underside of the male fore tibia is interrupted, forming (in lateral view, fig. 33) two opposing denticles.

Material examined. — 7 males, 7 females.

Kenya: N of Klein's Camp. — Tanzania: Klein's Camp.

Altitude 1700 m. Deciduous low orthophyll savanna; elephant dung. Month i.

Distribution. — Kenya (new), Mozambique, Tanzania (new).

Onitis lycophron Klug (fig. 34)

Material examined. — A single male, Kenya: Kuku Plains, 6.xii.1974, leg. Krikken & Van Berge Henegouwen; 900-1000 m; deciduous low orthophyll savanna, cattle dung.

Distribution. — Ethiopia, Kenya (new), Mozambique, Rhodesia, Tanzania, Zaïre.

Onitis mendax Gillet (fig. 36)

Material examined. — 7 males, 3 females.

Kenya: Tsavo NP: W of Chyulu Gate; Voi Mzinga. N of Klein's Camp, on the Kenya-Tanzania border. In none of these places males and females were collected together, and therefore the association of both sexes (as in the key given above) remains uncertain.

Altitudes 450-1700 m. Deciduous low orthophyll savanna; elephant dung. Months i, xi, xii.

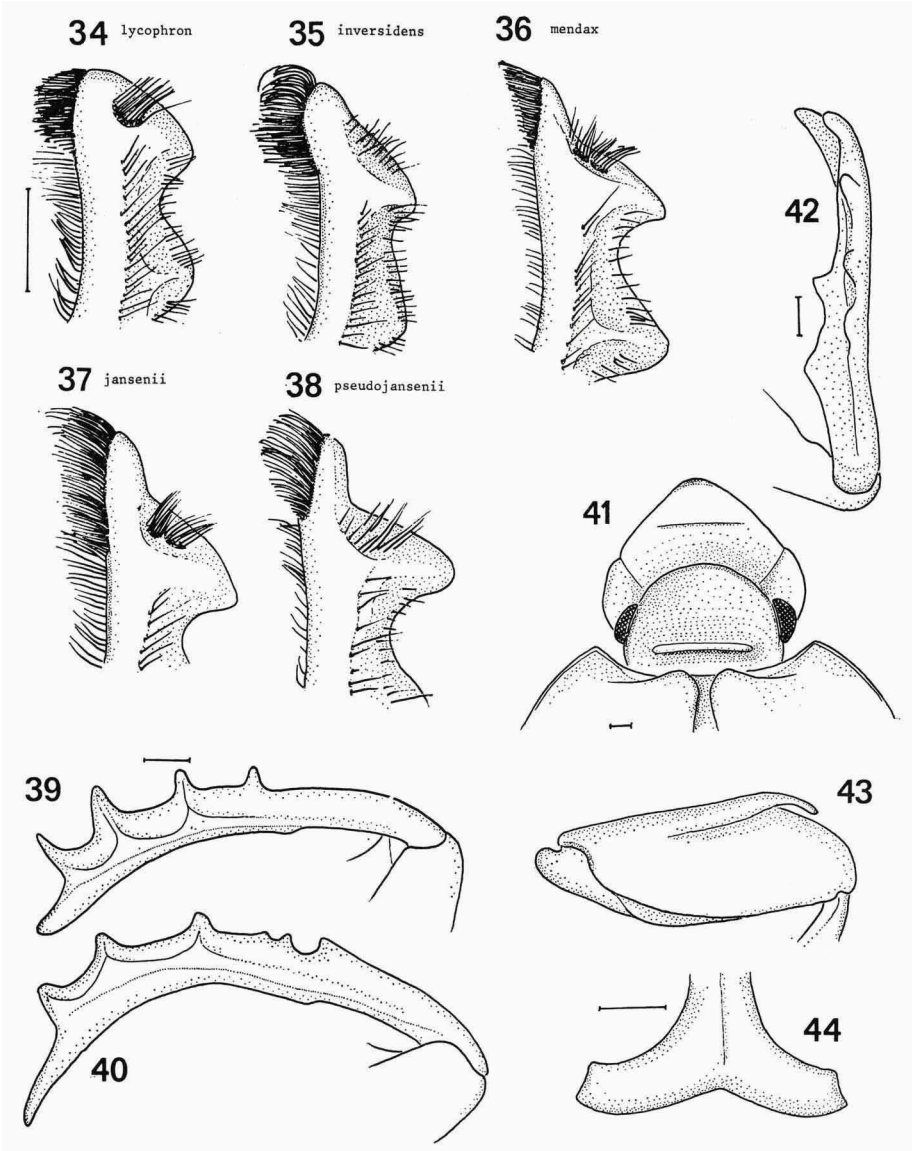
Distribution. — Hitherto only recorded from the type-locality "Sud-Ouest du volcan Gurui", apparently in Tanzania: ? Sagara; Kenya then would be a new country record.

