
ANNALS OF THE TRANSVAAL MUSEUM ANNALE VAN DIE TRANSVAALMUSEUM

Volume
Band 34

July 1988 Julie

Part
Deel 22

A NEW SPECIES OF *LEICHENUM* DEJEAN (COLEOPTERA: TENEBRIONIDAE) FROM THE SOUTHWESTERN CAPE, AND NEW RECORDS OF THE GENUS FROM SOUTHERN AND EASTERN AFRICA

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Penrith, M.-L., 1988. A new species of *Leichenum* Dejean (Coleoptera: Tenebrionidae) from the southwestern Cape, and new records of the genus from southern and eastern Africa. *Annals of the Transvaal Museum* 34(22): 535-543.

A new species, *Leichenum capensis*, is described from the Olifants River, southwestern Cape Province, South Africa. The species *Leichenum granulatum* Penrith and *L. endroedyi* Penrith, described from the northern Namib, are recorded from East Africa. The distribution of *L. canaliculatum variegatum* Klug in southern and eastern Africa is mapped.

INTRODUCTION

Recent collecting has contributed greatly to our knowledge of the genus *Leichenum* Dejean in southern Africa. Before my previous paper (Penrith, 1984), *Leichenum* was known in southern Africa from isolated records of the very widespread subspecies *Leichenum canaliculatum variegatum* Klug from Lourenço Marques (now Maputo) on the eastern southern African coast, and 'Cap' (Gridelli, 1939). Gridelli recognized six species of *Leichenum*, four of which were known from the African continent. Ardoin (1965) described two further species, *L. bomansi* and *L. katanganum*, from central Africa (Zaire). Penrith (1984) described two new species, *L. granulatum* and *L. endroedyi*, and a new subspecies, *L. katanganum namibensis*, from the northern Namib desert, and listed further records of *L. canaliculatum variegatum* from the northwestern Kalahari.

In the present paper an eleventh species of *Leichenum* is described from the southwestern Cape Province. Further records of the two species described by Penrith (1984) are noted. These indicate that both species, like *L. katanganum*, have a trans-tropical African distribution. Finally, the southern and eastern African distribution of the widespread *L. canaliculatum variegatum* is mapped according to records in the Transvaal Museum, the National Collection of Insects, Pretoria, the South African Museum, Cape Town, and the Albany Museum, Grahamstown. The South African Museum and Albany Museum records were kindly supplied to me by

Dr F. W. Gess of the Albany Museum, whose coastal dune collection project has yielded new records of this interesting beetle. A modified and updated version of the key given by Penrith (1984) is given below.

KEY TO THE AFRICAN SPECIES AND SUBSPECIES OF *LEICHENUM*

1. Infraocular antennal sulcus well developed, with sharp inner edge 2
- Infraocular antennal sulcus indistinct, faintly impressed anteriorly only 7
2. Inner apical angle of protibia with a tooth, at least in male; outer angle of protibia greatly produced, apical margin of protibia about half length of inner margin 3
- Inner apical angle of protibia inermous, although the inner margin above it may be variously modified in males; outer apical angle of protibia somewhat produced, but apical protibial margin clearly less than half length of inner margin 4
3. Metasternum of male with short median longitudinal carina, sometimes reduced to a minute tubercle; apices of female elytra narrowed and produced *chissadoni* Chatanay
- Metasternum of male with faint median sulcus; elytra rounded apically in both sexes *muelleri* Gridelli
4. Inner edge of protibia of male with a narrow, deep, preapical incision (Fig. 1a); North Africa, Europe *pulchellum* Lucas
- Inner edge of protibia inermous in both sexes 5
5. Setae of pronotal lateral margins moderate to long, clearly longer than scales of pronotum 6
- Setae of pronotal lateral margins very short, not or scarcely longer than scales *endroedyi* Penrith
6. Outer edge of protibia with some sharp denticles; carina on middle of frons usually distinctly raised; setae of sides of pronotum moderately long *canaliculatum variegatum* Klug
- Outer edge of protibia with blunt denticles; carina on middle of frons reduced to a faint line; setae of sides of pronotum long *bomansi* Ardoin
7. Inner edge of protibia inermous in both sexes; tropical Africa 8
- Inner edge of protibia of male with large, square outgrowth before inner apex (Fig. 1b); southwestern Cape *capensis* spec. nov.
8. Denticles of outer edge of protibia sharp; pronotal seta-bearing granules small, inconspicuous *katanganum* Ardoin
- Denticles of outer edge of protibia blunt; pronotal seta-bearing granules large, conspicuous *granulatum* Penrith
9. Scaly vestiture of dorsal surface unicolorous, white *katanganum katanganum* Ardoin
- Scaly vestiture of dorsal surface patterned, beige, dark brown, and white scales present *katanganum namibensis* Penrith

