

NEW AND LITTLE KNOWN SCORPIONS AND SOLIFUGES FROM THE NAMIB DESERT AND SOUTH WEST AFRICA

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(With 5 figures)

The following contribution, which represents a description of new or little known scorpions and solifuges from various parts of the S. W. African territory, demonstrates how inadequately the arachnid fauna of the region is known, even in the case of such large bodied orders as scorpions. The most interesting recent discovery is a new species of scorpion, *Uroplectes teretipes*, from the Skeleton Coast, very different from any others belonging to this genus and characterised by great elongation of the legs and pedipalps, somewhat like that displayed by many dune inhabiting tenebrionid beetles. This is the fourth species of *Uroplectes* found living in the Namib littoral.

My sincere thanks are due to the following collectors who have shown their interest in the Arachnida by contributing materials and observations: Dr. Charles Koch of the Namib Desert Research Station, Mr. W. D. Haacke of the Transvaal Museum, Mr. F. Gaerdes of Okahandja and Dr. W. G. H. Coaton of the Division of Entomology, Plant Protection Research Institute, Pretoria.

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SCORPIONS

Family BUTHIDAE

Genus UROPLECTES Peters

UROPLECTES TERETIPES sp. n.

Figs. 1, 2, 2a

Holotype, 1 ♀ (NM. 9101), near Rocky Point, 300 yards from the beach, mouth of the Hoarusib River, Kaokoveld, S. W. Africa; collected by F. Gaerdes, October 1965.

Colour. Trunk dorsally very pale yellow brown, only the ocular tubercle black, ventrally pale yellow; appendages pale yellow; tail pale yellow except segments III and IV which are black, contrasting strongly with the remainder of the animal, apical half of aculeus brown, but remainder of vesicle pale yellow, caudal segment II with some obscure blackish markings appearing as narrow lines outlining the keels on the ventral surface, Fig. 2.

Carapace anterior to ocular tubercle weakly shagreened, posterior to ocular tubercle with larger but still minute scattered dust-like granules, ocular tubercle smooth, the eyes separated by more than twice their diameter.

Tergites shagreened in anterior halves, dust-like scattered granules on posterior halves, median keels strong but lateral keels represented only in V and VI by an enlarged granule on each side on the posterior margin; last tergite with 4 long distinct crests; sternites smooth, shiny, the last with distinct lateral keels, the median ones obsolete.

Cauda. Dorsal keels obsolete except in segment I, ventral keels present but smooth, not granular, except in V; segments IV and V entirely smooth laterally; vesicle small and slender, the aculeus equal in length to bulb, entirely smooth without vestige of tooth or tubercle inferiorly; all caudal segments and vesicle with sparse, short hairs.

