

A revision of the southern African genus  
*Epirinus* Reiche  
(Coleoptera: Scarabaeidae: Scarabaeinae)

by

C. H. SCHOLTZ

Department of Entomology, University of Pretoria, Pretoria 0002

and

H. F. HOWDEN

Department of Biology, Carleton University, Ottawa K1S 5B6, Canada

*Epirinus* is systematically revised. The genus, which is restricted to southern Africa, comprises 23 species of which 11 are new. The new species are *E. convexus*, *E. davisi*, *E. drakomontanus*, *E. granulatus*, *E. montanus*, *E. microdentatus*, *E. punctatus*, *E. pygidialis*, *E. relictus*, *E. rugosus* and *E. striatus*. Two names are synonymized and two lectotypes designated. A key is provided to the species. Each species is illustrated and its distribution mapped.

## INTRODUCTION

This revision of *Epirinus* Reiche forms part of a larger study of the African Canthonina (Scarabaeini) by the authors.

*Epirinus* has not been systematically treated before, the only study in which the species were treated as a group being Ferreira (1964). The known species were keyed in that paper but discussed no further. Since Ferreira's study a considerable amount of material has accumulated in various collections and consequently it was considered worthwhile to revise the genus.

Very little is known of the biology of *Epirinus* but species are attracted to herbivore dung or carrion (some species are attracted to both). The larger species roll balls in typical scarabaeine fashion and some of the smaller species have been collected in leaf litter where it is assumed they feed on dung of small vertebrates. It is not known what larval food is and it would be particularly interesting to determine this in a species with omnivorous adults.

Institutions in which studied material and types are deposited are abbreviated as follows below; curators responsible for the collections are listed with the address of each institution.

- BMNH – British Museum (Natural History), London: M. E. Bacchus, L. Jessop  
 DRU – Dung Beetle Research Unit, CSIRO, Pretoria: B. Doube  
 H&AH – Howden Collection, Carleton University, Ottawa: H. F. Howden  
 IRSN – Institut Royal des Sciences Naturelles de Belgique, Brussels: J. Decelle  
 MNHN – Museum National d'Histoire Naturelle, Paris: Y. Cambefort  
 NCI – National Collection of Insects, Plant Protection Research Institute, Pretoria: R. G. Oberprieler  
 NMB – National Museum, Bloemfontein: S. Louw  
 NRS – Naturhistoriska Riksmuseet, Stockholm: Per Inge Persson  
 SAM – South African Museum, Cape Town: V. B. Whitehead  
 SM – State Museum, Windhoek: J. Irish  
 SMTD – Staatliches Museum für Tierkunde, Dresden: R. Krause  
 TM – Transvaal Museum, Pretoria: S. Endrödy-Younga  
 ZMHB – Zoologisches Museum, Berlin: M. Uhlig

### Genus *Epirinus* Reiche

**Epirinus** Reiche, 1841: 212; Lacordaire 1856: 81; Péringuey 1901: 89; Gillet 1911: 03; Ferreira 1964: 3; Ferreira 1969: 136

Type-species: *Scarabaeus flagellatus* Fabricius, by subsequent designation, Janssens, 1938.

**Endroedyantus** Cambefort, 1978: 201; Scholtz & Howden, in press (this issue)

*Colour.* Mostly dull black but also bronze, metallic green or bicolorous black and green.

*Length.* 3,0–13,5 mm.

*Head.* Clypeus basically bidentate, teeth barely protruding to large, pointed or rounded; median indentation deep to barely indented; lateral indentation of clypeo-genal suture barely visible to distinct; surface densely punctate.

*Pronotum.* Surface sparsely to densely punctate, with or without setae; median longitudinal line visible or obsolete, or foveae present; lateral margin evenly rounded to oblique for anterior one-third; anterior angle round to slightly pointed.

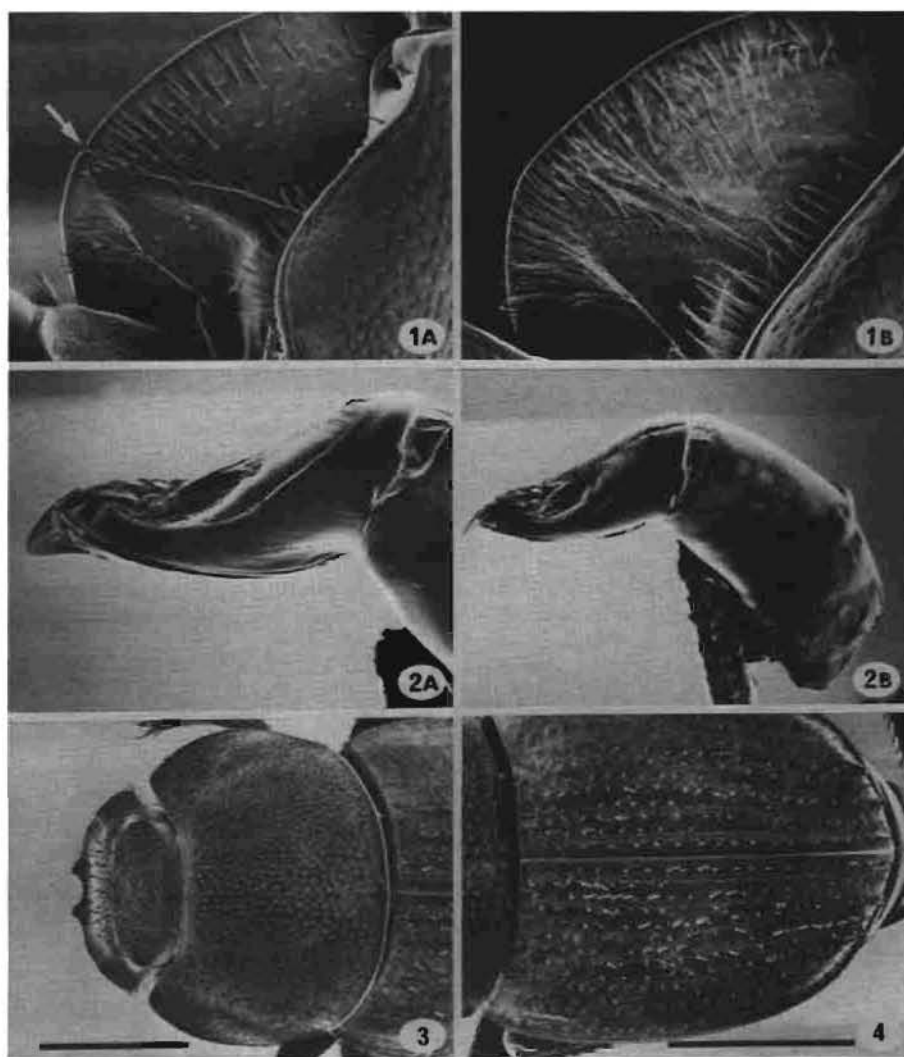
*Elytra.* Humeral umbone present or absent, when present usually small but distinct; striae very pronounced to barely visible and may be distinctly and deeply punctured to barely so; interstriae variable from flat without sculpture to tectiform with large granules, or setose; dorsal margin of epipleura from narrow to wide; apical callosity barely raised to large; episternal sides glabrous to striate, setose or granulate or in combination.

*Venter.* Metasternum and abdominal sternites sparsely to densely punctate, with or without setae; pygidium punctate, setose, granulate or in combination, or distinctly tuberculate or costate; episternal carina either clearly reaches anterior pronotal margin (Fig. 1a) or ends just short of margin (Fig. 1b).

*Legs.* Metatibiae dimorphic to similar in the sexes with degree of crenulation on the inner surface and curvature varying.

*Genitalia.* Asymmetrical (Fig. 2) but similar in all species.

**DISTRIBUTION.** All species occur south of 23 °S in southern Africa.



Figs 1-4. 1a, *Epirinus aeneus* Wiedemann, pronotum in ventral view illustrating episternal carina reaching pronotal margin; 1b, *Epirinus flagellatus* F., pronotum in ventral view illustrating episternal carina which does not reach pronotal margin; 2a-b, *Epirinus asper* Péringuey, aedeagus; a, apex of aedeagus; b, whole aedeagus, illustrating typical *Epirinus* genitalia; 3-4, *Epirinus punctatus* sp. nov.; head and pronotum; 4, elytron. Scale bar = 1 mm.

CHARACTERS OF THE SPECIES OF *EPIRINUS*

**Colour.** Most species are dull black but some (e.g. *E. gratus*, *E. montanus*) are brown and *E. aeneus* is variably metallic green, black or black and green in various combinations.

**Length.** Species vary in length from 3,0 mm (*E. hilaris*) to 13,5 mm (*E. validus*).

**Head.** All species have the clypeus basically bidentate but the teeth vary from small and barely raised with a slight median indentation (*E. striatus*) to large and closely approximated (*E. asper*) or sharp pointed with deep median and lateral indentation (*E. mucrodentatus*). The lateral indentation of the clypeo-genal suture is distinct in about half the species and faint in the rest. The dorsal surface of the head is densely punctate in all species and variably setose in some. The basal angle of the head varies between slightly subacute to slightly obtuse.

**Pronotum.** Punctuation on the dorsal surface of the pronotum varies between sparsely punctate with the diameter of the punctures considerably less than the distance between them (*E. aeneus*), to densely punctate with the diameter greater than the distance between them (most species). The surface may be sparsely setose or without setae. The lateral margin may be evenly rounded, oblique for the anterior one-third, or considerably broader at anterior than at posterior (*E. mucrodentatus*). A dark median longitudinal line is present in some species (e.g. *E. flagellatus*) or it is obsolete (various species) or replaced by median (and lateral) foveae (*E. relictus*). The anterior angle may be rounded or in the species with a very prominent episternal carina (e.g. *E. validus*), may have a lateral indentation where the carina breaks the anterior pronotal margin.

**Elytra.** The humeral umbone is visible in most species but is usually small. The presence or absence of the umbone may be used to separate the species into two distinct groups, those without a visible umbone being treated previously as a separate genus (*Endroedyantus*). Striae may be deep and very distinct (*E. striatus*) with distinct, large punctures (*E. comosus*) or barely visible (*E. validus*). Interstriae vary considerably from flat with practically no sculpture (*E. mucrodentatus*) to tectiform with large granules (*E. asper*), in *E. asper* the seventh interstria is distinctly raised and in *E. rugosus* the third and fifth are slightly raised. The lateral margin varies from narrow (narrower than eighth interstria and not to be confused with the latter) e.g. *E. silvestris*, *E. aeneus*, to wide (as wide or wider than eighth interstria) e.g. *E. rugosus*. The apical callosity may be barely raised as in several species or large (*E. rugosus*). The episternal sides may vary from glabrous to striate, granulose or setose or combinations thereof.

**Venter.** The metasternum varies from virtually glabrous to densely punctate, with or without setae. Abdominal sternites may be with only a single row of large punctures (these are glandular secretory pores), often with a seta adjacent to each (*E. granulatus*), punctate only on the anterior half of each sternite (e.g. *E. striatus*, *E. scrobiculatus*) or densely punctate over the whole surface of each sternite (e.g. *E. obtusus*). The pygidium may be punctate, setose, granular or in combination of these (various species) or distinctly tuberculate or costate (*E. relictus*). The episternal carina actually cuts the edge of the anterior pronotal margin or stops just short of the margin. This character may be used to separate the species into two distinct groups.

**Legs.** There are no characters on the legs which are useful for separating species but some species (e.g. *E. validus*) have the inner surface of the metatibiae more crenulate in males than they are in females.

**Genitalia.** The aedeagus is asymmetrical with the right paramere longer than the left and curved across the latter in all species with the result that genitalia are of practically no use in species identification.

**DISTRIBUTION.** The genus has a predominantly relict faunal distribution along the eastern escarpment of southern Africa, down the mountains and temperate forests of the southern Cape to the south-western Cape and Namaqualand. Only *E. aeneus* and *E. gratus* have a predominantly central distribution.

### Species groups

The species of *Epirinus* may be grouped into two groups on the basis of the presence or absence of a humeral umbone or the presence or absence of an episternal carina reaching the anterior pronotal margin. The absence of an umbone is probably a convergent character and doubtfully synapomorphic. The presence or absence of a complete episternal carina is probably of phylogenetic significance.

#### Key to the species of *Epirinus*

- |         |  |                               |
|---------|--|-------------------------------|
| 1       | Humeral umbone present .....   | 2                             |
| —       | Humeral umbone absent .....  | 19                            |
| 2 (1)   | Pygidium tuberculate or costate .....  | 3                             |
| —       | Pygidium without tubercles or costae .....   | 4                             |
| 3 (2)   | Length less than 5 mm .....  | <i>punctatus</i> sp. nov.     |
| —       | Length greater than 6 mm .....   | <i>relictus</i> sp. nov.      |
| 4 (2)   | Episternal carina reaching anterior margin of pronotum .....   | 5                             |
| —       | Episternal carina not quite reaching anterior margin of pronotum .....   | 12                            |
| 5 (4)   | Apex of anterior angle of pronotum with slight lateral indentation .....   | 6                             |
| —       | Apex of anterior angle of pronotum without indentation .....   | 9                             |
| 6 (5)   | Length less than 8 mm; distributed west of 22°E .....  | 7                             |
| —       | Length greater than 8 mm; distributed east of 22°E .....   | 8                             |
| 7 (6)   | Abdominal sternites densely punctured; elytral striae parallel-sided; elytral interstriae with distinct rows of regularly-spaced granules; specimens black .....   | <i>bentoi</i> Ferreira        |
| —       | Abdominal sternites sparsely punctured; elytral striae with punctures broader than rest of stria; elytral interstriae with very small, irregularly-spaced granules; specimens often green or partly so ..... | <i>aeneus</i> (Wiedemann)     |
| 8 (6)   | Elytral interstriae tectiform, with deep punctures and irregularly-arranged granules; distributed south of 30°S, usually smaller than 12 mm .....  | <i>sulcipennis</i> Boheman    |
| —       | Elytral interstriae flat, with up to four rows of regular granules; distributed north of 30°S, usually larger than 12 mm .....   | <i>validus</i> Péringuey      |
| 9 (5)   | Length of elytra more than twice length of pronotum; specimens brown, often with curved pronotal and elytral setae .....   | <i>gratus</i> Péringuey       |
| —       | Length of elytra not more than twice pronotal length .....   | 10                            |
| 10 (9)  | Striae with distinct, deep punctures; interstitial surface tectiform, punctate, with widely-spaced granules .....  | 11                            |
| —       | Striae without distinct punctures; interstitial surface flat, without punctures, granules close together .....   | <i>granulatus</i> sp. nov.    |
| 11 (10) | Strial margins distinct; interstriae with long, curved setae .....   | <i>comosus</i> Péringuey      |
| —       | Strial margins fused; interstriae with short setae at most .....   | <i>drakomontanus</i> sp. nov. |
| 12 (4)  | Elytral interstriae with large, round, shiny protuberances .....   | <i>flagellatus</i> Fabricius  |
| —       | Elytral interstriae with granules, at most .....   | 13                            |
| 13 (12) | Seventh interstria distinctly raised, with larger granules .....   | <i>asper</i> Péringuey        |
| —       | Seventh interstria not distinctly raised, not with larger granules .....   | 14                            |
| 14 (13) | Elytral interstriae with distinct granules .....   | 15                            |
| —       | Elytral interstriae without raised granules, at most with very small, shiny spots .....  | <i>microdentatus</i> sp. nov. |
| 15 (14) | Third and fifth elytral interstriae elevated .....   | <i>rigosus</i> sp. nov.       |
| —       | All elytral interstriae the same .....   | 16                            |