Onitis pseudojansenii sp. nov. (figs. 28-32, 38, 60)

Description (holotype, male). — Approximate length 24, width 13.5, height 9 mm. Colour black, subopaque. Dorsum virtually glabrous, pectus abundantly setose. Derm microreticulate (× 25). Habitus, fig. 60.

Cephalic contours, disposition of elevations, fig. 28. Clypeal margin arcuate, reflexed, apex extremely feebly bisinuate; clypeal derm transversely granulate-rugulate, densities of sculptural units 18-22/0.25 sq. mm, their diameters ca 0.1 mm. Frons densely granulate. Genae densely granulate; clypeogenal suture distinct, not raised. Maximum length of head 5.2, maximum width 7.1 mm; ratio l/w 0.74.

Pronotal contours, disposition of basal grooves, fig. 28. Pronotum moderately convex; anterolateral angles ca 90°, posterolateral angles widely



Figs. 34-44. Fore tibial tips of ♂♂ of *Onitis lycophron* (34), *inversidens* (35), *mendax* (36), *jansenii* (37), *pseudojansenii* (38); contours of *Cheironitis benningseni* (39-40, ♂♂ Tsavo NP), *Heteronitis* near *tricornutus* (41-44, ♂ Samburu). — 39-40, right fore tibia, dorsal; 41, head and part of pronotum; 42, left fore tibia, lateral; 43, left middle femur; 44, postprosternal process. Scale lines = 1 mm; 34-38: same scale; 39-40: same scale; 42-43; same scale.

rounded, weakly sinuate in front of these; base immarginate. Pronotal disc abundantly punctate, sides asperate-punctate, lateral marginal zone densely granulate; basal grooves finely, densely granulate; discal punctures well defined, approximately isodiametric, their densities 17-23/sq. mm, diameters ca 0.1 mm. Median length of pronotum 4.60, maximum width 6.1 mm; ratio l/w 0.76. Interelytral part of scutellum small, triangular.

Elytra moderately convex, gradually declivous laterad; pseudepipleural ridge sharp; epipleural edge distinct from above; distal declivity setose. Interstriae scarcely convex, with fine, abundant punctures. Striae shallow, but well defined; with densely, evenly spaced punctures (× 25). Median length of elytra 5.3, maximum width combined 5.9 mm; ratio l/w 0.90.

Antennal club blackish with some brown spots. Pectus largely granulate-setose; metasternum densely asperate-setose. Abdominal sternites laterally with indistinct transverse row of seta-bearing punctures, derm smooth, opaque.

Fore tibia (fig. 29) long and slender, with three well-developed external denticles; underside with large spine at ca 0.3 from base placed opposite acuminate basal denticle (fig. 30). Femoral surfaces largely glabrous or sparsely setose; posterior side of fore femur, anterior side of middle femora densely asperate-setose. Shape of fore femur unmodified, with simple anterior-superior and anterior-inferior ridge. Middle femur (fig. 31) posteriorly with two angulate lobes enclosing arcuate emargination with coarsely crenulate edge. Hind femur anteriorly retrodentate, posteriorly elongately dentate; anterior denticle very slender, curved. Middle and hind tibiae robust; inner side of middle tibia sinuate in dorsal view. Trochanters of middle and hind legs slender, with acute apex.

Phallus with unmodified, apically rounded parameres.

Identification. — See key given above.

Material examined. — Holotype male, from Kenya: Tsavo NP: near Voi, leg. Kingston. Three females, same data, not paratypes, tentatively assigned to this species.

Group XX

Contrary to group XIX, the species of this group are more or less metallic, a point overlooked with the recent addition to *Onitis* proposed by Frey (1975).

Onitis violaceus Lansberge

Onitis violaceus Lansberge 1875: 51 (in key), 84 (diagnosis; type-loc. Galam). Janssens, 1937: 44 (in key), 126 (diagnosis, records), fig. 81.

Onitis decellei Frey; 1975: 292 (diagnosis; type-loc. Guinea), figs. 1-2. **Syn. nov.**; non *decellei* Paulian, 1933: 12 (= *viridulus* Reiche).