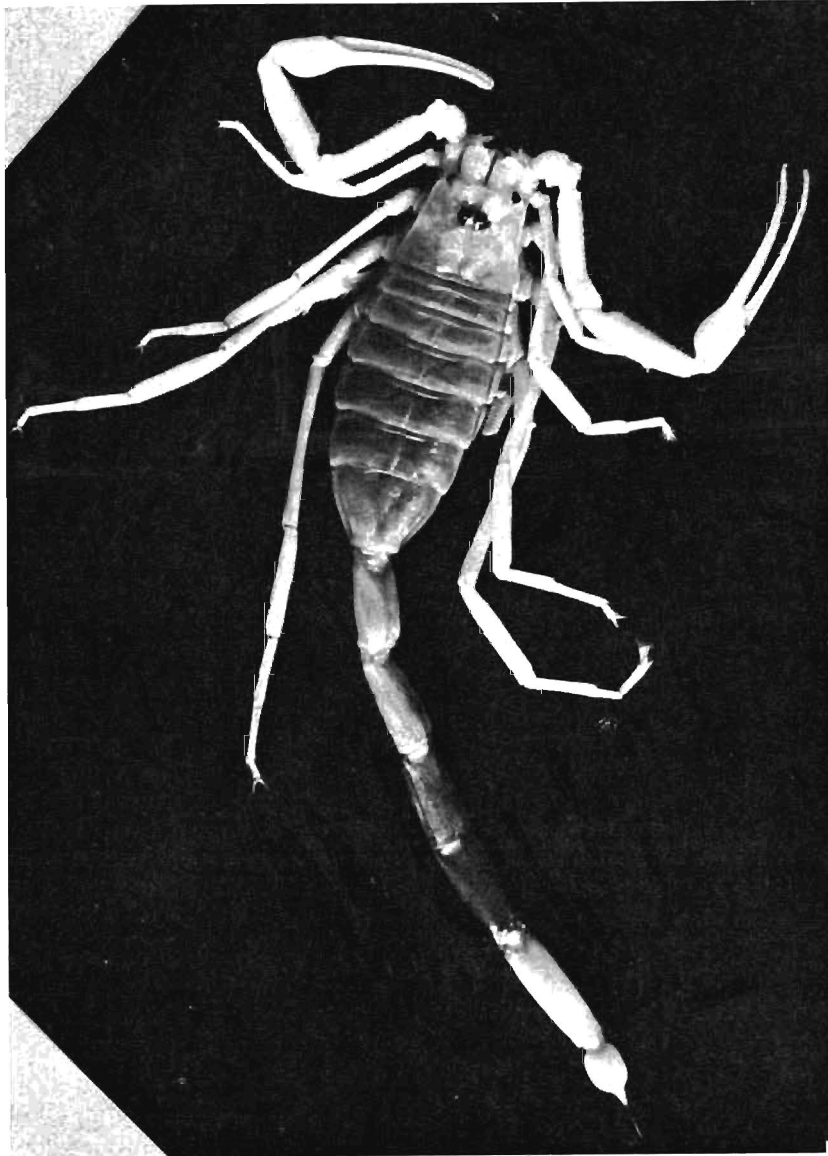


FIGURE 1. *Uroplectes teretipes* sp. n.: Dorsal view of the female holotype (photo L. Kelsall).

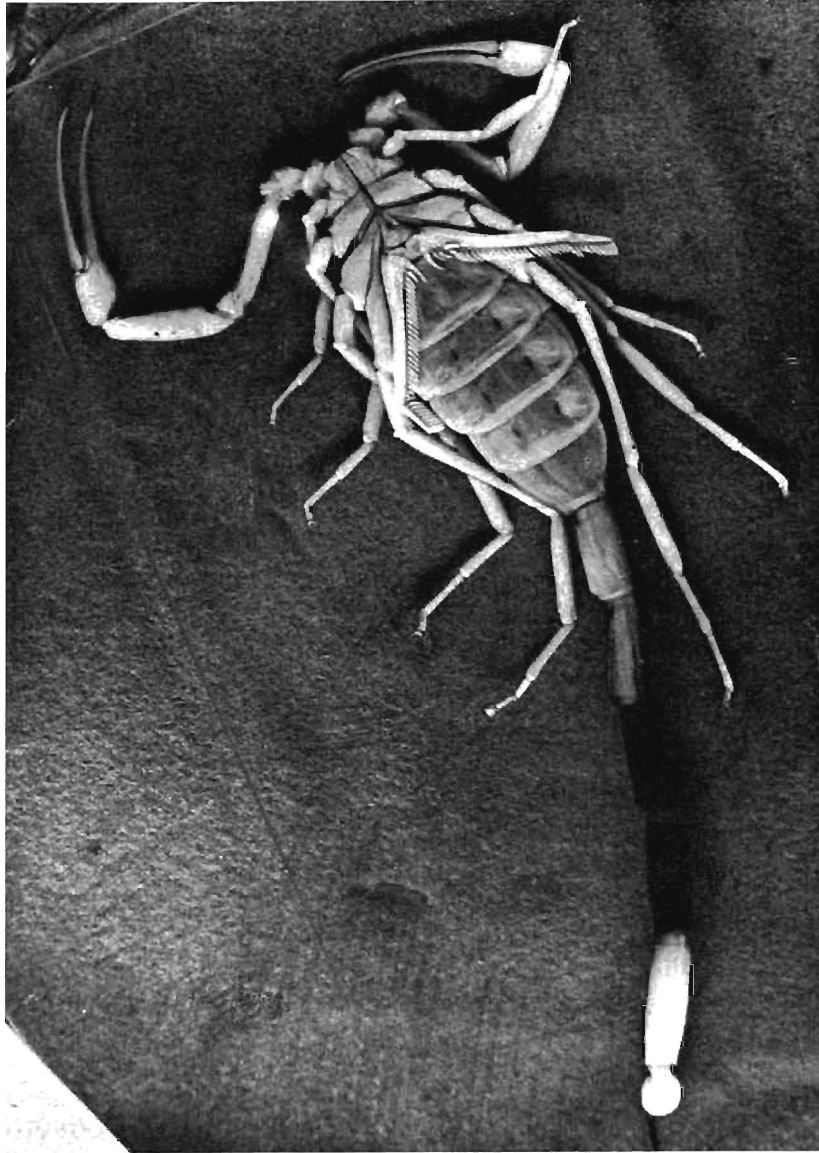


FIGURE 2. *Uroplectes teretipes* sp. n.: Ventral view of the female holotype (photo L. Kelsall).