DESCRIPTION OF NEW SPECIES

***Leichenum capensis* spec. nov.**, Figs 1, 2, 3.

DIAGNOSIS. Inner margin of protibia of male with a rectangular outgrowth (Fig. 1b) just above inner angle, which is without tooth; denticles of outer protibial edge rounded apically. Frons with a fine median carina at least at median scaleless line; clypeus with a crescentic median apical excavation, deeper in males. No distinct infraocular antennal sulcus. Antennae with distinct scales on the first 4–5 segments. Seta-bearing granules of pronotum small, but conspicuous; lateral pronotal setae moderately long.

DESCRIPTION. Total length 3.5–4.5 mm. Integument brown, covered with mainly pale scaly vestiture with a variable pattern of dark spots.

Frons with a fine median carina, or with a fine bare median line in some specimens. Clypeus in both sexes with a shallow median crescentic emargination; anterior lobes broadly rounded, apically reflected. Frons and clypeus covered with small white to beige scales, interspersed with erect and semi-erect, backwardly directed broad yellowish scale-like setae that emerge from small round granules. No distinct infraorbital antennal sulcus. Ventral surface of head with small scales, integument visible between them; gula bare, shiny. Antennae about as long as head width between eyes, or a little shorter, with fine scales on the first 5-6 segments, last four segments enlarged, forming a club.

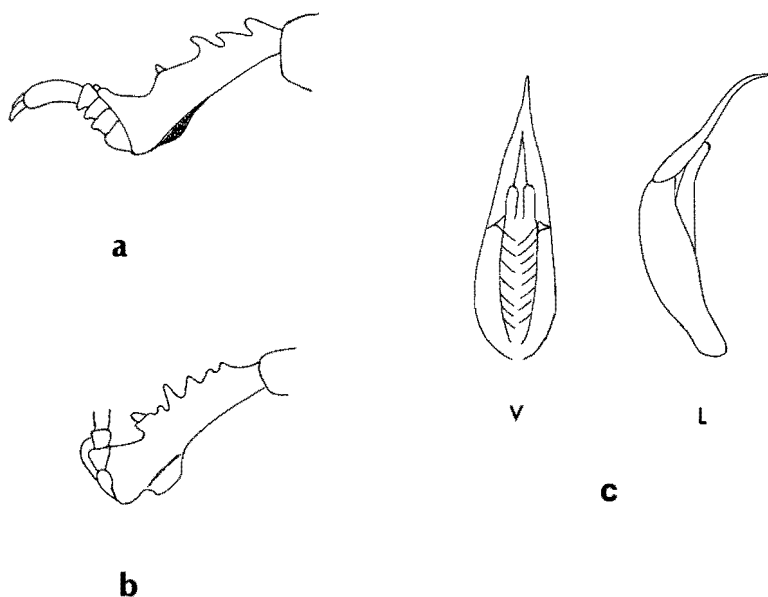


Fig. 1. a: *Leichenum pulchellum* Lucas, male protibia. b: *Leichenum capensis* spec. nov., male protibia. c: *L. capensis* spec. nov., aedeagus: V = ventral, L = lateral view.