- 16 (15) Strial punctures considerably wider than the rest of the stria ..... *pygidialis* sp. nov.  
 — Strial punctures barely wider than the rest of the stria ..... 17
- 17 (16) Clypeus with pointed teeth; pygidium without punctures ..... *scrobiculatus* Harold  
 — Clypeus with rounded teeth; pygidium punctate ..... 18
- 18 (17) Abdominal sternites with large punctures on anterior half ..... *striatus* sp. nov.  
 — Abdominal sternites with small punctures over most of surface ..... *obtusus* Boheman
- 19 (1) Pygidium with distinct tubercles or costa ..... 20  
 — Pygidium without distinct tubercles or costa; epipleural margins distinctly raised .....  
 ..... *silvestris* Cambefort
- 20 (19) Pronotum with distinct foveae; metasternum very sparsely punctate. .... *davisi* sp. nov.  
 — Pronotum without foveae; metasternum distinctly punctate ..... 21
- 21 (20) Punctures on pronotal surface with diameter less than distance between them;  
 usually larger than 5 mm ..... *montanus* sp. nov.  
 — Punctures on pronotal surface with diameter as large or greater than distance be-  
 tween them; usually smaller than 5 mm ..... 22
- 22 (21) Epipleura convex; densely setose, setae broad, with sharp recurved point; meta-  
 sternal punctures with diameter approximately equal to distance between them .....  
 ..... *convexus* sp. nov.  
 — Epipleura concave; sparsely setose, setae narrow; metasternal punctures with  
 diameter less than distance between them ..... *hilaris* Péringuey

***Espirinus punctatus* sp. nov., Figs 3, 4, 49**

**HOLOTYPE.** Size. Length 4.5 mm, pronotal width 2.5 mm, elytral width 2.5 mm, ratio of length of pronotum : elytra 3 : 5.

**Head.** Clypeus bidentate, teeth prominent with distinct median indentation, lateral indentation of clypeo-genal suture distinct; surface densely punctate with sparse long thin setae (Fig. 3); basal angle obtuse.

**Pronotum.** Surface densely punctate, setose (Fig. 3); disc with distinct medio-basal foveae and submedian lateral foveae; lateral margin rounded; anterior angle slightly pointed.

**Elytra.** Humeral umbone visible; striae distinct (Fig. 4), punctures large, circular and virtually touching; interstriae without sculpture but with flat, broad setae which attenuate to a sharp point; third and fifth interstriae with large, pointed apical tubercles; margin wide.

**Venter.** Episternal carina reaching anterior angle of pronotum; metasternum glabrous; abdominal sternites with median row of large punctures, each with an adjacent seta; pygidium with raised median costa.

**MATERIAL EXAMINED.** Holotype. S. Afr. Drakensberg, Cathedral Peak 28.57 S-29.12 E, 10.11.1976: E-Y: 1286, groundtraps, leg. C. Scholtz (TM). Paratypes. S. Afr. Natal, Cathedral Peak, 28.57 S-29.12 E, 13.3.1976; E-Y; 1075, groundtraps seven days, Endrödy & Breytenb. (TM); Natal, Drakensberg, Ogalweni Forest, humus, X.1960 (TM); Rep. South Africa; Natal, 75 km WSW Estcourt, Cathedral Peaks For. Sta., 7-31.xii.79, S. & J. Peck, Rainbow Gorge Podocarp Forest, 1500 m, minidung cup traps, 16.xii.1979 (1 H & AH, 1 BMNH); same data except date, 11-12.xii.79 (1 H & AH, 1 MNHN); same data except Riverside Scrub, malaise trough, 7-20.xii.79 (1 H & AH).

**ETYMOLOGY.** The name *punctatus* is derived from the distinctive punctuation of the elytral striae.

**REMARKS.** Length varies from 3,5–4,5 mm, pronotal width from 2,0–2,5 mm and elytral width from 2,0–2,5 mm. The size of the apical elytral tubercles varies somewhat, those of the holotype being larger than those of the paratypes. This new species is most similar to *E. relictus* with which it shares the distinctive pygidial tubercles and pronotal foveae but can be distinguished from the latter by size; *E. punctatus* is smaller than 5,0 mm and *E. relictus* larger than 6,0 mm. *Epirinus punctatus* is known only from the type locality (Fig. 49).

***Epirinus relictus* sp. nov.**, Figs 5, 6, 50

**HOLOTYPE.** Size. Length 8,5 mm, pronotal width 5,0 mm, elytral width 5,0 mm, ratio of length of pronotum : elytra 3 : 5.

**Head.** Clypeus bidentate, with small, slightly pointed teeth, widely separated, with a distinct median indentation; lateral indentation of clypeo-genal suture obsolete; surface sparsely punctured, with sparse setae (Fig. 5); basal angle acute.

**Pronotum.** Surface sparsely punctate, punctures with dark centre and paler ring around (Fig. 5); with sparse setae; disc with distinct foveae, the largest being two along median axis, one basal and one anterior and one submedially on either side; lateral margin oblique for anterior one-third; anterior angle slightly pointed.

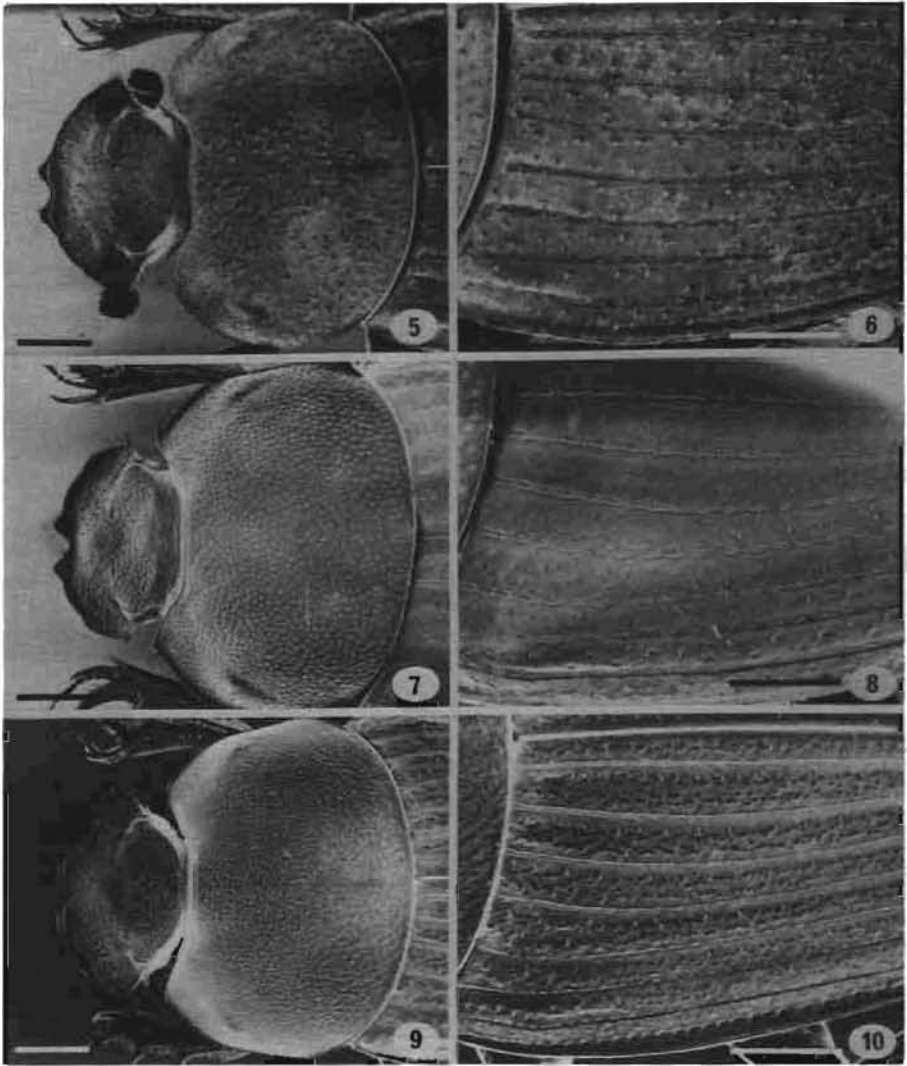
**Elytra.** Humeral umbone barely raised; striae distinct, punctate and with thickened margins; alternate interstriae distinctly raised, each with two rows of curved fulvous setae (Fig. 6); margin wide; apical callosity large.

**Venter.** Episternal carina reaching anterior margin of pronotum. Metasternum shiny, sparsely punctured, with isolated setae; abdominal sternites punctured on anterior half, slightly raised medially; sternites with distinct lateral depressions between; pygidium with two raised, elongate tubercles.

**MATERIAL EXAMINED.** Holotype. S. Afr. Drakensberg, Cathedral Peak 28.57 S–29.12 E, 10.11.1976; E-Y : 1286, groundtraps, leg. C. Scholtz (TM). Paratypes. Same data as holotype (3 TM); S. Afr. Natal, Cathedral Peak 28.57 S–29.12 E, 13.3.1976; E-Y : 1075, groundtraps 7 days, Endrödy & Breytenb. (1 TM); 75 km WSW Estcourt, Cathedral Peaks For. Stn. xii.79, S. & J. Peck (1 BMNH, 1 MNHN, 1 NCI, 7 H & AH); S. Afr. S. Cape, Tsitsikama, Lotter 33.56 S–23.40 E, 15.12.1977; E-Y : 1424, dung collection, leg. Endrödy-Younga (2 TM, 1 H & AH); S. Afr. Swartberge, Blesberg-W, 1850 m 33.24 S–22.40 E, 7.11.1978; E-Y : 1514, groundtraps, 40 days, leg. Endrödy-Younga (7 TM); Drakensberg, Natal, (Cathedral Peak), 25.iii.76, G. Tribe (1 DRU); same data except collected 1.iii.76, 2070 m ( MNHN); Drakensberg, Natal (Cathedral Peak–Tseke–Tseke Valley) 24.iii.76, G. Tribe (1 BMNH); without data (12 MHB).

**ETYMOLOGY.** The name *relictus* is derived from the nature of the species' distribution.

**REMARKS.** In spite of the fact that this new species has widely disjunct distribution in relict forests of the Natal Drakensberg and southern Cape Province (Fig. 50) there is little morphological variation within the species. Length varies from 7,0–8,5 mm, pronotal width from 4,0–5,0 mm and elytral width from 4,2–5,0 mm. This species is most similar to *E. punctatus* from which it can easily be distinguished by size (see above).



Figs 5-10. 5-6, *Epirinus relictus* sp. nov.; 5, head and pronotum; 6, elytron; 7-8, *Epirinus aeneus* Wiedemann; 7, head and pronotum; 8, elytron; 9-10, *Epirinus bentoi* Ferreira; 9, head and pronotum; 10, elytron. Scale bar = 1 mm.



*Epirinus aeneus* (Wiedemann), Figs 7, 8, 49**Scarabaeus aeneus** Wiedemann, 1823: 24**Epirinus aeneus** Péringuey 1901: 93**Epirinus deplanatus** Boheman, 1858: 41; Péringuey 1901: 93

*Size.* Length 4.5–7.2 mm, pronotal width 3.0–4.5, elytral width 3.5–5.5 mm, ratio of length of pronotum: elytra 1:2.

*Head.* Clypeus bidentate, teeth large, blunt, close together; lateral indentation of clypeo-genal suture distinct; surface of clypeus densely punctate, that of frons sparsely punctate (Fig. 7); basal angle rounded.

*Pronotum.* Surface sparsely punctate (Fig. 7); lateral margin with anterior one-third oblique and anterior angle slightly pointed; median and medio-lateral foveae present.

*Elytra.* Humeral umbone distinct; striae distinct, with thickened margins and punctures (Fig. 8); interstriae with small antero-median tubercle, surface with very small, distinct punctures, margin narrow, apical callosity distinct.

*Venter.* Episternal carina reaches anterior pronotal margin metasternum sparsely punctured; abdominal sternites with single anterior row of setose punctures; pygidium sparsely setose.