Notes. — As I tried to place *O. decellei* Frey, the resemblance of the figure of the middle femur to fig. 81 of Janssens struck me, and after having compared the diagnoses I can only conclude that Frey misplaced his specimens in group XIX. In addition, an already available name was overlooked. *O. violaceus* is now known from Senegal, Guinea-Bissau, Upper Volta, Nigeria.

Platyonitis Janssens

The occurrence of *Platyonitis* in Kenya was treated in detail by Krikken (1974) and Zunino (1974, 1975). Only new localities, ecological summaries and size ranges are given here.

Ferreira recently (1976b) added a new species from Angola, and noted that the presence or absence of the clypeal ridge is not a generic character. If the Angolan *Platyonitis* is placed correctly, one wonders, seeing how little is left of the diagnostic characters, whether the separation of *Onitis* and *Platyonitis* is still justified.

Platyonitis oberthuri Janssens

New material examined. — 24 specimens.

Kenya: Tsavo NP: W of Aruba; near Longalonga; Maungu Plains (139, 175).

Altitudes 500-900 m. Deciduous low orthophyll savanna; elephant, rhino, buffalo dung, and at light. Months i, ii, iv, xi, xii. Length 13.5-19 mm.

Distribution. — Kenya, Mozambique.

Platyonitis smeenkorum Krikken

New material examined. — 25 specimens.

Kenya: Tsavo NP: W of Aruba; Buffalo Wallows (135); near Longalonga; Manyani; Maungu Plains (139, 175); Voi Lion Hill.

Altitudes 400-800 m. Deciduous low orthophyll savanna; elephant, waterbuck dung, and at light. Months i, iv, v, xi, xii. Length 12-22 mm.

Cambefort (1975, in litt.) saw a specimen from Ethiopia: near Kebre-Mengist, 12-15.xi.1973, leg. Rougeot, 1800-2000 m, in the Paris museum.

Distribution. — Ethiopia (new), Kenya.

Cheironitis Lansberge

Three characters are used to separate the members of this genus from other genera, viz., the large scutellum, the presence of a postprosternal protrusion in the males, and the presence of tarsi on the female fore tibiae.

The second feature is wanting in a *Cheironitis* here placed near *muelleri* Janssens.

I prefer to use the original spelling of the generic name instead of *Chironitis*.

Cheironitis bennigseni Felsche (figs. 39-40)

Notes. — The fore tibiae (figs. 39-40) and other parts are strongly polymorphic. All my specimens are cupreous red.

Material examined. — 5 males, 4 females.

Kenya: Tsavo NP: Ndara Plains; ENE of Voi; Voi Safari Lodge.

Altitudes 550-600 m. Deciduous low orthophyll savanna; elephant, buffalo dung. Months xi, xii.

Distribution. — Hitherto recorded from two localities: Dar-es-Salaam (Tanzania), Tsavo River (Kenya).

Cheironitis near **imitator** Balthasar (fig. 61)

Notes. — The specimens listed below are close to *Ch. imitator* Balthasar and *indicus* Lansberge. They agree with most features given for *imitator*; the holotype, however, was not available, and therefore I give the present identification with some reservations.

Material examined. — 5 males, 7 females.

Kenya: Tsavo NP: W of Aruba; Dida Harea; Shaitani Lava Flow; ENE of Voi; Voi River; Voi Safari Lodge.

Altitudes 450-900 m. Deciduous low orthophyll savanna; buffalo, elephant dung. Months xi, xii.

Distribution. — Ethiopia, Kenya (new), Sudan.

Cheironitis muelleri Janssens

Notes. — One male was found in Amboseli and as the description of the postprosternal protrusion of *Ch. muelleri* did not fit, it was compared with the type-series. All the 5 male types from Uarandab (Ethiopia) had the postprosternal protrusion, which is entirely lacking in the Amboseli specimen. In the other characters (e.g., shape of fore and middle tibiae, see Janssens, 1943: 7) they are very similar. Possibly this is also a case of subspeciation.

Material examined. — One male from Kenya: Amboseli NP: Ol Tukai, 5.xii.1974, leg. Krikken & Van Berge Henegouwen; 1100-1200 m; deciduous low orthophyll savanna, wildebeest dung.

Distribution. — Ethiopia, Kenya (new).

Heteronitis Gillet

The species of *Heteronitis* were revised by Janssens (1942) and since

then *audens* Péringuey was moved to *Cheironitis*. The genus is widespread but uncommon in subsaharan Africa. They are very large Onitini, the males of which have a characteristic postprosternal projection (one is shown in fig. 44); females are remarkable for the high transverse elevation on their vertex.

Heteronitis castelnaui (Harold)

Material examined. — 6 males, 7 females.