Pronotum a little less than twice as wide as long (length-width ratio 5:8), greatest width just in front of middle. Anterior lobes broadly obtuse; anterior margin between them bisinuate. Sides evenly rounded from anterior angle to small incision before posterior angle, serrate. Posterior angles acute. Base bisinuate. Disc evenly convex except for a pair of deep basal impressions opposite fifth elytral costa; no postocular or median impressions. Surface covered with small overlapping scales, white or light-coloured except for two dark spots at the basal impressions and, in most specimens, a pair of dark postocular spots anteriorly. The middle of the disc may be shaded darker than surrounding areas. Vestiture interrupted by evenly scattered small round granules bearing semi-recumbent to recumbent broad yellowish scale-like setae, relatively short, about as long as distance between granules. Scale-like setae of lateral and posterior margins longer, one and a half times to almost twice length of discal setae.

Scutellum somewhat variable in width, sides straight, apical margin weakly rounded; covered with small, dark brown scales. Elytra about as wide as pronotum,

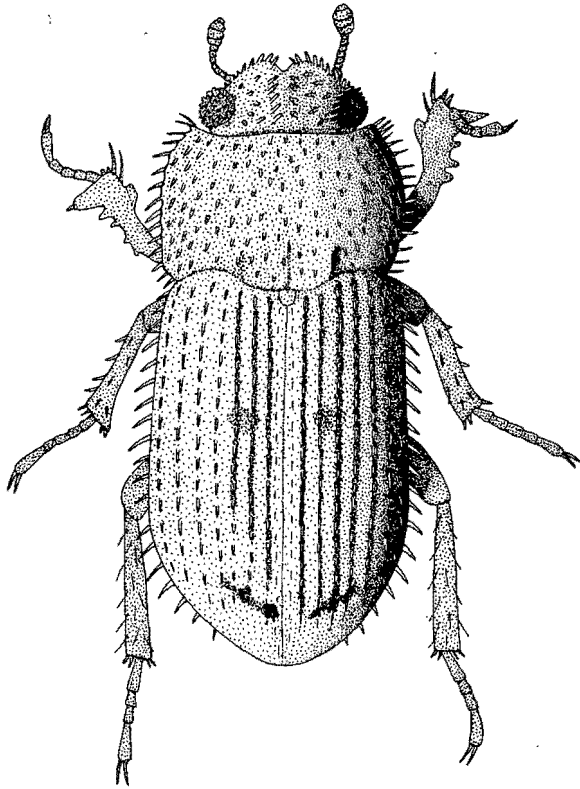


Fig. 2. *Leichenium capensis* spec. nov., male.

with nine costate rows, each with a median row of minute granules bearing semi-recumbent scale-like setae a little longer than those of pronotal disc, those of the ninth costa much longer. Costae evenly raised, ninth slightly more prominent posteriorly. Intercostae formed by primary rows of foveate scale-filled punctures, about half width of costa, punctures in each row separated from one another by a space equal to diameter of puncture. Scaly vestiture of elytra pale, with a variable mottling of brown spots or elongate patches; these are generally surrounded, and sometimes joined to one another by shaded patches. Pseudopleural crest ventral, similar to elytral costae but granules larger and setae longer, generally much longer than those of ninth row, at least anteriorly. Pseudopleura narrow, evenly scaly. Apices of elytra broadly rounded in both sexes.

Prosternum in front of procoxa about as long as procoxa; apophysis deflected behind coxae, apex meeting mesosternum. Prosternum and proepisterna covered with white or light-coloured scales, a little longer than those of dorsal surface, some on the prosternum very long and erect. Mesosternum bilevelled, apophysis a little narrower than mesocoxa; anterior part with even, dense small scales, raised posterior part with long, erect and semi-erect scale-like setae arising from rather dense round granules. Metasternum with rather long scale-like setae like those of posterior part of mesosternum in female, middle of metasternum of male with long, finer setae.

Abdomen not dimorphic except for vestiture, which is similar to that of metasternum; intercoxal process rounded.