Pectines very long, extending outwards well beyond the body, 37—38 teeth, the first one enlarged as in *planimanus* but longer and rather less curved, almost twice as long as the teeth in the middle of the comb, Fig. 3a.

Pedipalp very elongate, when pressed back reaching to about the middle of first caudal segment; hand short, about a fourth length of movable finger, not flattened above or with a sharp inner edge, hardly wider than widest part of brachium; movable finger about $1\frac{3}{4}$ length of carapace or equal to caudal segment V and $\frac{2}{5}$ of IV; arrangement of granules on cutting edge of fingers as in *planimanus* but 10 distinct rows instead of 9.

Legs. All legs elongate, especially the posterior ones; leg IV (39 mm) a little shorter than length of entire tail, or equal to trunk plus caudal segments I, II and $\frac{1}{3}$ of III.

Dimensions: Trunk 23.5, tail 41, length of carapace 6.4, width 7.2, pedipalp 28.5; hand back 3.7, movable finger 10.8; leg IV 39 mm.

Remarks. The species differs completely from any other form of *Uroplectes* found in Southern Africa, with a far larger number of pectinal teeth than any known species; the nearest resemblances seem to lie with *planimanus* in the arrangement of the granules of the cutting edge of movable finger and the shape of the enlarged basal pectinal tooth (fig. 3b). It differs markedly from this species in the greatly elongated legs and pedipalps, the slender habitus in general, the colouring, the large number of pectinal teeth, the much narrower hand without a flattened upper surface or fairly sharp inner edge. Males of *Uroplectes* are usually considerably more slender than the females and the male of this species, when found, should prove to have an excessively elongate and slender habitus. This is the fourth species of *Uroplectes* occurring in the litoral of S. W. Africa, another instance of the excessive speciation, which has taken place in this region.

Although it would seem likely from a geographical viewpoint that this scorpion would be the same as *U. pilosus* (Thorell), of which the Transvaal Museum has specimens of both sexes from Cape Cross, it is not even related to this rare species, found only about 200 miles to the south and on the same barren coast. The following is a brief supplementary description of *U. pilosus* (Thorell).

UROPLECTES PILOSUS (Thorell)

Lepreus pilosus Thorell 1877, Act. Soc. Ital. Sci. Nat., 19, p. 118.

Colour uniformly yellow without markings, vesicle and caudal segment V of the δ a little darker, light yellow brown.

The pilosity of the species in both sexes is its most striking character, especially on caudal segments I—IV and the last sternite, the fingers and hand of the pedipalp. Lateral crests of the tergites distinct except in the anterior ones, much more so than in *teretipes*.

Caudal segments with the median keels of the ventral surface absent, but the lateral keels well defined; superior crests of segments I—III well developed with shiny rows of granules, the last granule in each enlarged and tooth-like, larger in the δ than in the φ ; segment V covered entirely with a shagreen of fine granules, finer and very dense in the δ , the inferior surface with 3 well defined granular crests; vesicle below and at the sides with scattered granules, larger and stronger in the δ ; vesicle distinctly wider than segment V in the φ , subequal in the δ , its ventral surface somewhat flattened (more distinctly so in the φ). Tail distinctly longer in proportion to body length in the δ .

Pedipalp. The hand a little wider than the brachium; movable finger with 9 complete rows of granules, as in *planimanus* (10 in *teretipes*, 11 in *otjimbinguensis*).

Pectinal teeth: δ , 30—31; φ , 28—29, the basal tooth oval, much wider than the others, not longer than the middle teeth of the pectine, in general resembling that of the φ of *carinatus* and *otjimbinguensis*.

Dimensions. Total length of δ 54, tail 32; of φ total length 50, trunk 20.5 mm.

It thus differs from *teretipes* in pilosity, colour, number and shape of the pectinal teeth, granulation of the tail segments and in lacking the extreme attenuation of the appendages, which is so characteristic of that species.

The four species of *Uroplectes* found in the Namib of S. W. Africa are: *planimanus*, *pilosus*, *otjimbinguensis* and *teretipes*.

Family SCORPIONIDAE

Genus OPISTHOPHTHALMUS C. L. Koch

OPISTHOPHTHALMUS GIGAS HAACKEI subsp. n.

Holotype 1 φ (NM. 9105), Fish River Canyon, S. W. Africa, collected by W. D. Haacke.