Kenya: Tsavo NP: Voi Lion Hill; other localities: Shimba Hills (177); N of Klein's Camp.

Tanzania: 20 km SE of Seronera.

Altitudes 350-1600 m. Deciduous low orthophyll savanna; elephant, zebra dung, nocturnal. Months i, xi, xii.

Distribution. — Southern Kenya (new) to Congo, Namibia and South Africa.

Heteronitis near **tricornutus** (Fairmaire) (figs. 41-44)

Notes. — One male found in Central Kenya keys to *tricornutus* in Janssens' key (1942). Some notable properties of this specimen are: Transverse ridge of vertex not tuberculate medially. Anterior side of pronotum with pair of callosities (fig. 41) whereas derm bears long, densely set brown setae. Elytral interstriae 2 and 5 convex, opaque, abundantly punctate and locally more or less rugulate. Pseudepipleural ridge of elytra very sharp. Underside of fore tibia with lamella. Postprosternal projection (fig. 44) bifurcate, outward tips truncate. Underside of fore femur with row of tubercles. Middle femur (fig. 43) with elongate anterior-inferior projection.

The position of this male remains uncertain, because (1) polymorphism and sexual dimorphism are notoriously well developed in the genus, (2) *tricornutus* is based on a single female from Somalia, and (3) the characters of this male differ from those of the males diagnosed by Janssens.

Material examined. — One male from Kenya: Samburu (182), 16.xii.1974, leg. Krikken & Van Berge Henegouwen; ca 900 m, deciduous low orthophyll savanna, elephant dung.

Aptychonitis Janssens

The two known species differ from all other Onitini by the lack of a pseudepipleural ridge on the elytra. One species occurs in Senegal, the other in eastern Africa.

Aptychonitis anomalus (Gestro)

Chironitis lohsei Balthasar; Cambefort, 1976: 270 (synonymy).

Material examined. — 7 males, 6 females.

Kenya: Tsavo NP: Buffalo Wallows; Lugard's Falls region; Manyani; Ndara Plains; Voi River.

Altitudes 500-600 m. Deciduous low orthophyll savanna; elephant, buffalo dung. Months i, xi, xii.

Distribution. — Ethiopia, Kenya, Tanzania. Janssens (1937) already mentioned Tsavo River.

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TABLE 1

List of Onitini recorded from Kenya (K), Tanzania (T), Uganda (U), East Africa without specification (E), Tsavo National Park (X). After Janssens (1937), Ferreira (1974), other sources, personal observations. Records marked with an asterisk are apparently additions to the national fauna concerned.

Aptychonitis					
anomalus (Gestro)	K	T	—	E	X
Cheironitis					
bennigseni Felsche	*K	T	—	—	X

dentifemoralis Ferr.	K	—	—	—	—
flabellatus Bouc.	—	—	—	?E	—
nr *imitator* Balth.	*K	—	—	—	X
muelleri Janss.	*K	—	—	—	—
stuhlmanni Kolbe	K	T	—	—	—
Heteronitis					
castelnaui (Har.)	*K	T	—	—	X
nr *tricornutus* (Fairm.)	*K	—	—	—	—
Onitis					
adelphus Kolbe	—	T	—	—	—
aerarius Har.	*K	—	—	—	X
affinis Felsche	K	—	—	—	—
alexis alexis Klug	K	T	—	E	X
anthracinus Felsche	*K	T	—	—	—
archettii Janss.	*K	—	—	—	X
bispicticollis sp. nov.	*K	—	—	—	X
confusus Boh.	K	—	—	E	—
consanguineus Felsche	K	T	U	—	—
coxalis Gillet	—	T	—	—	—
crenatus Reiche	K	T	—	E	—
cryptodus Gillet	—	—	U	—	—
deceptor Péring.	—	T	—	—	—
dimidiatus Felsche	—	T	—	—	—
fractipes Bouc.	K	—	—	—	—
fulgidus Klug	K	T	?U	—	—
fulmineus Janss.	K	—	—	—	X
granicollis Felsche	*K	—	—	—	X
inflaticollis Felsche	—	T	—	—	—
inversidens Lansb.	K	—	—	E	X
jansenii G. A.	*K	*T	—	—	—
keniensis Gillet	K	*T	—	—	X
kingstoni sp. nov.	*K	—	—	—	X
laminosus Ferr.	K	T	—	—	—
lamnifer Gillet	—	T	—	—	—
lobipes Felsche	*K	T	—	—	—
lycophron Klug	*K	T	—	—	—
malleatus Janss.	—	T	—	—	—
mendax Gillet	—	T	—	—	—
meyeri Kolbe	*K	T	—	—	X
monstrosus Felsche	—	—	U	—	—
nubiensis Lansb.	*K	—	—	—	X
orthopus Lansb. var.	—	T	—	—	—
paramniszechi Ferr.	K	T	—	—	—
parvulus Balth.	*K	T	—	—	X
picticollis Boh.	—	*T	—	—	—
pseudojansenii sp. nov.	*K	—	—	—	X
pseudoorthopus Ferr.	K	—	—	—	—
pumilio Balth.	K	—	—	—	—
reichei Lansb.	—	T	U	—	—
robustus Boh.	—	T	U	—	—
setosus Lansb.	—	T	—	—	—
similis Felsche	—	T	—	—	—
sphinx (F.)	K	T	U	—	—