Protibia dimorphic: male with a large rectangular outgrowth on inner edge in proximal third (Fig. 1b). Both sexes with outer distal angle produced, bluntly subdentiform, apical edge comb-like; outer protibial margin with 5–6 blunt denticles, increasing in size distally, each bearing a short apical spine that is often abraded. Meso- and metatibiae subcylindrical, straight. Protarsal segments normal, subcylindrical, not dimorphic. Legs with even vestiture of small elongate scales, leaving integument exposed between them.

Aedeagus (Fig. 1c): apex of tegmen narrow, tapering, curved ventrad; median lobe apically bilobed.

MATERIAL EXAMINED. Holotype: ♂, total length 3.6 mm (TM), S. Afr., Cape-Cedarbg, Olifants R., Boshof, 32.20 S–18.59 E, 20.8.1983, E-Y:1951, shore washing, leg. Endrödy, Penrith. Allotype ♀: total length 4.2 mm (TM), locality, date, and collectors as holotype, but E-Y:1953, sand banks, river. Paratypes: 8 ♂, 6 ♀: 7 ♂, 5 ♀ (TM), data as allotype; 1 ♂ (SMW), Olifants R., 21 km N. Citrusdal turn off at SE 3218 Bd, 14 Mar. 1973, H 12305, leg. M.J. & M.-L. Penrith; 1 ♀ (SAM), Hex Riv., Dec. '83 [1883].

DISTRIBUTION (Fig. 3). Southwestern Cape.

REMARKS. The present species differs from all previously known species of *Leichenum* in the form of the male protibia. Dimorphism of the protibia occurs also in *L. pulchellum*, in which the inner margin of the protibia is incised in males (Fig. 1a). *L. pulchellum* is further differentiated from *L. capensis* by the well-developed antennal sulcus, pronotum with postocular, median, and prebasal as well as basal impressions, shorter lateral pronotal setae, and non-reflected anterior clypeal lobes. From the other species lacking an antennal sulcus, *L. katanganum* and *L. granulatum*, *L. capensis* differs in the dimorphic protibia; it differs further from *L. granulatum* in the smaller pronotal granules and the smaller and more widely spaced foveate elytral punctures, and from *L. katanganum* in the shorter, more numerous and blunter denticles of the protibial margin, and the shorter lateral pronotal and elytral setae.

The name is derived from the region in which the type locality occurs.

NEW RECORDS OF SPECIES OF *LEICHENUM* IN SOUTHERN AND EASTERN AFRICA

The records of the species listed below are plotted in Figs 3, 4.

Leichenum canaliculatum variegatum Klug (Fig. 4)

SOUTH AFRICA AND TRANSKEI: Alexandria, Langebos (SE 3326 Cb); Algoa Bay (SE 3325 Dc); Amsterdamhoek (SE 3325 Dc); Boknes (SE 3326 Da); Brenton-on-Sea (SE 3423 Aa); Bushman's River Mouth (SE 3326 Da); Cints East (20 km NE East London) (SE 3228 Cc); Dukuduku forest (SE 2823 Ad); Durban (SE 2913Cc); Dwesa, coast (32.17 S, 28.51 E); Empangeni (SE 2831 Db); Enseleni (SE 3129 Ab); George (SE 3322 Cd), Bothastrand (34.03 S, 22.18 E); Hluhluwe (28.01 S, 32.16 E); Isipingo (SE 3030 Bb); Jeffrey's Bay (SE 3424 Bb); Keurboms River (SE 3322 Dd); Kosi Bay (26.59 S, 32.50 E); Kowie (Port Alfred) (SE 3326 Db); Kwa Mnyalsa (SE 2732 Cb); Maitland River Mouth (SE 3325 Cd); Malvern, Natal (2930 Dd); Mkuze (2732 Ca); Mmabolela Estate (22.40 S, 28.15 E); Mogol Nature Reserve, Ellisras (23.58 S, 27.45 E); Mossel Bay (SE 3422 Aa); Mposa (SE 2832 Ca); Mseleni Mission (27.23 S, 32.32 E); Mtunzini (SE 2831 Dd); Olifants Camp, Kruger National Park (SE 2331 Dc); Port Alfred (SE 3326 Db); Port Elizabeth (SE 3325 Dc); Port St Johns (SE 3129 Da); Richards Bay, nr (28.25 S, 32.15 E); Roodeplaat (2528 Ca); St Lucia (SE 2832 Ad); St Michaels (SE 3030 Ab); Sandflats (SE 3325 Ba); Sardinia Bay (SE 3425 Ba); Sibaya (SE 2732 Bc); Sodwana Bay (27.32 S, 32.40 E); Tongaat (SE 2931 Ca); Umdhloti (SE 2931 Ca); Umhlali (SE 2931 Ca); Umhlanga Rocks (SE 2931 Ca); Van Staden's Pass (3325 Cc);