**MATERIAL EXAMINED.** CAPE. Arniston, 34.39 S 20.13 E, 29.8.1983, 7. Endrödy & Penrith (1 TM); Bontebok N.P., 21.10.1971, Bornemissza & Kirk (6 DRU); Brackfontein Farm, 32.56 S 18.15 E, 23.8.1983, Endrödy & Penrith (1 TM); Bredasdorp, 20.10.1971, Bornemissza & Kirk (2 DRU); Britstown (33 km N), 13.9.1973, Davis & Temby (29 DRU); Calvinia (52 km NE), 26.4.1976, Davis & Aschenborn (3 DRU); Carnarvon (26 km W), 14.9.1973, Davis & Temby (18 DRU); Elandsbay Forest, 32.18 S 18.21 E, 28.8.1981, Endrödy-Younga (3 TM); Geelbek, 21.10.1975, H. H. Aschenborn (1 DRU); Gouda, 7.11.1979, Davis & Payton (3 DRU); Hopefield (22 km NW), 20.10.1975, H. H. Aschenborn (1 DRU); Hopetown (58 km NE), 5.10.1974, Houston, Davis, Tribe (5 DRU); Jonkis Poort, 32.29 S 19.27 E, 2.9.1981, Endrödy-Younga (3 TM); Kamieskroon (12 km N), 16.9.1973, Davis & Temby (1 DRU); Klippe Rugt Farm, 34.42 S 20.12 E, 28.10.1983, Endrödy-Younga (2 TM); Koekenaap, 31.32 S 18.14 E, 31.8.1979, Endrödy-Younga (1 TM); Kotzesrus, 30.57 S 17.50 E, 23.8.1979, Endrödy-Younga (1 TM); Kruidfontein (Beaufort West area), 15.10.1971, Bornemissza & Kirk (12 DRU); Lamberts Bay, 32.04 S 18.19 E, 25.8.1981, Endrödy-Younga (4 TM); Lamberts Bay (9 km N), 28.9.1974, Houston, Davis, Tribe (10 DRU); Langebaan (12 km SE – Geelbek), 8–29.10.1979, Davis & Payton (1 DRU); Leipoldtville (6 km SW), 27.4.1976, Davis & Aschenborn (6 DRU); Malmesbury, 17.10.1971, Bornemissza & Kirk (3 DRU); Mosselbay, 21.10.1971, Bornemissza & Kirk (1 DRU); Napier (14 km NW), 24.11.1975, H.H. Aschenborn (3 DRU); Nortier Farm, 32.03 S 18.19 E, 25.8.1981, Endrödy-Younga (10 TM); Olifantshoek (54 km SW), 19.9.1973, Davis & Temby (8 DRU); Papendorp, 31.38 S 18.12 E, 22.8.1981, Endrödy-Younga (16 TM); Piketberg (33 km W), 28.4.1976, Davis & Aschenborn (1 DRU); Pofadder (44 km N), 28.50 S 19.20 E, 2.10.1976, Endrödy & Breytenbach (2 TM); Sauer (23 km W), 20.10.1975, H. H. Aschenborn (7 DRU); Seweputs Coast, 31.39 S 18.17 E, 28.8.1981, Endrödy-Younga (10 TM); Springbok (23 km SW), 26.9.1974, Houston, Davis, Tribe (1 DRU); Upington (47 km NE), 25.4.1976, Davis & Aschenborn (3 DRU); Van Ruyn's Pass, 27.9.1974, Houston, Davis, Tribe (5 DRU); Velddrif (15 km SW), 15.9.1973, Davis & Temby (3 DRU); Vosburg (15 km E),

13.9.1973, Davis & Temby (6 DRU); Vredenburg (10 km NE), 20.10.1975, H. H. Aschenborn (1 DRU); Vredendal (7 km S), 26.4.1976, Davis & Aschenborn (9 DRU); Zwartskraal Farm, 33.10 S 22.32 E, 30.4.1979, R. Oosthuizen (11 TM). No data. 46 (DRU), 6 (SMTD), 4 (SAM), 5 (ZMHB), 4 (IRSN).

**REMARKS.** *Epirinus aeneus* is a variable green to black metallic species which is easily identified by the punctation on the pronotum. The punctures are small and widely separated whereas in all other species they are larger or closely approximated. Members of the coastal populations are predominantly green or black with green legs whereas members of the inland populations appear predominantly black.

The type could not be traced.

**DISTRIBUTION** Widespread in southern Namaqualand, southwestern Cape Province and southern Kalahari (Fig. 49).

*Epirinus bento* Ferreira, Fig 9, 10, 50

***Epirinus bento* Ferreira, 1964:6**

**Size.** Length 6,5–7,5 mm, pronotal width 4,5–5,2 mm, elytral width 4,5–5,2 mm, ratio of length of pronotum: elytra 3:4.

**Head.** Clypeus without prominent teeth but with a distinct, wide median indentation; lateral indentation of clypeo-genal suture faint; basal angle acute; dorsal surface finely rugose, without distinct punctures (Fig. 9).

**Pronotum.** Surface finely rugose without distinct punctures but with very small, sparse granules (Fig. 9); median longitudinal line faint, lateral margin rounded or oblique for anterior one-third; anterior angle pointed.

**Elytra.** Humeral umbone distinct; striae distinct, parallel-sided with thickened margins (Fig. 10); interstriae slightly raised, with distinct rows of shiny granules; margin wide; apical callosity large.

**Venter.** Episternal carina reaches anterior margin of pronotum; metasternum with faint longitudinal depression, punctate; abdominal sternites densely punctured on anterior half; pygidium with sparse setae.

**MATERIAL EXAMINED.** CAPE. Lamberts Bay (9 km N), 28.ix.1974, Houston, Davis, Tribe (1 H & AH). No data. 3 (DRU).

**REMARKS.** Few specimens of this species were examined and they exhibited little variation. The species is most similar to *E. aeneus* but can be distinguished from the latter by the presence of a finely rugose pronotal surface and densely punctate anterior half of each abdominal sternite; *E. aeneus* has sparsely punctured pronotal surface and abdominal sternites with a single row of setose punctures.

The types could not be traced. They are not in the SAM as claimed by Ferreira (1964) and are thought not to have been returned after that study.

**DISTRIBUTION.** Southwestern Cape Province (Fig. 50).

*Epirinus sulcipennis* Boheman, Figs 11, 12, 51

***Epirinus sulcipennis* Boheman, 1857:198; Péringuey 1901:90**

**Size.** Length 9,0–11,5 mm, pronotal width 6,0–7,5 mm, elytral width 6,2–8,0 mm, ratio of length of pronotum to elytra 1:2.

*Head.* Clypeus bidentate, with broad, rounded, widely separated teeth; median indentation deep; lateral indentation of clypeo-genal suture distinct; surface densely punctate with small punctures (Fig. 11); basal angle obtuse.

*Pronotum.* Surface densely punctate, with small punctures (Fig. 11); median longitudinal line faint; lateral margin rounded, anterior angle slightly pointed, with slight subapical indentation.

*Elytra.* Humeral umbone distinct; striae faint; interstriae with distinct small antero-median tubercles (Fig. 12); interstitial surface raised medially (tectiform) with very small, irregularly spaced granules and distinct punctures; margin wide; apical callosity barely raised.

*Venter.* Episternal carina reaches anterior pronotal margin; metasternum and abdominal sternites finely punctate; pygidium with very small granules.

*Legs.* Males have inner surface of metatibiae distinctly crenulate, much less so in females.

**MATERIAL EXAMINED.** Lectotype (new designation) Cap. B. Spei (NRS).

CAPE. Albany (2 SMTD); Bedford (4 SMTD); Grootberg, 33.55 S–20.51 E, 7.12.1978, leg. Endrödy-Younga (4 TM); Knysna (1 SAM); Queenstown (50 mi N), 13.5.1971, H. H. Aschenborn (5 DRU); Smithfield, O. E. C. Kannemeyer (1 SAM). No data. 3 (SAM), 2 (ZMHB).

**REMARKS.** There is very little variation in the few specimens examined. *Epirinus sulcipennis* is most similar to *E. validus* but can be distinguished from the latter by the tectiform elytral interstriae with a few irregularly spaced granules; *E. validus* has flat interstriae and numerous small granules.

**DISTRIBUTION.** Southern and south-eastern Cape Province (Fig. 51).

*Epirinus validus* Péringuey, Figs 13, 14, 51

***Epirinus validus*** Péringuey, 1901: 91.

*Size.* Length 10.0–13.5 mm, pronotal width 7.0–8.5 mm, elytral width 7.5–9.0 mm, ratio of length of pronotum : elytra 5 : 8.

*Head.* Clypeus bidentate, teeth blunt, widely spaced; lateral indentation of clypeo-genal suture faint; basal angle acute; dorsal surface densely punctate (Fig. 13).

*Pronotum.* Surface densely punctate (Fig. 13) with faint median longitudinal line; lateral margin with anterior one-third oblique and anterior angle slightly pointed, with slight subapical indentation.

*Elytra.* Humeral umbone distinct; striae barely visible, with shallow punctures (Fig. 14); interstriae with distinct antero-median tubercle and regularly spaced, small, shiny granules; apical callosity distinct; margin narrow at base and apex, slightly wider at middle.

*Venter.* Episternal carina reaches anterior pronotal margin; metasternum punctate; abdominal sternites with anterior half punctate; pygidium sparsely granulate.

*Legs.* Males have inner surface of metatibia distinctly crenulate, much less so in females.

**MATERIAL EXAMINED.** NATAL. Cathedral Peak, 28.57 S 29.12 E, 10.11.1976, C. Scholtz (2 TM); Cathedral Peak, 28.57 S 29.12 E, 15.3.1976, Endrödy-Younga (39 TM); Cathedral Peak, 25.3.1976, G. Tribe (3 DRU); Cathedral Peak, 75 km WSW Estcourt, 7-13.12.1979, S. & J. Peck (67 H & AH); Royal Natal N.P., 11.11.1979, L. Schultze (1 TM). TRANSVAAL. Blyde River Canyon, 24.15 S 30.50 E, 25.10.1976, C. Scholtz (8 TM). Lothair, 29.5.1971, H. H. Aschenborn (1 DRU); Piet Retief (7 mi SW), 2.4.1972, A. A. Kirk (1 DRU). No data. 6 (SAM), 7 (ZMBH), 1 (IRSN).

**REMARKS.** This dull black species varies somewhat in size but is characterized by the generally large size (it is the largest species in the genus) and the flat elytral interstriae with small granules. It is most similar to *E. sulcipennis* Boheman but besides the differences mentioned under that species above, the two species are widely separated geographically.

The type series was described from Lydenburg but no specimens of this series could be traced in the Péringuey collection. A specimen labelled 'allotype' by Ferreira and given a type number recently at the SAM (2665) cannot be from the type series as it is from a different locality and is a female. Péringuey saw only males. Furthermore the specimen bears a determination label in Andrea's (a later curator at the SAM) handwriting. Another specimen, bearing a SAM type number (2666) is a specimen of *E. sulcipennis* collected at Knysna so cannot be a type. A third dissected male specimen, determined as *E. validus* by Péringuey and bearing the number 461 but no other data may be a member of the original type series but there is insufficient proof thereof to justify designating it lectotype.

**DISTRIBUTION.** High-lying areas of Natal and the Transvaal (Fig. 51).

*Epirinus gratus* Péringuey, Figs 15, 16, 51

*Epirinus gratus* Péringuey, 1901: 93.

**Size.** Length 4.7-6.5 mm, pronotal width 7.0-8.5 mm, elytral width 7.5-9.0 mm, ratio of length of pronotum : clytra 2 : 5.

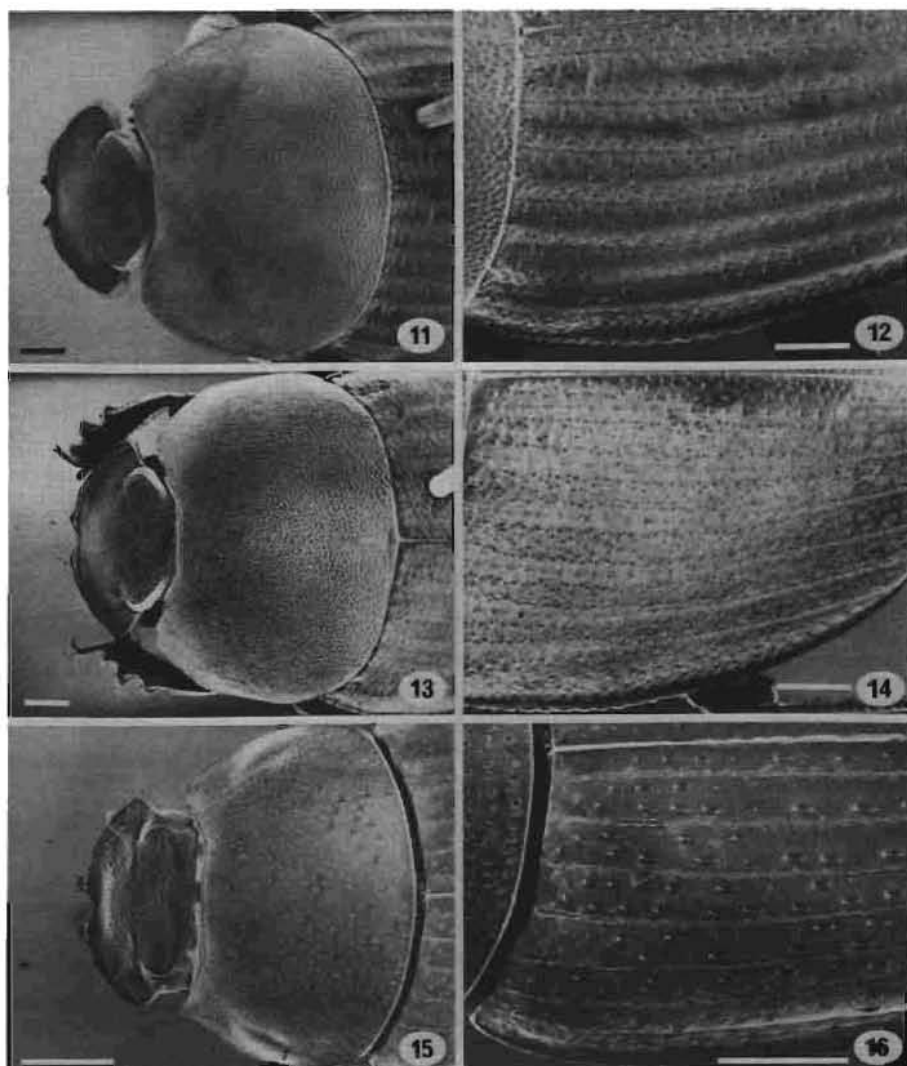
**Head.** Clypeus with prominent large teeth, broad-based and pointed, median indentation deep; lateral indentation of clypeo-genal suture barely visible; surface densely punctate (Fig. 15); basal angle obtuse.

**Pronotum.** Surface sparsely punctate, with long curved setae (Fig. 15); slight median depression present; lateral margin rounded; anterior angle pointed.

**Elytra.** Humeral umbone distinct; striae distinct, parallel-sided, with thickened margins (Fig. 16); interstriae with long, curved, flavescent setae; margin wide; apical callosity distinct.

**Venter.** Episternal carina reaches anterior pronotal margin; metasternum glabrous; abdominal sternites without sculpture but with a single median row of fulvous setae; pygidium without sculpture but with sparse setae.