spinicrus Fairm.	—	T	—	—	—
subcrenatus Kolbe	—	T	U	—	—
sulcipennis sulcipennis Felsche	—	T	—	E	—
sulcipennis naromorus ssp. nov.	*K	—	—	—	—
thoracicus Ferr.	K	—	—	—	X
trochantericus Ferr.	K	—	—	—	X
uncinatus Klug	K	T	U	—	X
vanderkelleni Lansb.	K	T	U	—	X
viridulus Boh.	*K	T	U	E	X
westermanni Lansb.	?K	T	—	—	?X
Platyonitis					
oberthuri Janss.	K	—	—	—	X
smeenkorum Krikken	K	—	—	—	X
total number of spp. 64	44 + ?1	39	10 + ?1	7 + ?1	24 + ?1

TABLE 2

Approximate location of East African localities from which material was studied (those marked with an asterisk refer to collections not made by the author). Names of regions not listed.

Amboseli (154)	2°42′S	37°19′E	1000 m
Amboseli (155)	2°43′S	37°20′E	1000
Aruba Lodge	3°21′S	38°47′E	450
Aruba, W of	3°22′S	38°44′E	500
Buffalo Wallows	3°10′S	38°35′E	500
*Bura	1°06′S	39°57′E	150
Chyulu Gate	2°55′S	38°02′E	850
Chyulu Gate, W of	2°55′S	37°58′E	850
Chyulu Hills Forest Circuit	2°47′S	37°57′E	1450–1550
Chyulu Hills Sign Post 27	2°48′S	37°56′E	1450
Dida Harea	3°35′S	38°50′E	450
*Eastern Mau	0°28′S	35°58′E	2280
*Elgon, Mt	1°04′S	34°44′E	2500
Galana-Mbololo	3°04′S	38°46′E	350
*Kedai	3°16′S	38°21′E	950
Kilaguni Lodge	2°55′S	38°04′E	850
Klein's Camp	1°47′S	35°13′E	1700
Klein's Camp, N of	1°42′S	35°11′E	1700
Kuku Plains	2°54′S	37°46′E	900–1000
*Lindi	10°00′S	39°41′E	sea-level
Longalonga	3°07′S	37°59′E	650–700
Lugard's Falls	3°03′S	38°41′E	300
Magadi, Lake	2°27′S	34°48′E	1500
Manyani	3°05′S	38°30′E	550–650
*Marsabit, Mt	2°17′N	37°57′E	1350
Maungu Plains (139)	3°33′S	38°51′E	450
Maungu Plains (175)	3°33′S	38°47′E	450
*Menengai	0°14′S	36°06′E	2200
Mbololo	3°12′S	38°31′E	550
Mgange	3°24′S	38°18′E	1200–1300

Mwembeni	3°46'S	39°10'E	390
Naromoru	0°09'S	37°01'E	2050
Ndara Plains	3°23'S	38°43'E	550
*Ngurdoto Crater Rim	3°18'S	36°55'E	1550
*Ol Doinyo Sapuk	1°09'S	37°15'E	2150
Ol Tukai	2°41'S	37°16'E	1000
Punda Milia	3°07'S	38°45'E	500–600
Samburu (182)	0°37'N	37°38'E	900
Seronera	2°25'S	34°48'E	1500
Seronera, 20 km SE of	2°30'S	34°58'E	1500–1600
Shimba Hills (66)	4°15'S	39°25'E	350–400
Shimba Hills (177)	4°13'S	39°28'E	350
*Taveta	3°24'S	37°41'E	750
Tsavo	2°59'S	38°26'E	500
Voi, ENE of	3°21'S	38°39'E	550
Voi Lion Hill	3°21'S	38°35'E	500–600
Voi Mzinga	3°21'S	38°37'E	600
Voi River	3°23'S	38°43'E	500
Voi Safari Lodge	3°21'S	38°35'E	600
*Wajir	1°45'S	40°04'E	200

Locality in East Africa mentioned in this paper, not located:
"Voi Mt. Rusinga" (= ? Rukinga, 3°51'S—38°45'E).