Warmbaths (SE 2730 Db); Wilderness (3322 Dc). SOUTH WEST AFRICA/NAMIBIA: Andana Bagani (= Bagani) (18.07 S, 21.37 E); Kwando River at 17.47 S–23.20 E; Oshikango (SE 1715 Bd); Popa Falls (SE 1821 Ba); Tondoro (17.45 S, 18.47 E). BOTSWANA: Thamalakane River (20.08 S, 23.23 E). ZIMBABWE: Mt Selinda (20.24 S, 32.43 E). ZAMBIA: Mongu (15.13 S, 23.09 E). MOZAMBIQUE: Beira (19.49 S, 34.52 E); Chemba (17.11 S, 34.53 E); Delagoa Bay (SE 2532 Dc); Impaputo (not traced); Inhaca Island (26.01 S, 32.58 E); Lourenço Marques (= Maputo) (25.58 S, 32.35 E); Quelimane (17.53 S, 36.51 E); Vilanculos (22.01 S, 35.19 E). MALAWI: Banana Boma (not traced); Fort Johnstone (14.29 S, 35.14 E); Zomba (15.22 S, 35.22 E). TANZANIA: Dar-es-Salaam (06.51 S, 39.18 E); Ukerewe Island (20.09 S, 32.52 E). ZAIRE: Ngowa, Kwango (05.41 S, 16.36 E). KENYA: Kalin, N. Turkana (04.22 N, 35.33 E); Kitui (SE 0138 Ac); Lake Baringo (00.38 N, 36.17 E); Mombasa (04.04 S, 39.40 E); Mutha (01.47 S, 38.26 E); Thowa River (SE 0138D-). MADAGASCAR: Fenerive (17.21 S, 49.25 E); Maroantsotra (15.23 S, 49.44 E); Moromanga (not traced). MAURITIUS. Not traced: Kative; Kawa Forest; Sekoke.

Leichenum endroedyi Penrith (Fig. 3)

This species was described from Ehombe Mt in the Kaokoveld of northern South West Africa/Namibia (Penrith, 1984). A series of seven specimens in the Transvaal Museum from Kitui, Kenya (01.22 S, 38.01 E) agrees in all details with the specimens from western southern Africa.

Leichenum granulatum Penrith (Fig. 3)

The following specimens in the Transvaal Museum have been assigned to this species, which was described from southern Angola (Penrith, 1984): (6) Thowa R., Kenya, (1) Kitui, Kenya.