**MATERIAL EXAMINED.** CAPE. Vryburg (5 mi SE), 23.5.1972, A. L. V. Davis (3 DRU); Vryburg, Biesiesvlakte, 10.11.1961, H. A. D. van Schalkwyk (1 H & AH); Vryburg, Bourdeaux on Mistake, 22-26.2.1980, S. Louw & M. L. Penrith (120 SM). ORANGE FREE STATE. Boshof (20 km W), 12-14.12.1984, H. & A. Howden (2 H & AH); Bultfontein, Hartenbosch 43, 1-2.2.1978, A. Strydom (37 NMB); Hoopstad, Doornbult 1310, 5-9.3.1979, A. Strydom (6 NMB); Hoopstad, Sandveld N.R.,



Figs 11–16. 11–12, *Epirinus sulcipennis* Boheman; 11, head and pronotum; 12, elytron; 13–14, *Epirinus validus* Péringuey; 13, head and pronotum; 14, elytron; 15–16, *Epirinus gratus* Péringuey; 15, head and pronotum; 16, elytron. Scale bar = 1 mm.

8-12.2.1982 (23 NMB); Hoopstad, Sophiasdal 280, 7-8.2.1978, A. Strydom (1 NMB). TRANSVAAL. Schweizer Reineke (2 mi E), 23.5.1972, A. L. V. Davis (1 DRU, 1 H & AH). No data. 2 (SMTD), 5 (SAM).

REMARKS. This is a very distinctive elongate, brown, mostly setose species which is not easily confused with any other.

The type, recorded by Péringuey to be from 'Griqualand West' could not be traced. A series of specimens in the SAM, labelled and identified by Péringuey as *E. gratus*, were collected after the species was described so cannot be types. One of these specimens bears a recent red 'type' label.

DISTRIBUTION. Recorded only from the southern Kalahari (Fig. 51).

***Epirinus granulatus* sp. nov.**, Figs 17, 18, 50

HOLOTYPE. Size. Length 6.0 mm, pronotal width 3.5 mm, elytral width 4.0 mm, ratio of length of pronotum : elytra 2 : 3.

Head. Clypeus without prominent teeth but with distinct, wide median indentation; lateral indentation of clypeo-genal suture distinct; surface densely punctate (Fig. 17); basal angle obtuse.

Pronotum. Surface densely punctate, with sparse fulvous setae (Fig. 17); very faint median depression visible; lateral margin oblique for anterior one-third; anterior angle slightly pointed.

Elytra. Humeral umbone barely raised; striae distinct (Fig. 18); interstriae with numerous large, shiny granules and short, straight fulvous setae; margin narrow; apical callosity large.

Venter. Episternal carina reaches anterior pronotal margin; metasternum with widely-spaced shallow punctures and short setae; abdominal sternites slightly raised medially, with a row of setose punctures on anterior half of each sternite; sternites with distinct lateral depression between; pygidium rugose, with sparse setae.

MATERIAL EXAMINED. Holotype. S. Afr. Namaqualand, Koekenaap 31.32 S - 18.14 E, 31.8.1979; E-Y: 1624, red dunes, day, leg. Endrödy-Younga (TM). Paratypes. With same data as holotype (4 TM; 1 BMNH; 1 MNHN); S. Afr. Namaqualand, Kotzesrus 30.57 S - 17.50 E, 23.8.1979; E-Y: 1582, groundtraps 62 days, leg. Endrödy-Younga (1 TM; 1 H & AH); Seweputs Farm, 31.39 S - 17.50 E, 22.8.1981, Endrödy-Younga (3 TM).

ETYMOLOGY. The name *granulatus* is derived from the interstitial granules.

REMARKS. Members of this new species vary in length from 4.2-6.0 mm, pronotal width 3.0-3.5 mm and elytral width 3.1-3.7 mm. The lateral margin of the pronotum varies from rounded to oblique for the anterior one-third. It is most similar to *E. comosus* but can easily be distinguished from the latter by the absence of long dorsal setae and the single row of setose punctures on the abdominal sternites; *E. comosus* has long dorsal setae and abdominal sternites densely punctate in the anterior half. The species has only been recorded from Namaqualand (Fig. 50).

*Epirinus comosus* Péringuey, Figs 19, 20, 50.

***Epirinus comosus*** Péringuey, 1901: 94.

*Size.* Length 4.7–5.7 mm, pronotal width 3.2–3.7 mm, elytral width 3.2–4.0 mm, ratio of length of pronotum : elytra 1 : 2.

*Head.* Clypeus bidentate, teeth small, blunt, widely separated; lateral indentation of clypeo-genal suture faint; basal angle acute to rounded; dorsal surface densely punctate, with sparse setae (Fig. 19).

*Pronotum.* Surface densely punctate, with scattered setae (Fig. 19); slight median depression present; lateral margin with anterior one-third oblique and anterior angle pointed.

*Elytra.* Humeral umbone distinct, striae with distinct regularly spaced round punctures (Fig. 20); interstriae with small but distinct, widely spaced tubercles, occasional distinct, elongate punctures and long, curved setae, margin wide; apical callosity large.

*Venter.* Episternal carina reaches anterior pronotal margin; metasternum punctate, setose, abdominal sternites densely punctate in anterior half, with single median row of setae; pygidium with large, evenly distributed punctures and long setae.

**MATERIAL EXAMINED.** Holotype. Strand, 7.87 (SAM).

CAPE. Clifton (1 SAM); Jonkis Poort, 32.49 S–19.27 E, 2.9.1981, Endrödy-Younga (1 TM); Robertson (10 km S), 33.53 S–19.57 E, 5.12.1978, Endrödy-Younga (2 TM); Seder Berg, Clanwilliam distr. Apr. 1962, N. Leleup (2 TM); Strand (1 SAM).

**REMARKS.** This is a very distinctive, generally setose species, characterized by the distinct round striae punctures and the long recurved interstitial setae. It bears little resemblance to any other species. The type bears a 'type' label in Péringuey's handwriting, also a red SAM type label, number 2670.

**DISTRIBUTION.** Southwestern Cape Province (Fig. 50).

***Epirinus drakomontanus*** spec. nov., Figs 21, 22, 52.

**HOLOTYPE.** *Size.* Length 6.0 mm, pronotal width 3.5 mm, elytral width 4.0 mm, ratio of length of pronotum : elytra 1 : 2.

*Head.* Clypeus bidentate, with small rounded widely separated teeth, with a distinct median indentation; lateral indentation of clypeo-genal suture distinct; surface densely punctured, with sparse, short setae (Fig. 21); basal angle obtuse.

*Pronotum.* Surface densely punctate (Fig. 21); median longitudinal line distinct; lateral margin rounded; anterior angle slightly pointed.

*Elytra.* Humeral umbone large; striae indistinct, with depressed areas; interstriae with small antero-median tubercles, surface slightly raised with irregularly spaced large granules and occasional flavescent setae (Fig. 22); margin narrow; apical callosity distinct.

*Venter.* Episternal carina reaches pronotal margin; metasternum raised anteriorly, densely punctate and setose anteriorly and laterally, glabrous medially; abdominal sternites slightly raised medially with single row of large, setose punctures; sternites

with distinct lateral depressions between; pygidium very slightly raised centrally; sparsely setose.

**MATERIAL EXAMINED.** Holotype. Lesotho, Drakensberg (Tseke Tseke Gorge), 1.iii.76. 2960 m, G. Tribe (NCI).

**ETYMOLOGY.** The name *drakomontanus* is derived from the mountains in which the species was collected.

**REMARKS.** This new species, which is only known from the holotype, collected in the Drakensberg mountains (Fig. 52), is dull black, distinctly heart-shaped with large pronotum and short elytra and this, combined with the raised granular interstriae, serves to distinguish it from any other species.

*Epirinus flagellatus* (Fabricius), Figs 23, 24, 53.

**Scarabaeus flagellatus** Fabricius, 1775: 29; Gillet 1911: 43

**Scarabaeus granulatus** Olivier, 1789: 168; Gillet 1911: 43

**Scarabaeus scabratus** Fabricius, 1794: 436; Gillet 1911: 43

**Scarabaeus callosus** Thunberg, 1818: 410; Gillet 1911: 43

**Epirinus scabratus** Péringuey 1901: 91

**Epirinus vicinus** Ferreira, 1964: 7, **syn. nov.**

**Size.** Length 7,5–10,0 mm, pronotal width 5,5–7,5 mm, elytral width 5,5–7,0 mm, ratio of length of pronotum : elytra 2 : 3.

**Head.** Clypeus bidentate, teeth small, blunt, widely separated; lateral indentation of clypeo-genal suture faint; basal angle acute; dorsal surface densely punctate (Fig. 23).

**Pronotum.** Surface densely punctate (Fig. 23); median longitudinal line distinct; lateral margin and anterior angle rounded.

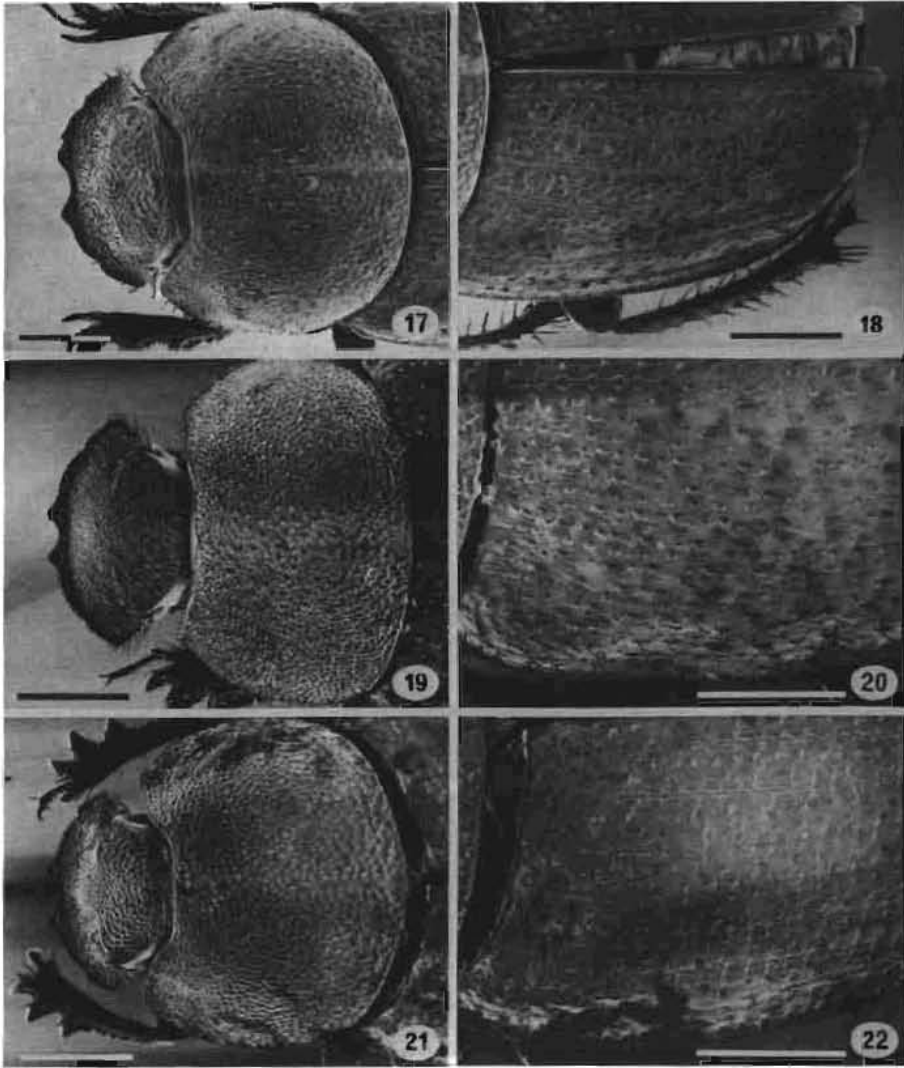
**Elytra.** Humeral umbone distinct; striae faint; interstriae with small antero-medial tubercle, surface with large glabrous raised areas and occasional setose granules (Fig. 24); epipleura narrow; apical callosity distinct.

**Venter.** Episternal carina does not reach pronotal margin; metasternum punctate, densely at posterior, sparsely at anterior; abdominal sternites densely punctured; pygidium with sparse setose granules.

**Leg.** Inner surface of metatibiae of males slightly more seriate than that of females.

**MATERIAL EXAMINED.** CAPE. Albertinia, 12.10.1973, I. D. Temby (3 DRU); Blesberg, 33.25 S 22.14 E, 6.12.1978, Endrödy-Younga (30 TM); Botrivier (6 km S), 34.15 S 19.13 E, 27.8.1983, Endrödy & Penrith (1 TM); Bredasdorp, 20.x.1971, Bornemissza & Kirk (3 DRU); Buffelsrivier Valley, 29.36 S 17.14 E, 31.8.1976, Endrödy-Younga (3 TM); Calvinia, 31.28 S 19.47 E, 18.8.1983, Endrödy & Penrith (1 TM); Cape Town (63 km N), 33.24 S 18.16 E, 30.8.1983, Endrödy & Penrith (6 TM); Cedarberg, 23.27 S 19.23 E, 21.8.1983, Endrödy & Penrith (1 TM); Clanwilliam (17 km S), 19.10.1975, H. H. Aschenborn (1 DRU); Die Vlug, nr Avontuur, 16–19.xii.1981, S. & J. Peck (4 H & AH); Droëvlakte, 34.16 S 21.24 E, 11.4.1975, M. J. & M-L. Penrith (1 SM); Eikeboom, 32.27 S 19.10 E, 1.ix.1981, Endrödy-Younga (2 TM); Elandsbay Forest, 32.18 S 18.21 E, 28.8.1981, Endrödy-Younga (1 TM); Geel-





Figs 17–22. 17–18, *Epirinus granulatus* sp. nov.; 17, head and pronotum; 18, elytron; 19–20, *Epirinus comosus* Péringuey; 19, head and pronotum; 20, elytron; 21–22, *Epirinus drakomon-tanus* sp. nov.; 21, head and pronotum; 22, elytron. Scale bar = 1 mm.