Other East African localities mentioned in this paper:
Kenya: Meru NP, Narok.
Tanzania: Gurui (= ? Guru).

Localities outside East Africa mentioned in this paper:
Angola: Benguela, Humpata.
Ethiopia: Endessa, Kebre-Mengist, Uarandab.
Rhodesia/Zambia: Zambesi.
South Africa: Johannesburg, Lydenburg.

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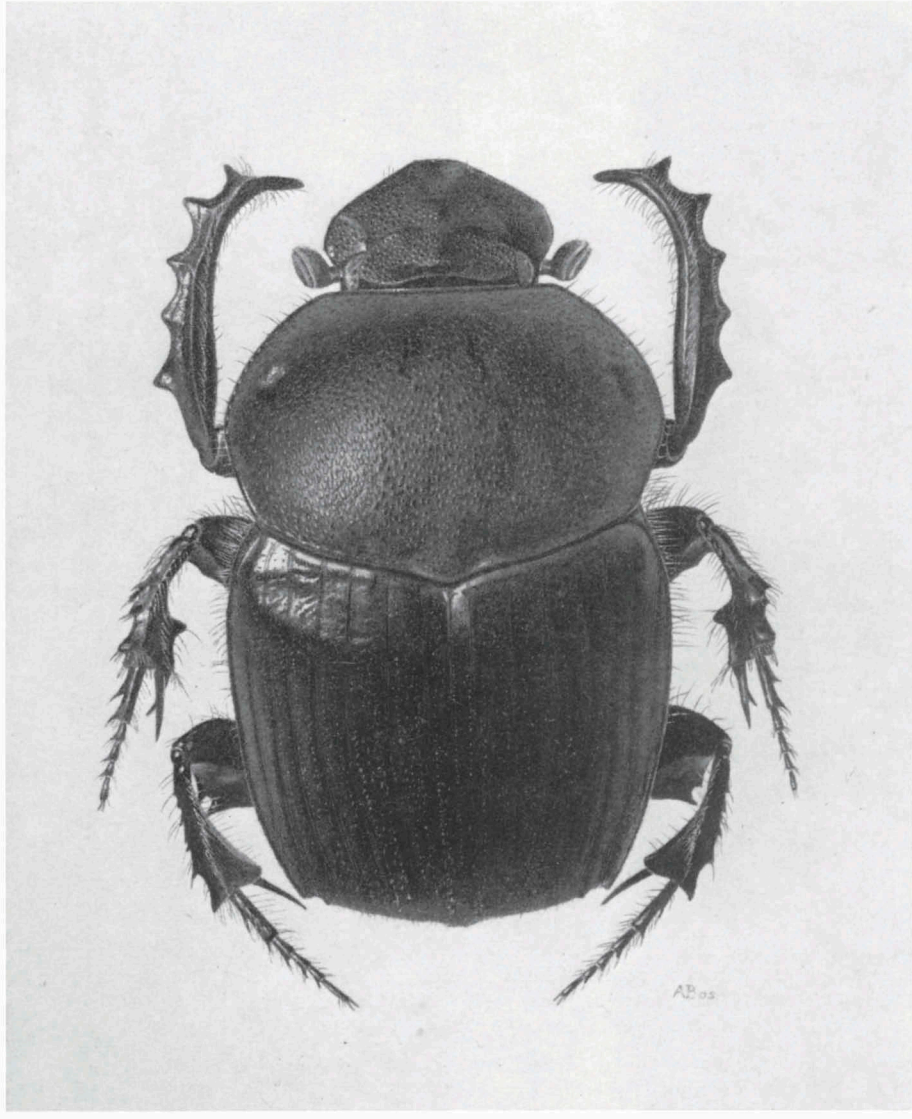
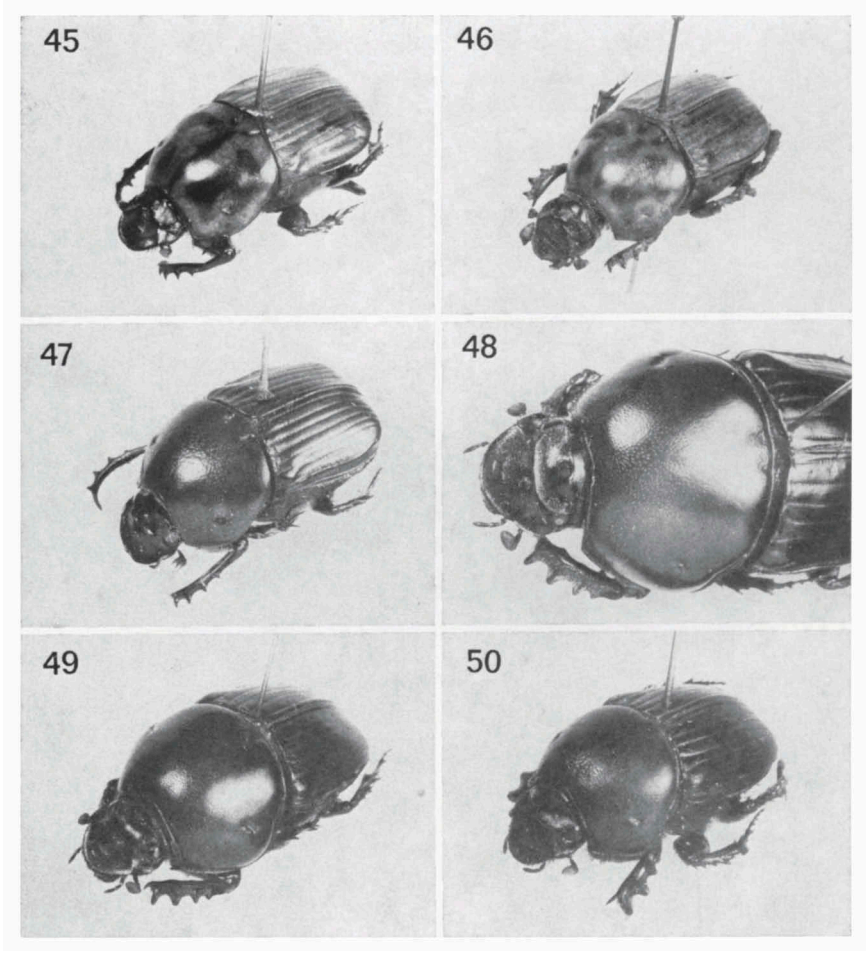
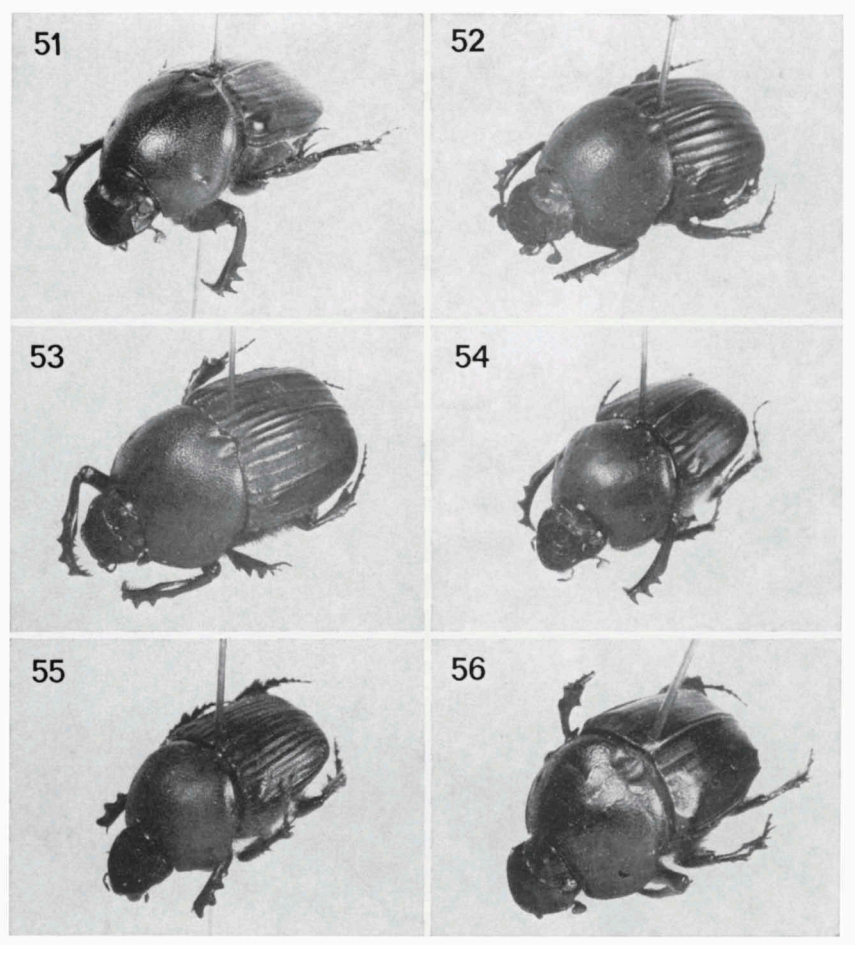