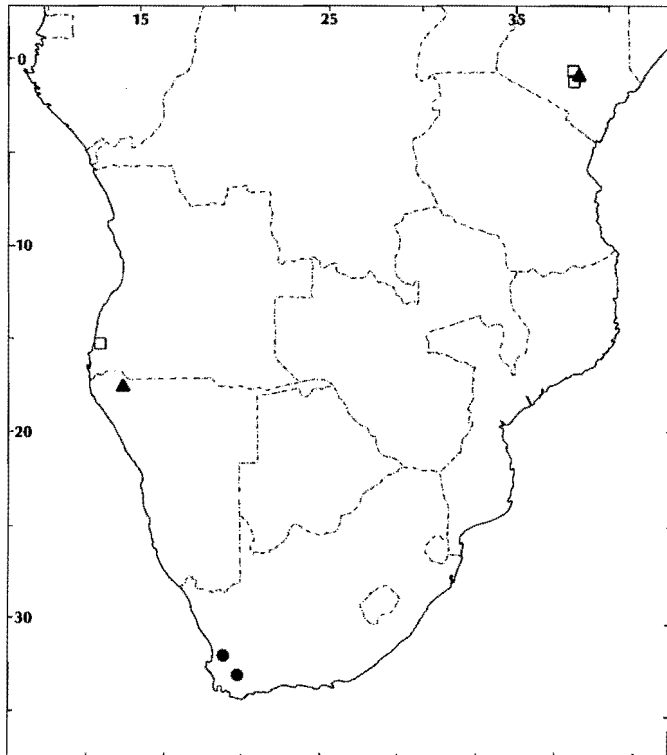


Fig. 3. Distribution of *Leichenum capensis* spec. nov. (solid circles), *L. endroedyi* Penrith (solid triangles), *L. granulatum* Penrith (open squares).

These specimens differ from the Angolan types only in having a faint pattern on the clytra, the Angolan ones being unicolorous. This colour difference is similar to, but less striking than, that between the subspecies of *L. katanganum*.

DISCUSSION

The members of the genus *Leichenum* are small and inconspicuous. It appears to be the rule rather than the exception that the species are very widespread. They are usually to be found in dry white sand close to water courses. Dr F. W. Gess of the Albany Museum, Grahamstown, has kindly allowed me to quote the following observations: 'In all cases the beetles were found in loose dry sand beneath pioneer plants growing on beaches and on and between low dunes. Most commonly they are found beneath *Arctotheca populifolia* but do occur also under other species, though less frequently. Depending upon the time of day they may be found on the surface of the sand where their cryptic markings and colouration/sculpture of their dorsal surfaces allow them to blend well with the sandy background' (F. W. Gess, personal communication, 25 April 1985). The specimens of *L. capensis* from the Olifants River were collected on sand banks at the base of reed clumps some distance above water level. *L. canaliculatum* as recorded from the northern Kalahari by Penrith (1984) was collected under similar conditions, while *L. katanganum namibensis* was collected under dune grasses along old water courses (Penrith, 1984). A large amount of the material examined was collected at night.

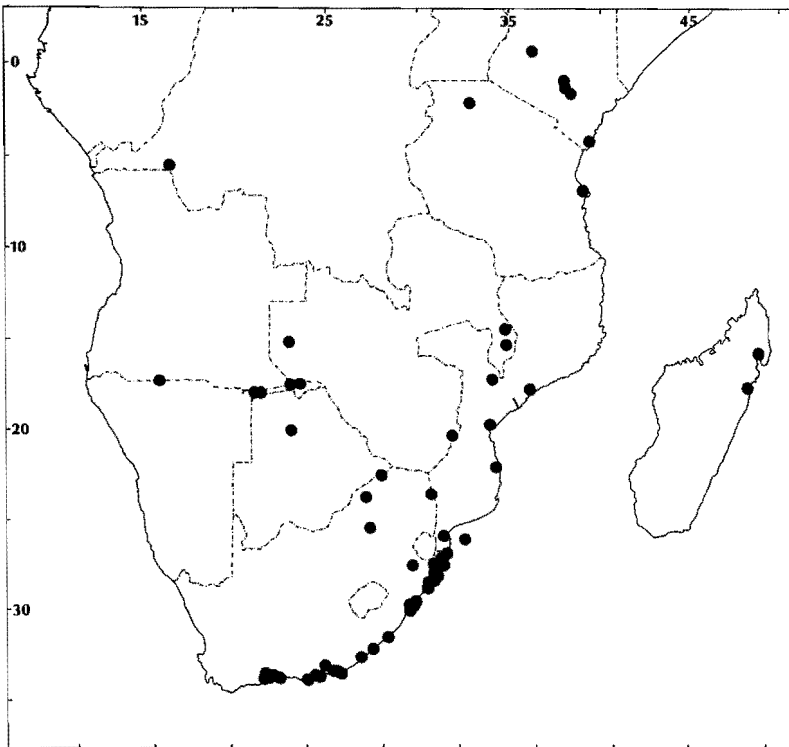


Fig. 4. Distribution records of *Leichenum canaliculatum variegatum* Klug in subequatorial Africa and Madagascar.