beck, 21.10.1975, H. H. Aschenborn (1 DRU); Gembok Vlake Farm, 30.30 S 17.25 E, 2.9.1977, Endrödy-Younga (3 TM); George Outenikwapas, 19-24.xii.1981, S. & J. Peck (6 H & AH); Grootberg, 33.55 S 20.51 E, 7.12.1978, Endrödy-Younga (1 TM); Grootdrif Farm, 32.24 S 18.27 E, 29.8.1981, Endrödy-Younga (1 TM); Hagas Farm, 33.24 S 22.64 E, 17.12.1978 (10 TM); Humansdorp (23 km E), 6.4.1974, I. D. Temby (5 DRU); Jeep track, 32.23 S 19.09 E, 1.9.1981, Endrödy-Younga (14 TM); Jonkis Poort, 32.49 S 19.27 E, 2.9.1981, Endrödy-Younga (8 TM); Kamieskroon, 30.12 S 18.01 E, 27.8.1977, Endrödy-Younga (1 TM); Klein Klipheuwel, 32.14 S 18.26 E, 26.8.1981, Endrödy-Younga (1 TM); Klippe Rugt Farm, 32.42 S 20.12 E, 28.10.1973, Endrödy-Younga (1 TM); Kliphoutkop, 32.17 S 18.24 E, 26.8.1981, Endrödy-Younga (2 TM); Knysna, Buffelsbaai, 21-26.12.1981, S. & J. Peck (2 H & AH); Kotzesrus, 30.57 S 17.50 E, 23.8.1979, Endrödy-Younga (1 TM); Matjiesfontein Mt., 33.16 S 20.30 E, 25.10.1978, Endrödy-Younga (9 TM); Napier (14 km NW), 24.xi.1975, H. H. Aschenborn (1 DRU); Nieuwoudville, 31.23 S 19.06 E, 21.8.1971, Endrödy-Younga (4 TM); Nuwejaarsrivier, 34.16 S 19.11 E, 13.4.1975, M. J. & M-L. Penrith (3 SM); Nuwerust Farm, 31.04 S 18.17 E, 22.8.1979, Endrödy-Younga (2 TM); Papendorp, 31.38 S 18.12 E, 22.8.1981, Endrödy-Younga (2 TM); Pearly Beach (12 km E), 34.36 S 19.36 E, 25.8.1983, Endrödy & Penrith (2 TM); Pienaarsvlak, 32.49 S 19.27 E, 2.9.1981, Endrödy-Younga (5 TM); Rietpoort Farm, 30.59 S 18.06 E, 22.8.1979, Endrödy-Younga (1 TM); Robertson (15 km W), 33.50 S 19.45 E, 5.12.1978, Endrödy-Younga (6 TM); Saamstaan Farm, 32.35 S 18.22 E, 20.8.1981, Endrödy-Younga (1 TM); Skulpbaai (2.5 km NW), 31.23 S 17.56 E, 30.8.1979, Endrödy-Younga (1 TM); Stallberg Pass, 30.27 S 18.04 E, 5.9.1977, Endrödy-Younga (1 TM); St. Helenafontein, 32.26 S 18.20 E, 30.8.1981, Endrödy-Younga (2 TM); Stellenbosch, 18.10.1971, Bornemissza & Kirk (2 DRU); Sterkstroom (16 km SE); 9.1.1973, H. H. Aschenborn (2 DRU); Strandfontein Farm, 30.33 S 17.22 E, 3.9.1977, Endrödy-Younga (5 TM); Swellendam (29 km E), 3.5.1976, Davis & Aschenborn (42 DRU); Uniondale (10 km NE), 4.5.1976, Davis & Aschenborn (32 DRU); Van Rhyns Pass, 31.23 S 19.02 E, 18.8.1983, Endrödy & Penrith (1 TM); Van Rhyns Pass, 27.9.1974, Houston, Davis, Tribe (1 DRU); Verlorevlei Farm, 32.19 S 18.22 E, 28.8.1983, Endrödy & Penrith (3 TM). ORANGE FREE STATE. Ladybrand, 11.1.1973, H. H. Aschenborn (2 DRU). No Data. 22 (SMTD); 11 (SAM); 30 (ZMHB); 19 (IRSN).

REMARKS. This species is rather variable, particularly in size, but is very distinctive, being the only one with large raised glabrous areas. *Epirinus vicinus* Ferreira, described from four specimens, is without doubt synonymous with *E. flagellatus*. All the diagnostic characters mentioned by Ferreira fall within the variation of *E. flagellatus*. The distribution range of *E. vicinus* falls within that of *E. flagellatus* and consequently we have no hesitation in regarding them as synonymous.

The types of *E. vicinus* could not be traced. They were reported by Ferreira to be in the TM and SAM but are not in either and are thought not to have been returned after that study. The type of *E. flagellatus*, which is deposited in the Zoological Museum of the University of Copenhagen, was not examined because the species is very distinctive and it was not considered worth the risk of mailing such an old specimen.

DISTRIBUTION. Widely distributed in the Cape Province and Orange Free State (Fig. 53).

*Epirinus asper* Péringuey, Figs 25, 26, 53.

***Epirinus asper*** Péringuey, 1901: 92.

*Size.* Length 7,0–10,0 mm, pronotal width 4,5–6,5 mm, elytral width 5,2–7,5 mm, ratio of length of pronotum : elytra 2 : 3.

*Head.* Clypeus bidentate, teeth large, blunt, close together; lateral indentation of clypeo-genal suture distinct; dorsal surface densely punctate (Fig. 25); basal angle acute.

*Pronotum.* Surface densely punctate (Fig. 25); median longitudinal line only visible basally; lateral margin and anterior angle rounded.

*Elytra.* Humeral umbone distinct; striae visible, with slightly thickened margins (Fig. 26); interstriae with distinct antero-median tubercle and with small surface tubercles, often with a dorsal seta; seventh interstria distinctly raised; margin wide; lateral margins crenulate; apical callosity distinct.

*Venter.* Episternal carina does not reach anterior pronotal margin; metasternum and abdominal sternites densely punctate; pygidium with deep punctures and sparse setose granules.

*Legs.* Males have inner surface of metatibia distinctly crenulate, much less so in females.

**MATERIAL EXAMINED.** Lectotype (new designation), Durban, Natal (SAM). Paralectotype, Transvaal, Lydenburg Dist. (SAM).

**NATAL.** Cathedral Peak, 28.57 S 29.12 E, 15.3.1976, Endrödy-Younga (2 TM); Cathedral Peak, 10.11.1976, C. Scholtz (4 TM); Cathedral Peak, 75 km WSW Estcourt, 7–13.12.1979, S. & J. Peck (36 H & AH); Mt. aux Sources, 6.2.1979, F. de Moor (1 TM). **TRANSVAAL.** Belfast, 2.2.1971, Bornemissza & Aschenborn (10 DRU); Machadodorp (16 km E), 8.10.1973, A. L. V. Davis (18 DRU); Mt Sheba (12 km W Pilgrims Rest), 14.3.1975, W. W. K. Houston (1 DRU).

**REMARKS.** This species varies somewhat in size but is very distinctive and easy to identify by the presence of the raised granulose seventh elytral interstria.

The specimen designated lectotype bears a label with 'type' in Péringuey's handwriting and a red SAM type label, number 2667a. The paralectotype bears an old label with the number 462 and a recent red SAM type label, number 2667b.

**DISTRIBUTION.** High-lying areas of Natal and the Transvaal (Fig. 53).

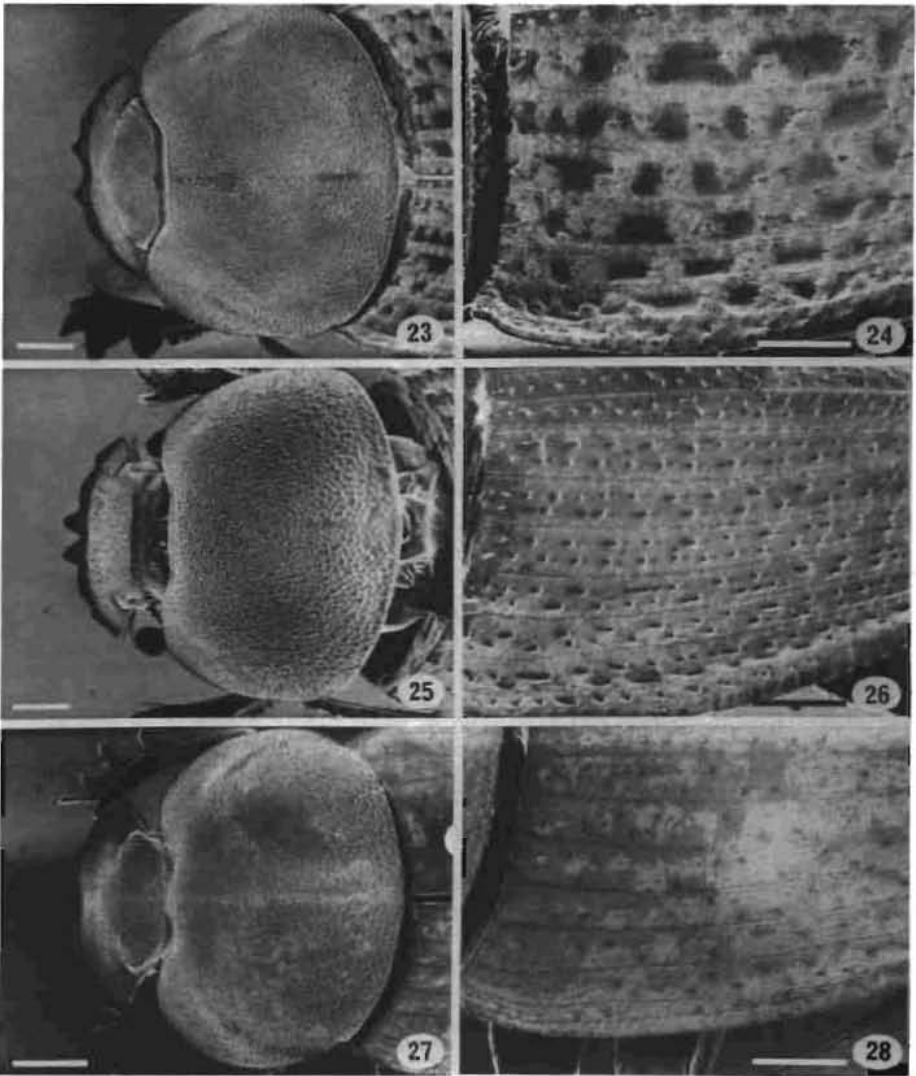
***Epirinus mucrodentatus*** sp. nov., Figs 27, 28, 52

**HOLOTYPE.** *Size.* Length 8,0 mm, pronotal width 6,0 mm, elytral width 5,5 mm, ratio of length of pronotum : elytra 3 : 5.

*Head.* Clypeus bidentate, teeth small, pointed, widely separated, with deep median and lateral indentation; lateral indentation of clypeo-genal suture distinct; surface densely punctate, sparsely setose (Fig. 27); basal angle acute.

*Pronotum.* Very broad, long, acutely attenuated posteriad; anterior margin rounded; surface densely punctate with faint sub-median depression (Fig. 27).

*Elytra.* Humeral umbone distinct; striae distinct, with large punctures; inter-



Figs 23-28. 23-24, *Epirinus flagellatus* F; 23, head and pronotum; 24, elytron; 25-26, *Epirinus asper* Péringuey; 25, head and pronotum; 26, elytron; 27-28, *Epirinus microdentatus* sp. nov.; 27, head and pronotum; 28, elytron. Scale bar = 1 mm.

striae with small antero-median tubercles, surface with irregularly spaced, barely raised, setose granules (Fig. 28); margin wide; apical callosity distinct.

*Venter*. Episternal carina not reaching pronotal margin; metasternum shiny, sparsely punctate and setose; abdominal sternites shiny, sparsely punctate on anterior half of each sternite; pygidium sparsely setose.

**MATERIAL EXAMINED.** Holotype. Mount Sheba, E. Tvl, 10-21.1.74, G. F. Bornemissza (NCI). Paratype. Pilgrim's Rest, E. Tvl. (7 mi. W), 6.11.71, Bornemissza & Aschenborn (H & AH).

**ETYMOLOGY.** The name *microdentatus* is derived from the characteristic pointed clypeal teeth.

**REMARKS.** This distinctive new species can easily be distinguished from any other by the shape of the clypeus margin and teeth and by the very broad, long and posteriorly attenuated pronotum. Both known specimens were collected in the eastern Transvaal highlands (Fig. 52).

***Epirinus rugosus* spec. nov., Figs 29, 30, 52**

**HOLOTYPE.** Size. Length 8,5 mm, pronotal width 4,7 mm, elytral width 4,7 mm, ratio of length of pronotum: elytra 1:2.

*Head.* Clypeus bidentate, with small, pointed, widely separated teeth with a shallow median indentation; lateral indentation of clypeo-genal suture faint; surface densely punctured, with sparse short black setae (Fig. 29); basal angle obtuse.

*Pronotum.* Surface densely punctate, with sparse short black setae (Fig. 29); median longitudinal line visible basally; lateral margin slightly oblique for anterior one-third; anterior angle slightly pointed.

*Elytra.* Humeral umbone distinct; striae distinct, with round punctures (Fig. 30); interstriae with small antero-median tubercles; alternate interstriae slightly raised, particularly third and fifth, all with irregularly-spaced granules and sparse black setae; margin wide, apical callosity large.

*Venter.* Episternal carina not reaching pronotal margin; metasternum very densely punctate, more so posteriorly, punctures also large posteriorly; abdominal sternites densely punctured; pygidium with sparse, pointed black setae.

**MATERIAL EXAMINED.** Holotype. S. Afr., Cape, Cederberg, Jeep track, 1550 m, 32.23 S 19.08 E, 1.9.1981; E-Y: 1875, groundtraps, 63 days, leg. Endrödy-Younga (TM). Paratypes. Same data as holotype (5 TM, 1 H & AH); same data as holotype except, 1480 m (1 BMNH, 1 TM); S. Afr. Swartberge, Blesberg; S 1820 m, 33.25 S 22.40 E, 17.12.1978; E-Y: 1535, groundtraps 75 days, leg. Endrödy-Younga (1 TM); Cape Town, 63 km N, 33.24 S-18.16 E, 30.8.1983 (1 TM).

**ETYMOLOGY.** The name *rugosus* is derived from the superficial wrinkled appearance of the species.

**REMARKS.** This new species, which is known only from mountains in the southwestern Cape (Fig. 52), varies somewhat in size and in the shape of the clypeal

teeth. Length varies from 6,5–8,5 mm, pronotal width from 4,0–4,7 mm and elytral width 4,0–4,7 mm. The clypeal teeth vary from small, pointed and widely separated to small, rounded and widely separated to quite large, blunt and closer together, as in the paratype from the Swartberge. This species is most similar to *E. pygidialis* (see below) and *E. scrobiculatus* but can easily be distinguished from the latter by the presence of raised third and fifth elytral interstriae; *E. scrobiculatus* does not have raised interstriae.