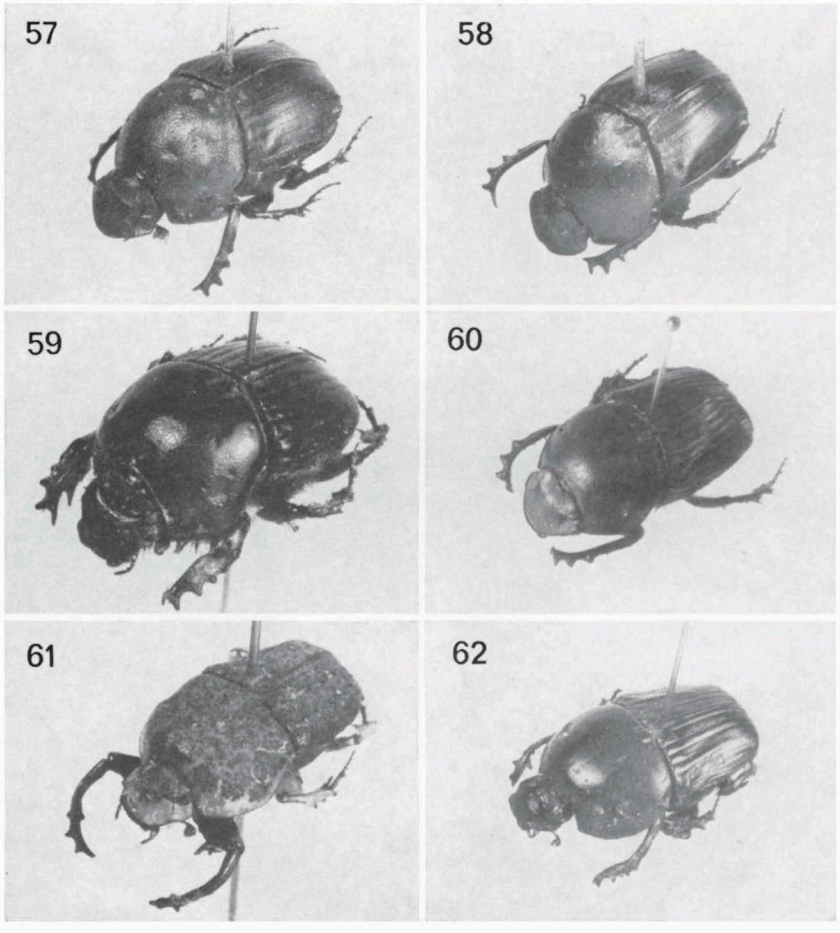
Onitis fulmineus Janssens — a characteristic onitine scarab of Tsavo National Park; ♂ Voi Mzinga, total length 18 mm.



Figs. 45-50. *Onitis* species. — 45, ***bispicticollis***, ♂ holotype, length 22 mm, ♀ paratype Longalonga, 20 mm; 47, ***vanderkelleni***, ♂ lectotype, 21 mm; 48-49, ***thoracicus***, ♂ W of Aruba, 26 mm, 50, ♀ Dida Harea, 21 mm.



Figs. 51-56. *Onitis* species. — 51, *fabricii* (♂ lectotype of *vethi*), 21.5 mm; 52, *parvulus*, ♂ Chyulu Hills, 16 mm; 53, *sulcipennis naromorus*, ♂ holotype, 17.5 mm; 54, *trochantericus*, ♂ Voi Mzinga, 14.5 mm, 55, ♀ ditto, 12.5 mm; 56, *kingstoni*, ♂ holotype, 16 mm.



Figs. 57-62. *Onitis, Cheironitis* and *Aptychonitis* species. — 57, *O. obscurus*, ♂ lectotype, 15 mm; 58, *O. westermanni*, ♂ lectotype, 14 mm; 59, *O. laminosus*, ♂ Seronera, 20 mm; 60, *O. pseudojansenii*, ♂ holotype, 24 mm; 61, *Cheironitis* near *imitator*, ♂ ENE of Voi, 14.5 mm; 62, *Aptychonitis anomalus*, ♂ Ndara, 18 mm.