The occurrence of these beetles along beaches and water courses has presumably facilitated their distribution. A detailed study of the group would undoubtedly be extremely interesting from an historic-biogeographical point of view, but it is likely that a great deal more collecting will be necessary before an accurate picture could emerge. At present it would be difficult to draw any conclusions about the relationships of the species and their distribution. However, a certain amount of preliminary discussion may be appropriate at this stage.

The Leichenini are distinguished from the Opatrini by the possession of ocular scales, short antennae with a four-segmented club, and a unipartite tegmen of the aedeagus. Their tribal status is questionable from a cladistic point of view, since it is unlikely that an apomorphy unshared by Leichenini could be found for the Opatrini, and of the three apomorphies listed above defining Leichenini, only the unipartite aedeagal tegmen appears to be valid. The ocular scales are not unique in Leichenini among the Tenebrionidae, since they occur in such widely separated tribes as Drosochrini and Cryptochilini, and also occur in other families, e.g., Dasytidae, Colydiidae. The four-segmented antennal club may be observed in various Opatrini.

Certain opatrine genera such as *Ammodonus* resemble the Leichenini strongly in general habitus, and the removal of the species *verrucosum* Fairmaire from *Leichenum* by Gridelli (1939) has left that species without a genus; its appearance is strongly intermediate between Opatrini and Leichenini. These problems will be solved only when the knowledge of Tenebrionidae has expanded to the point where higher classification in the tribe can be studied from a truly reliable date base.

The fused basale and apicale of the aedeagal tegmen of Leichenini indicates that the Leichenini are apomorphic relative to Opatrini. It is thus possible to use Opatrini as an outgroup for comparison with Leichenini. As indicated above, present knowledge of *Leichenum* is not sufficiently extensive for a serious consideration of relationships within the genus, but the evidence so far available is presented.

The four northern species *Leichenum pictum*, *L. mucronatum*, *L. muelleri* and *L. chissadoni* form a distinct group, with the inner apical angle of the protibia produced and dentiform. The form of the protibial dimorphism of *L. pulchellum* differs so much from that of *L. capensis* (Fig. 1a, b) that it does not necessarily indicate close relationship, and it is likely that *L. capensis* is more closely related to *L. granulatum* and *L. katanganum*, also lacking a postocular antennal sulcus, than to the other species, which, in addition to the antennal sulcus, have a distinct postocular impression in the pronotum, which is weak to absent in *L. katanganum*, *L. granulatum* and *L. capensis*. Antennal sulci and postocular pronotal impressions do not occur in *Microleichenum*, *Ammodonus* or in Opatrini in general, and this suggests that they may be apomorphic developments. All the species with a well-developed postocular antennal sulcus except *L. endroedyi* and *L. bomansi* are known from the northern hemisphere. If the assumption that the antennal sulcus and impressed pronotum are apomorphic developments in *Leichenum* is correct, then the three species which lack them might be representatives of an earlier lineage, suggesting a southern or central African origin for the group. However, if the loss of an antennal sulcus and pronotal impressions are secondary reductions, then *L. capensis*, *L. katanganum* and *L. granulatum* may represent a relatively young, southern Ethiopian lineage, and the origin of the group could lie in either the northern or the southern hemisphere. This fascinating problem can be solved only by more complete collection of the group and a greatly increased knowledge of the Opatrini.

ACKNOWLEDGEMENTS

I am grateful to Dr F. W. Gess of the Albany Museum, Grahamstown, for his contribution to the knowledge of *Leichenum* in South Africa and the kind way in which he has made his information available to me; to Mr Rolf Oberprieler of the National Collection of Insects, Pretoria, for the loan of material; and to Dr Sebastian Endrödy-Younga, my colleague at the Transvaal Museum, for support at all stages of the project, including a pause for collecting in an appropriate area along the Olifants River.

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