***Epirinus pygidialis* sp. nov.**, Figs 31, 32, 54

**HOLOTYPE.** Size. Length 6,5 mm, pronotal width 3,8 mm, elytral width 3,7 mm, ratio of length of pronotum: elytra 3:5.

**Head.** Clypeus bidentate, with prominent, pointed, widely-separated teeth, with a distinct median depression; lateral indentation of clypeo-genal suture distinct; genal margin slightly concave; surface densely punctured, with sparse, short flavescent setae (Fig. 31); basal angle acute.

**Pronotum.** Very broad, acutely attenuated posteriad, margins rounded; surface densely punctate (Fig. 31) with very faint submedian depression.

**Elytra.** Humeral umbone distinct; striae distinct, with large, almost contiguous round punctures; interstriae slightly raised, with two rows of very small round granules and irregularly-spaced, short, flavescent setae, also with irregularly-spaced median punctures (Fig. 32); margin wide; apical callosity large.

**Venter.** Episternal carina not reaching pronotal margin; metasternum densely punctate except for a small median area; abdominal sternites densely punctate over whole surface; pygidium densely punctate, sparsely setose.

**MATERIAL EXAMINED.** Holotype. Rep. South Africa: Natal, 75 km WSW Estcourt, Cathedral Peaks For. Stn., 11.12.xii.79, S. & J. Peck; Rainbow Gorge, Podocarp. For, 1500 m, minidung cup tps (TM). Paratypes. Transvaal, Lydenburg, F. Wilms, S. V. (1 ZMHB, 1 H & AH).

**ETYMOLOGY.** The name *pygidialis* is derived from the characteristic punctate pygidium.

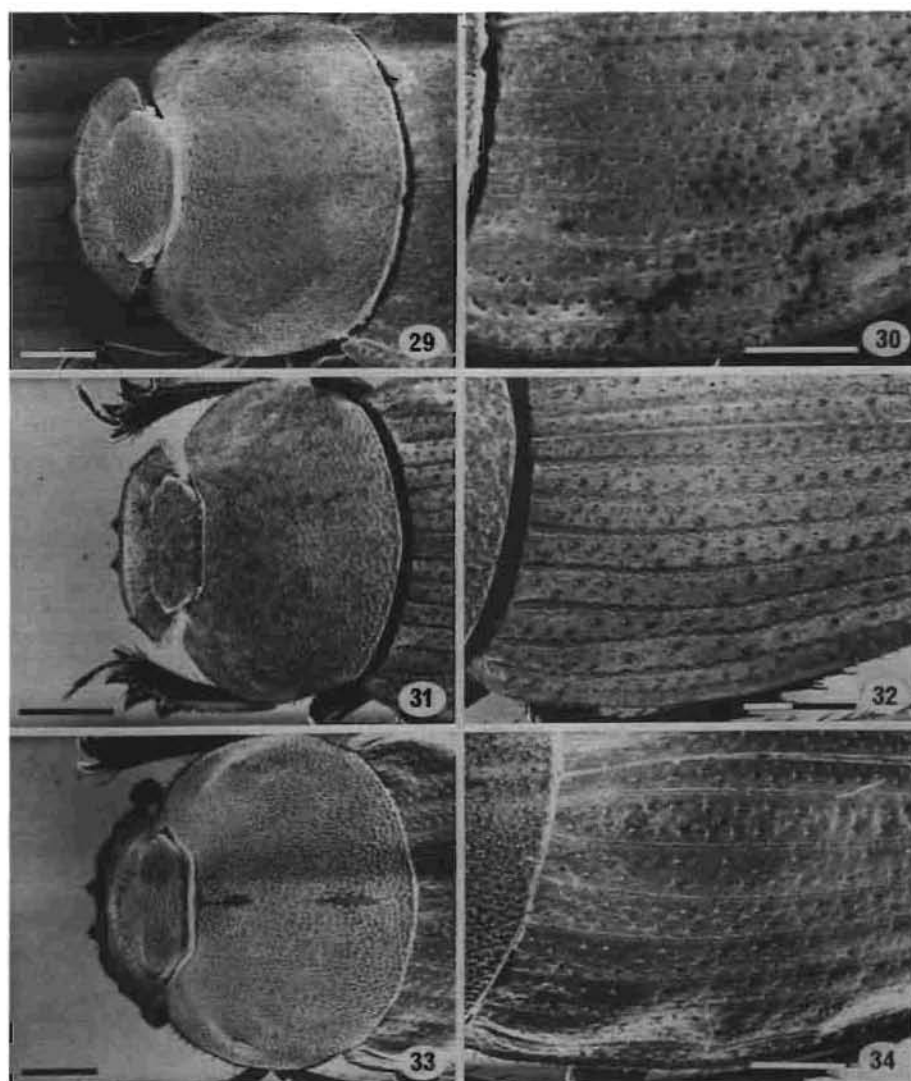
**REMARKS.** This new species, known only from the highlands of Natal and the Transvaal (Fig. 54), varies little. Length varies from 6,5–7,2 mm, pronotal width from 3,8–4,0 mm and elytral width from 3,7–4,1 mm. The paratypes have the points of the clypeal teeth blunt, the genal margins straight and the metasternum evenly punctate. It is most similar to *E. rugosus* but can be distinguished from the latter by the more distinct indentation of the clypeo-genal suture, flavescent body setae, less densely punctate metasternum and punctate pygidium; *E. rugosus* has the indentation of the clypeo-genal suture less distinct, black body setae, very densely punctate metasternum and impunctate pygidium. The two species are geographically widely separated.

***Epirinus scrobiculatus* Harold**, Figs 33, 34, 51

*Epirinus scrobiculatus* Harold, 1880: 152.

**Size.** Length 5,5–8,0 mm, pronotal width 4,0–5,5 mm, elytral width 4,0–5,5 mm, ratio of length of pronotum: elytra 3:5.

**Head.** Clypeus bidentate, teeth sharply pointed, widely separated, with deep



Figs 29–34. 29–30, *Epirinus rugosus* sp. nov.; 29, head and pronotum; 30, elytron; 31–32, *Epirinus pygidialis* sp. nov.; 31, head and pronotum; 32, elytron; 33–34, *Epirinus scrobiculatus* Harold; 33, head and pronotum; 34, elytron. Scale bar = 1 mm.

median and anterior indentation; lateral indentation of clypeo-genal suture distinct; surface punctate; setose (Fig. 33); basal angle acute.

*Pronotum*. Surface densely punctate with sparse, short setae (Fig. 33); median longitudinal line barely visible; lateral margins and anterior angle rounded.

*Elytra*. Humeral umbone distinct; striae faint, with depressed areas and slightly thickened margins (Fig. 34); interstriae with barely distinguishable antero-median tubercles; interstitial surface with two relatively well defined rows of small granules and dark setae; margins widen perceptibly anteriorly; apical callosity barely raised; epipleural sides with faint anterior stria and distinct setose granules which are progressively more dense anteriorly and sparse posteriorly.

*Venter*. Episternal carina not reaching anterior pronotal margin; metasternum sparsely punctate, setose; abdominal sternites densely punctured on anterior half and sparsely or not at all on posterior half; pygidium slightly raised medially, sparsely setose laterally.

**MATERIAL EXAMINED.** Holotype (label illegible) (ZMBH).

CAPE. Grootdrif Farm, 32.24 S 18.27 E, 29.8.1981, Endrödy-Younga (1 TM); Hondeklip Bay (12 km E), 30.21 S 17.25 E, 20.8.1977, Endrödy-Younga (1 TM); Katdoringvlei, 31.07 S 17.52 E, 27.8.1979, Endrödy-Younga (4 TM); Kotzesrus, 30.57 S 17.50 E, 23.8.1979, Endrödy-Younga (8 TM); Rooidam Farm, 31.04 S 17.48 E, 26.8.1979, Endrödy-Younga (6 TM); Vanwyksfontein Farm, 30.38 S 25.23 E, 22.9.1983, Penrith (1 TM); Verlorevlei Farm, 32.19 S 18.22 E, 28.8.1981, Endrödy-Younga (26 TM); Vredendal (20 km W), 31.40 S 18.31 E, 19.8.1983, Endrödy & Penrith (2 TM); Wallekraal, Namaqualand (2 SAM). No data. 11 (SMTD), 5 (ZMHB), 6 (IRSN).

**REMARKS.** *Epirinus scrobiculatus* is most similar to *E. obtusus* and *E. striatus* nov. but can be distinguished from them as discussed under each of those species.

**DISTRIBUTION.** Southern Namaqualand and southwestern Cape Province (Fig. 51).

### ***Epirinus striatus* sp. nov., Figs 35, 36, 52**

**HOLOTYPE.** Size. Length 9,5 mm, pronotal width 5,7 mm, elytral width 6,0 mm, ratio of length of pronotum : elytra 3:5.

*Head*. Clypeus bidentate, but teeth broad, barely protruding and widely separated, with slight indentation between; lateral indentation of clypeo-genal suture faint; surface densely punctate without setae (Fig. 35); basal angle acute.

*Pronotum*. Surface densely punctate, with occasional scattered, short setae (Fig. 35); median longitudinal line visible submedially; lateral margin rounded, anterior angle slightly pointed.

*Elytra*. Humeral umbone visible; striae very obvious, with distinct round punctures and thickened lateral margins (Fig. 36); interstriae with distinct, small antero-median tubercles; interstitial surface with two relatively well defined rows of small granules and dark setae; margins slightly wider at posterior than at anterior; apical callosity barely raised; epipleural sides with deep anterior stria and lateral, setose widely-spaced granules extend posteriad.



*Venter*. Episternal carina does not reach pronotal margin; metasternum sparsely punctate, setose; abdominal sternites densely and deeply punctured on anterior two-thirds, posterior one-third glabrous; pygidium punctate, setose.

**MATERIAL EXAMINED.** Holotype, male. S. Afr. Cape Karroo, Zwartskraal farm 33.10 S 22.32 E, 6.5.1980: E-Y: 1708, groundtraps, 41 days, leg. R. Oosthuizen (TM). Paratypes. Same data as holotype (8 TM, 1 H & AH); same data as above except date, 30.4.1976; E-Y: 1570b (66 TM, 1 H & AH, 1 BMNH, 1 MNHN); same data as above except date 26.6.1980: E-Y: 1709b (73 TM, 1 H & AH, 1 BMNH, 1 MNHN); same data as above except date 18.3.1980; E-Y: 1703 (29 TM). Same data as above except following dates (all in TM), 8.11.1978 (38); 1.2.1979 (15); 2.3.1979 (40); 31.3.1979 (49); 11.6.1979 (95); 23.7.1979 (99); 5.9.1979 (19); 25.10.1979 (8); 15.12.1979 (31); 1.2.1980 (32); 22.9.1980 (85); 8.11.1980 (42); 26.11.1980 (33).

**ETYMOLOGY.** The name *striatus* is derived from the distinct elytral striae.

**REMARKS.** Besides size variation and the results of abrasion, particularly on the clypeus, this species varies little. Length varies from 7.0–9.5 mm, pronotal width from 4.0–5.7 mm and elytral width from 4.0–6.0 mm.

With the exception of one specimen all were collected in winter. This is somewhat unusual for the genus, even for those species that occur in the winter rainfall area of the Cape. All specimens of the type-series were collected on the same farm in the Karroo (Fig. 52).

This species is similar to *E. scrobiculatus* and *E. obtusus*. It can be distinguished from the former by the presence of distinct elytral striae, blunt clypeal teeth, distinct striae on epipleural sides and punctate pygidium; *E. scrobiculatus* has faint elytral striae, pointed clypeal teeth, faint striae on epipleural sides and pygidium without punctures. *Epirinus striatus* shares the blunt clypeal teeth with *E. obtusus* but has distinct elytral striae and abdominal sternites with punctures anteriorly; *E. obtusus* has the striae faint and sternites covered in punctures.

### *Epirinus obtusus* Boheman, Figs 37, 38, 49

***Epirinus obtusus*** Boheman, 1857: 199; Péringuey 1901: 93.

*Size.* Length 6.0–10.0 mm, pronotal width 7.0–8.5 mm, elytral width 7.5–9.0 mm, ratio of length of pronotum: elytra 2:3.

*Head.* Clypeus bidentate, teeth broad, blunt widely separated; lateral indentation of clypeo-genal suture faint, surface densely punctate (Fig. 37); basal angle obtuse.

*Pronotum.* Surface densely punctate with small granules and sparse setae (Fig. 37); lateral margin and anterior angle rounded.

*Elytra.* Humeral umbone distinct; striae faint, with depressed areas and slightly thickened lateral margins; interstriae with small antero-median tubercles (Fig. 38); interstitial surface with two relatively well defined rows of small granules and dark setae; margins widen perceptibly posteriorly; apical callosity barely raised; epipleural sides smooth, at most with sparse setae and granules.

*Venter.* Episternal carina not reaching anterior pronotal margin; metasternum shiny, with very sparse small anterior punctures and small posterior area of large punctures, sparsely setose; abdominal sternites densely punctured; pygidium with very

slightly raised glabrous median longitudinal ridge, sparsely granulate and setose laterally.

**MATERIAL EXAMINED.** Holotype, Caffraria, J. Wahlberg (NRS).

CAPE. Addo N.P., 22.10.1971, Bornemissza & Kirk (16 DRU); Aliwal North (13 km N), 13.11.1974, I. D. Temby (1 DRU); Cookhouse (5 mi S), 29.10.1971, Bornemissza & Kirk (1 DRU); Cookhouse (2 SAM); Cradock, Mtn Zebra N.P., 29.10.1971, Bornemissza & Kirk (2 DRU); Grahamstown (24 km E), 4.2.1973, A. L. V. Davis (1 DRU); Maclear (16 km N), 5.12.1974, H. H. Aschenborn (1 DRU); Mt. Ayliff, Transkei, 9.11.1974, I. D. Temby (1 DRU); Paterson, 17.5.1971, H. H. Aschenborn (1 DRU); Postmasburg (32 km E), 27.3.1974, I. D. Temby (1 DRU); Tarkastad, 30.10.1971, Bornemissza & Kirk (4 DRU); Wellwood Farm, 31.59 S 24.28 E, 14.9.1983, Penrith (13 TM). ORANGE FREE STATE. Smithfield (13 km NE), 22.1.1976, C. F. Dewhurst (2 DRU); Zastron (11 km N), 31.1.1973, A. L. V. Davis (1 DRU). No Data. 1 (DRU), 7 (ZMHB); 18 (IRSN).

**REMARKS.** This species is quite variable in size and shape of the clypeal teeth but the latter are seldom pointed and never with an indentation just laterad of the clypeal teeth. It is most similar to *E. striatus* sp. nov. (see above) and *E. scrobiculatus* Harold. It can be distinguished from *E. striatus* as discussed under that species and from *E. scrobiculatus* by the presence of blunt clypeal teeth without the lateral indentation and by the presence of punctures covering the whole surface of each abdominal sternite; *E. scrobiculatus* has pointed clypeal teeth with distinct lateral indentation and abdominal sternites with punctures on the anterior half.

**DISTRIBUTION.** Southeastern and eastern Cape Province (Fig. 49).

*Epirinus silvestris* (Cambefort), Figs 39, 40, 52

**Endroedyantus silvestris** Cambefort, 1978: 201.

**Size.** Length 3.5–6.5 mm, pronotal width 2.2–4.0 mm, elytral width 2.2–4.0 mm, ratio of length of pronotum : elytra 3 : 5.

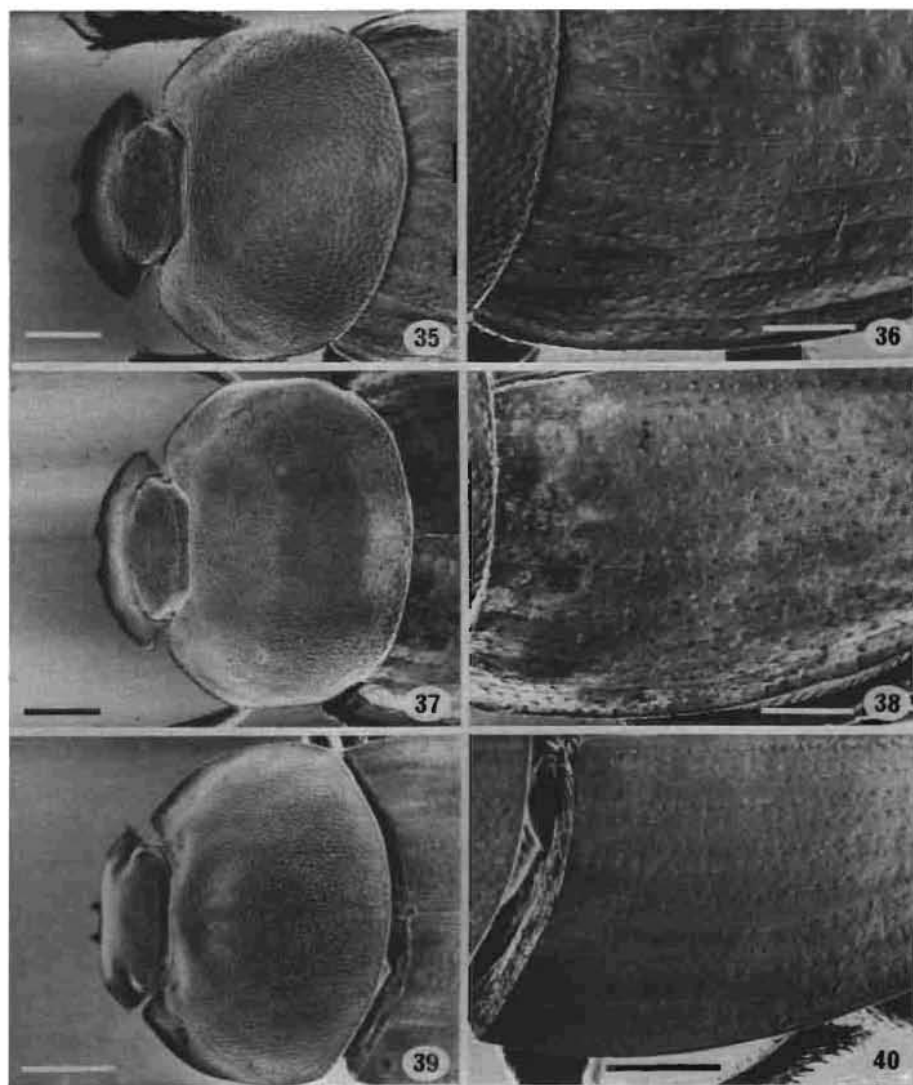
**Head.** Clypeus bidentate, with pointed, widely separated teeth, with distinct median indentation; lateral margin without interruption; surface densely punctate (Fig. 39); basal angle obtuse.

**Pronotum.** Surface densely punctate (Fig. 39); median longitudinal line visible basally as line or slight depression, lateral margin rounded; anterior angle slightly pointed.

**Elytra.** Striae visible as lines, barely punctate; interstriae slightly tectiform to planate sometimes with very small, sparse granules and short flavescens setae (Fig. 40); epipleura darkly sclerotized, distinctly recurved; apical tubercles obsolete.

**Venter.** Episternal carina reaching anterior pronotal margin; metasternum with widely spaced small, shallow punctures; abdominal sternites with large, dense punctures on anterior half and a single median row of long recurved setae; pygidium with variably recurved setae, sometimes more dense on slightly raised lateral areas; without distinctly raised tubercles or costae.

**MATERIAL EXAMINED.** Holotype. South Africa: S. Cape, Harkerville Forest, 34.04 S 23.10 E, 9.12.1976; E-Y: 1304, elephant dung, leg. Endrödy-Younga (TM).



Figs 35–40. 35–36, *Epirinus striatus* sp. nov.; 35, head and pronotum; 36, elytron; 37–38, *Epirinus obtusus* Boheman; 37, head and pronotum; 38, elytron; 39–40, *Epirinus silvestris* Cambefort; 39, head and pronotum; 40, elytron. Scale bar = 1 mm.

CAPE. Dwesa Forest, Transkei, 32.15 S 28.49 E, 11.12.1979, Endrödy-Younga (1 TM); George, 33.58 S 22.28 E, 4.9.1979, Endrödy-Younga (2 TM); Harkerville Forest, 34.04 S 23.10 E, 9.12.1976, Endrödy-Younga (3 TM); Knysna, 24.10.1971, Bornemissza & Kirk (1 DRU); Knysna, Diepwalle, 13.12.1981, S. & J. Peck (12 H & AH); Knysna, Garden of Eden, 15-18.12.1981, S. & J. Peck (8 H & AH); Knysna, Kranshoek, 23.12.1981, S. & J. Peck (6 H & AH); Stormsrivier, 6-9.12.1981, S. & J. Peck (33 H & AH); Tzitzikama Coast N.P., 8-10.12.1981, S. & J. Peck (40 H & AH).

**REMARKS.** This species is easy to distinguish from any other without a humeral umbone by the absence of tubercles or costae on the pygidium.

**DISTRIBUTION.** Occurs mainly in relict forests of the southern Cape Province (Fig. 52).

***Epirinus davisi* sp. nov.**, Figs 41, 42, 49

**HOLOTYPE.** Size. Length 4,5 mm; pronotal width 2,7 mm, elytral width 2,7 mm, ratio of length of pronotum: elytra 3:5.

**Head.** Clypeus bituberculate, teeth prominent, pointed, with distinct median indentation; lateral margin without interruption; surface densely punctate on frons and laterally on clypeus, glabrous medio-anteriorly, punctures with associated setae (Fig. 41); basal angle obtuse.

**Pronotum.** Surface densely punctate with round to elongate punctures and adjacent setae; median longitudinal line faint anteriorly but visible as deep basal depression (Fig. 41); lateral of median line, submedially, is a faint depression on either side; lateral margin and anterior angle rounded.

**Elytra.** Striae distinct, with wide, elongate, distinctly separated punctures, interstriae tectiform, glossy with lateral row of broad flavescent setae with recurved points (Fig. 42); margin darkly sclerotized, raised; apical tubercles obsolete.

**Venter.** Episternal carina reaching anterior pronotal margin; metasternum virtually impunctate, with a few punctures basally; abdominal sternites with a single median row of large punctures, each with adjacent seta; pygidium bituberculate.

**MATERIAL EXAMINED.** Holotype. Z.A. 33 Dhlizna For. Eshowe Dist., humus, x. 1960, N. Leleup leg. (TM). Paratypes. Same data as holotype (2 TM, 1 H & AH).

**ETYMOLOGY.** This new species is named for Adrian Davis of DRU in recognition of his interest in scarabs.

**REMARKS.** There is very little variation (even in size) within the small series of specimens examined. This new species, known only from the type locality (Fig. 49) is readily distinguished from any other by the impunctate metasternum and the foveate pronotum. It superficially resembles *E. hilaris* and *E. convexus* but can be distinguished from them by the above characters.

***Epirinus montanus* sp. nov.**, Figs 43, 44, 50

**HOLOTYPE.** Size. Length 6,5 mm, pronotal width 3,8 mm, elytral width 3,8 mm, ratio of length of pronotum: elytra 3:5.

*Head.* Clypeus bidentate, teeth small, pointed, widely separated, with a deep median indentation; lateral margin without interruption; surface densely punctate (Fig. 43); basal angle obtuse.

*Pronotum.* Surface densely punctate but with diameter of punctures less than distance between them (Fig. 43); median longitudinal line very faint; lateral margin rounded, anterior angle slightly pointed.

*Elytra.* Striae visible as lines, barely punctate; interstriae tectiform medially, more planate laterad, with sparse small granules and very short flavescent setae, apical tubercles on third and fifth interstriae prominent (Fig. 44); margin darkly sclerotized, narrow and distinctly raised.

*Venter.* Episternal carina reaching anterior pronotal margin; metasternum punctate, punctures shallow, diameter of each considerably less than distance between them; abdominal sternites with a median row of large, shallow punctures, each with an adjacent seta; pygidium with a distinct transverse costa, with short flavescent setae.

**MATERIAL EXAMINED.** Holotype. S. Afr. Swartberge, Blesberg-W, 1820 m, 33.25S 22.40E, 17.12.1978; E-Y: 1536, groundtraps, 75 days, leg. Endrödy-Younga (TM). Paratypes. Same data as holotype (16 TM, 2 H. & A.H., 1 BMNH, 1 MNHN); same data as above except 6.11.1978; E-Y: 1512 (16 TM, 1 H. & A.H., 1 BMNH, 1 MNHN).

**ETYMOLOGY.** The name *montanus* is derived from the montane habitat where the species occurs.

**REMARKS.** Length varies in this species from 5.6–5.0 mm, pronotal width from 3.2–2.8 mm, and elytral width from 3.2–3.8 mm. The clypeal teeth vary a little in shape, some being more rounded than others and the distance between and depth of median indentation vary slightly. The pygidium varies between costate as in the holotype, with two distinct elongate tubercles or with intermediates in which the ridge is partially interrupted. Besides these differences there is little variation within the species. It is most similar in size to *E. silvestris* but can easily be distinguished from the latter by the presence of distinct, raised pygidial tubercles or costa; the latter has at most, slightly raised lateral areas. *E. montanus* can be distinguished from the other (smaller) species with tuberculate or costate pygidium by the pronotal punctures with diameter less than the distance between punctures. The other species have the diameter of the punctures greater than the distance between them. *E. montanus* is known only from the type locality (Fig. 50).

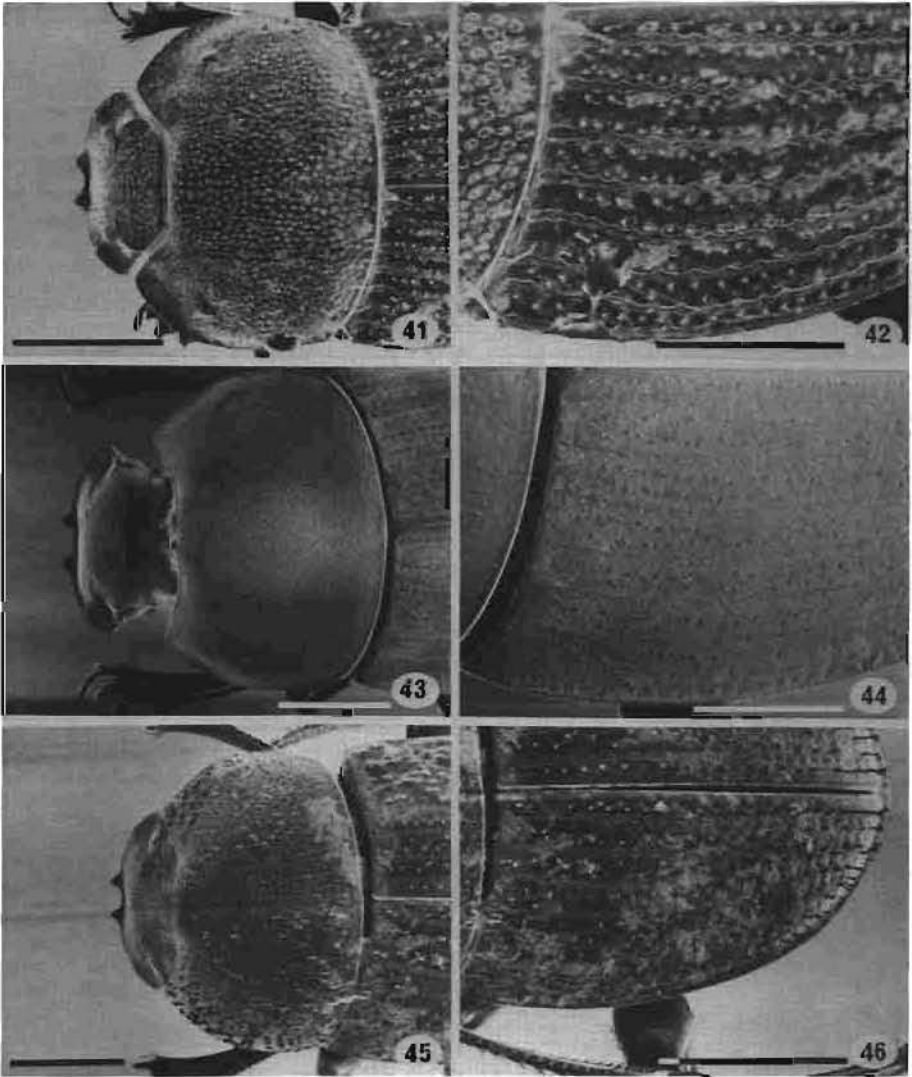
***Epirinus convexus* sp. nov., Figs 45, 46, 54**

**HOLOTYPE.** Size. Length 4.8 mm, pronotal width 2.7 mm, elytral width 2.7 mm, ratio of length of pronotum: elytra 3:5.

*Head.* Clypeus bidentate, teeth prominent, with distinct median indentation; lateral margin without interruption; surface densely punctate (Fig. 45); basal angle obtuse.

*Pronotum.* Surface densely punctate, setose (Fig. 45); lateral margin rounded; anterior angle pointed, with lateral indentation.

*Elytra.* Striae distinct, depressed, with elongate, narrow punctures (Fig. 46);



Figs 41-46. 41-42, *Epirinus davisi* sp. nov.; 41, head and pronotum; 42, elytron; 43-44, *Epirinus montanus* sp. nov.; 43, head and pronotum; 44, elytron; 45-46, *Epirinus convexus* sp. nov.; 45, head and pronotum; 46, elytron. Scale bar = 1 mm.

interstriae slightly raised, with distinct rows of broad flavescent setae with recurved points; margin narrow, convex.

*Venter.* Episternal carina reaching anterior pronotal margin; metasternum densely punctate, punctures with diameter approximately equal to distance between them; abdominal sternites with anterior row of large punctures; pygidium bituberculate.

**MATERIAL EXAMINED.** Holotype. S. Afr., Transkei, The Haven 32.15S 28.55E, 9.12.1979; E-Y: 1695, groundtraps, three days, leg. Endrödy-Younga (TM). Paratypes. Same data as holotypes (35 TM, 2 H. & A. H., 1 BMNH, 1 MNHN); S. Afr. Transkei, Dwesa forest 32.15S 28.49E, 11.12.1979; E-Y: 1697, groundtraps, 10 days, leg. Endrödy-Younga (35 TM, 2 H. & A.H., 1 BMNH, 1 MNHN); same data except 26.2.1985 (16 TM); S. Africa, Port St. John, Pondoland, Nov. 1923, R. E. Turner (BMNH), same data, except 6–25 Feb. 1924 (BMNH) and July 10.31, 1923 (BMNH).

**ETYMOLOGY.** The name *convexus* is derived from the convex shape of the elytra.

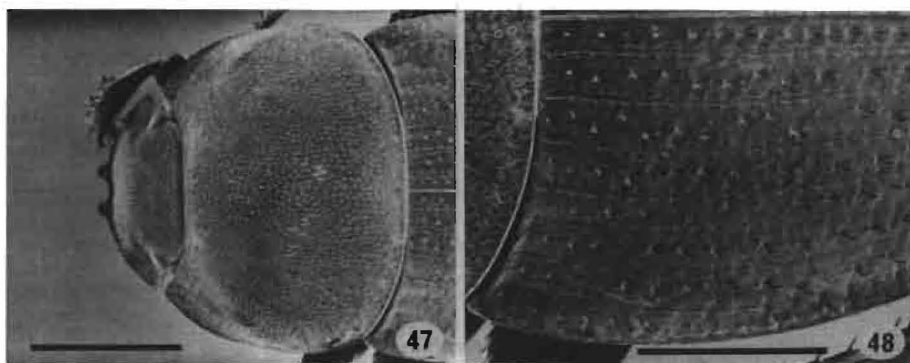
**REMARKS.** Besides size variation and the results of abrasion, particularly to the pilosity, this species varies little. Length varies from 3.2–4.8 mm, pronotal width from 2.0–2.7 mm and elytral width from 2.0–2.7 mm. This new species is most similar to *E. hilaris* but can be distinguished from the latter by the dense covering of broad setae, the convex epipleura and the metasternal punctures which have the diameter approximately equal to the distance between them; *E. hilaris* has a less dense covering of setae which are also narrower; the elytral sides are concave and the metasternal punctures have a diameter of less than the distance between them. The new species is known only from two localities in the Transkei (Fig. 54).

*Epirinus hilaris* Péringuey, Figs 47, 48, 54

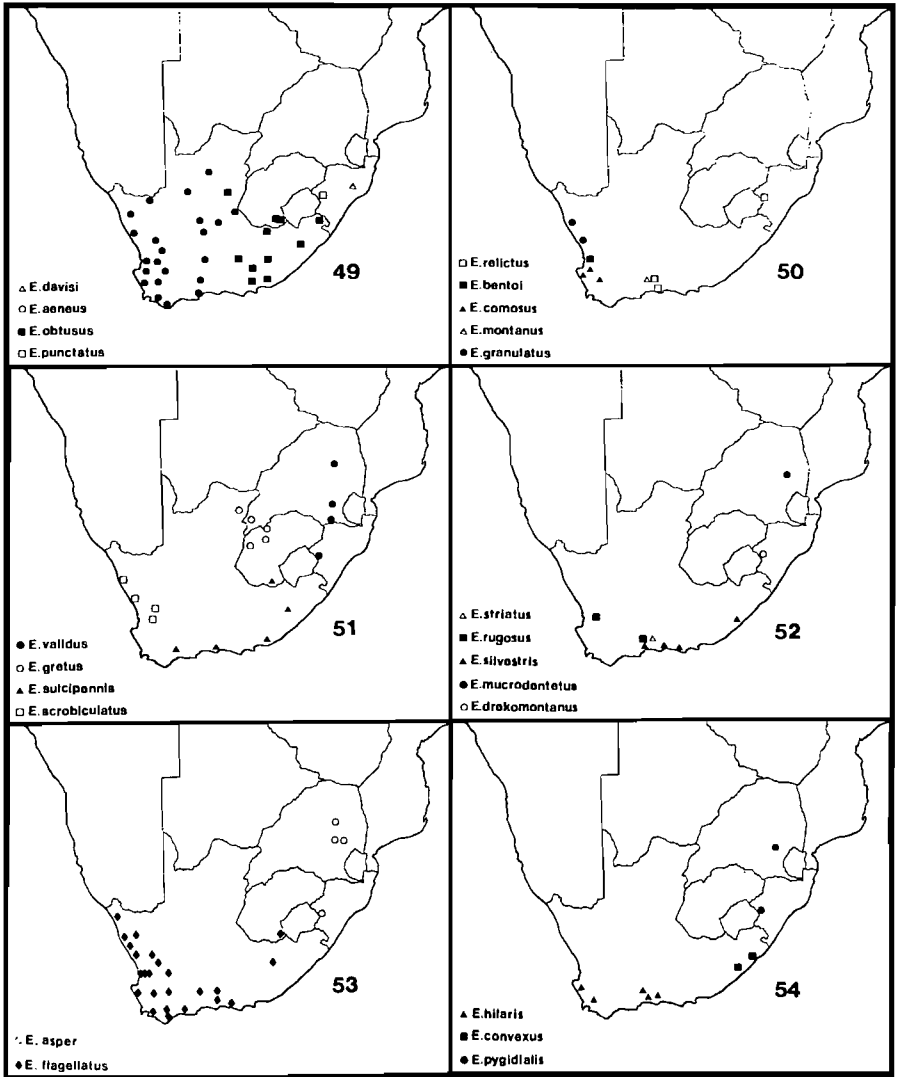
*Epirinus hilaris* Péringuey, 1901:94

*Endroedyantus youngae* Cambefort, 1978: 204 **syn. nov.**

*Size.* Length 3.0–4.5 mm, pronotal width 1.9–2.8 mm, elytral width 1.9–2.8 mm, ratio of length of pronotum: elytra 3:5.



Figs 47–48. *Epirinus hilaris* Péringuey; 47, head and pronotum; 48, elytron. Scale bar = 1 mm.



Figs 49–54. Distribution maps of *Epirinus* species; 49, *Epirinus davisi* sp. nov., *E. aeneus* Wiedemann, *E. obtusus* Boheman, *E. punctatus* sp. nov.; 50, *Epirinus relictus* sp. nov., *E. bento* Ferreira, *E. comosus* Péringuey, *E. granulatus* sp. nov., *E. montanus* sp. nov.; 51, *Epirinus validus* Péringuey, *E. sulcipennis* Boheman, *E. scrobiculatus* Harold, *E. gratus* Péringuey; 52, *Epirinus silvestris* Cambefort, *E. striatus* sp. nov., *E. rugosus* sp. nov., *E. mucrodentatus* sp. nov., *E. drakomontanus* sp. nov.; 53, *Epirinus flagellatus* F., *E. asper* Péringuey; 54, *Epirinus convexus* sp. nov., *E. pygidialis* sp. nov., *E. hilaris* Péringuey.



*Head.* Clypeus bidentate, with pointed, widely separated teeth, with distinct median indentation; lateral margin without interruption; surface densely punctate (Fig. 47); basal angle obtuse.

*Pronotum.* Surface densely punctate (Fig. 47); faint median longitudinal depression sometimes basally visible; lateral margin rounded, anterior angle slightly pointed.

*Elytra.* Striae faint, barely depressed; interstriae slightly tectiform to flat with occasional very small sparse granules and thin setae (Fig. 48); third and fifth interstriae sometimes with very small, apical, pointed tubercles; margins concave, distinctly elevated.

*Venter.* Episternal carina reaching anterior pronotal margin; metasternum sparsely punctate, diameter of punctures considerably less than distance between them; abdominal sternites with large, dense punctures on anterior half and a single median row of setae; pygidium with two distinct elongate tubercles, a continuous ridge or intermediate, with an interrupted ridge.

**MATERIAL EXAMINED.** Lectotype *hilaris* (new designation), C.T. [Cape Town], 8.87 (SAM). Holotype *youngae*, South Africa, W. Cape, Hawequas, 33.34S 19.08E, 5.11.1973, E-Y, 206 Endrödy-Younga (TM).

CAPE. Blesberg-W, 33.25S 22.40E, 17.12.1978, Endrödy-Younga (1 TM); Die Vlug, nr. Avontuur, 16–19.12.1981, S. & J. Peck (1 H. & A.H.); George, Outeniekwapas, 19–24.12.1981, S. & J. Peck (3 H. & A.H.) Hawequas Mt, 33.40S 19.05E, 4.12.1978, Endrödy-Younga (6 TM); Knysna, Buffelsnek, 16–19.12.1981, S. & J. Peck (7 H. & A.H.); Outeniekwa Pass, 33.53S 22.23E, 4.11.1978, Endrödy-Younga (5 TM); Ruitersbos, 33.53S 22.01E, 15.8.1979, Breytenbach (5 TM). No. data 2 (SAM).

**REMARKS.** This species is most similar to *E. convexus* but can be distinguished from the latter by the shape of the epipleura, body setae and metathoracic punctuation (see under *E. convexus*).

*Endroedyantus youngae* Cambefort is undoubtedly conspecific with *Epirinus hilaris* Péringuey. Cambefort (1978), in the description of *E. youngae*, made no mention of having examined the Péringuey type so was probably unaware of it.

The type of *hilaris* bears a label with *Epirinus hilaris* in Péringuey's handwriting, also a red SAM type label number 2669. Only one of the original type series of several could be traced.

**DISTRIBUTION.** Southern and southwestern Cape Province (fig. 54).

### Incertae sedis

#### *Epirinus hopei* (Castelnau)

**Scarabaeus hopei** Castelnau 1840: 70

**Epirinus hopei** Gillet 1911:

### ACKNOWLEDGEMENTS

This project was undertaken in the Department of Biology, Carleton University, Ottawa and was supported by a grant to C. H. Scholtz from the S.A. Council for

Scientific and Industrial Research and the University of Pretoria and one to H. F. Howden from the Natural Sciences and Engineering Research Council of Canada. This assistance is gratefully acknowledged.

We would also like to thank L. Ling for the electron micrographs and M. Lucas, T. K. Philips and K. McLachlan for technical assistance.

Finally, we are very grateful to the curators of the collections listed in the Introduction from whom study material was borrowed.

#### REFERENCES

- BOHEMAN, C. H. 1857. Einen Teil der Scarabacidae u. Lucanidae. In: *Insecta Caffraria annis 1838-1845 a J. A. Wahlberg Collecta*. Vol. 2, Stockholm.
- BOHEMAN, C. H. 1858. *Eugenies Resa . . . 1. Coleoptera*. Norstedt, Stockholm.
- CAMBEFORT, Y. 1978. Canthonina nouveaux ou peu connus d'Afrique continentale (Coleoptera: Scarabacidae). *Journal of the Entomological Society of Southern Africa* **41** (2): 199-213.
- CASTELNAU, L. 1840. *Histoire naturelle des insectes coléoptères*. Vol. 2 Paris.
- FABRICIUS, J. C. 1775. *Systema Entomologiae . . . Korte, Flensburgi et Lipsiac*.
- FABRICIUS, J. C. 1794. *Entomologia Systematica*. Vol. 4. C. G. Proft, Hafniae et Copenhagen.
- FERREIRA, M. C. 1964. Contribuição para o estudo do género *Epirinus* Reiche (Col. Lamellicornia). *Novos Taxa Entomológicos* **37**: 1-13.
- FERREIRA, M. C. 1969. Os escarabéidos de Africa (Sul do Sáara). I. *Revista de Entomologia de Moçambique* **11**: 5-1088.
- GILLET, J. J. E. 1911. Scarabacidae: Coprinae I. *Coleopterorum Catalogus* Eds. W. Junk & S. Schenkling. W. Junk, Berlin.
- HAROLD, E. VON. 1880. Einige neue Colcopteren. *Mitteilungen der Münchener Entomologischen Gesellschaft* **4**: 152.
- JANSSENS, A. 1938. Scarabacini, Coleoptera Lamellicornia, Fam. Scarabacidae. *Exploration du Parc National Albert. Mission G. F. de Witte (1933-1935). Fascicle* **21**: 1-76.
- LACORDAIRE, J. T. 1856. *Histoire naturelle des insectes. Genera des Coléoptères: Pectinicornes-Lamellicornes*. Vol. 3. Roret, Paris.
- OLIVIER, A. G. 1789. *Entomologie ou histoire naturelle . . .* Vol. 1, Baudouin, Paris.
- PÉRINGUEY, L. 1901. Descriptive catalogue of the Coleoptera of South Africa (Lucanidae and Scarabacidae). *Transactions of the South African Philosophical Society* **12**: 1-920.
- REICHE, M. 1841. Tableau d'une division systematique de la tribu des Coprophages dans la famille des Lamellicornes. *Revue et Magazin de Zoologie, Pure et Appliquee* **4**: 211-212.
- THUNBERG, C. P. 1818. Coleoptera Capensia antennis lamellatis, sive clava fissili instructa. *Mémoires de l'Academie de St. Petersburg* **6**: 395-450.
- WIEDEMANN, C. R. W. 1823. *Zoologische Magazin*. Vol. 2, Part 1. Akademische Buchhandlung, Kiel.

Accepted 14 May 1986