Colour. Carapace reddish brown, interocular area yellow to orange; abdomen dorsally and ventrally blackish with olive green tinge, first sternite lighter; tail similar to abdomen, a little lighter towards apex, vesicle orange-yellow; legs yellow. Pedipalp reddish brown (a little darker than carapace), except hand which is yellow, contrasting strongly with the blackish-brown fingers.

Carapace with distinctly fewer and smaller granules than *gigas*, especially in the posterior half laterally, interocular area quite smooth; carapace comparatively quite wider than in *gigas*, only slightly longer than wide (in *gigas* distinctly longer than wide).

Tergites quite smooth except the last, which has fine dust-like granulation in the middle, the granules becoming larger and fewer laterally.

Tail in general much weaker, narrower, and relatively shorter than in *gigas*. In *gigas* the tail is subparallel seen from above, the first segment being but little wider than the others, while in the new subspecific form segment I is distinctly wider than all the others; median groove of the dorsal surface of segment V distinct throughout, but only in the anterior half in *gigas*; the vesicle smaller and weaker than in *gigas*.

Pedipalp. Posterior crest of upper surface of humerus with a regular subsidiary row of 7—8 granules just anterior and parallel to it. Although the form has a smaller body size than *gigas*, the hands are much larger, both in width and length, and more thickset, almost quite smooth above, the fingers considerably thicker and shorter as compared with the hand back, than in *gigas*.

Legs. Tarsi III and IV with 11 outer, 7—8 inner powerful spines; the superior lobes of these tarsi not reaching as far as the lateral lobes.

Pectinal teeth: 23—24.

Dimensions: Trunk 44.5, tail 46; width of carapace 17, length 18 mm. The greater size and strength of the hand as compared with *gigas* is illustrated by the following figures:

	Length of handback	Width of hand	Length of movable finger
<i>haackei</i>	14	11	18
<i>gigas</i>	11	9.5	17

Remarks. The species also has relationships with *brevicauda* Lawrence from the Kaokoveld and is perhaps a connecting form between it and *gigas*. It is named in honour of Mr. W. D. Haacke of the Transvaal Museum, who has collected so much valuable arachnid material in South West Africa.

OPISTHOPHTHALMUS CARINATUS

SCABRICEPS subsp. n.

Holotype 1 ♀ (NM. 9051), Welwitschia, S. W. Africa, collected by F. Gaerdes, January 1963.

Differing from the typical form of *carinatus* in the following particulars:

The anterior forked groove of the carapace indistinct, the median incision of the anterior margin very deep; granules at the sides larger and more

numerous, areas laterally to the ocular tubercle quite strongly granular, anterior portion of carapace mesially to the lateral eyes with a weak but quite distinct covering of small granules; thus almost the entire surface of carapace with some granules except a fairly small, more or less rounded area anterior to the ocular tubercle on each side of the median groove, which is quite smooth and shiny; last tergite more strongly granular, the granules at the sides in anterior half arranged in a series of 6—7 transverse ridge-like crests; all sternites quite smooth.

Keels on inferior surface of caudal segment II obsolete, but with 2 pairs of large pits; vesicle considerably larger, sides of caudal segment V almost entirely smooth, dorsal surface widely but shallowly grooved throughout its length. Upper surface of pedipalp hand slightly more convex, otherwise very similar to that of *carinatus histrio*.

Pectinal teeth: 19—19.

Dimensions: Trunk 53, tail 45; length of carapace 19, width 18; hand-back 12.5, width of hand 12.7, movable finger 18.5 mm.

In general the subspecies is more closely related to *carinatus histrio* than to *carinatus carinatus*.

Genus HADOGENES Kraepelin

HADOGENES TITYRUS (Simon)

Fig. 3c

Ischnurus tityrus Simon 1887, Ann. Soc. Ent. France, 6, p. 383.

Hadogenes tityrus Kraepelin 1908, in Schultze's Forschungsreise in Südafrika, I, Lief. 2, p. 268 (male).

2 ♀♀, 1 ♂ from the Lekkersing area, northern Cape Province, collected by W. D. Haacke, February 1962.

Simon's description of the species was based upon a ♀; in spite of the discrepancy in the number of pectinal teeth I have no doubt that the above material should be attributed to Simon's species; Kraepelin's abbreviated description of the male (loc. cit., p. 268) confirms this.

The species can be easily recognised by the following characters:

- There is little difference in the general appearance and size of the sexes, the tail being much shorter than the trunk.
- In both sexes the under surface of caudal segments II and V have rows of enlarged tuberculiform teeth; on II there are 4 rows, the two outer of 5, the two inner of 4; on V there are 3 rows of 3—5 tubercles.

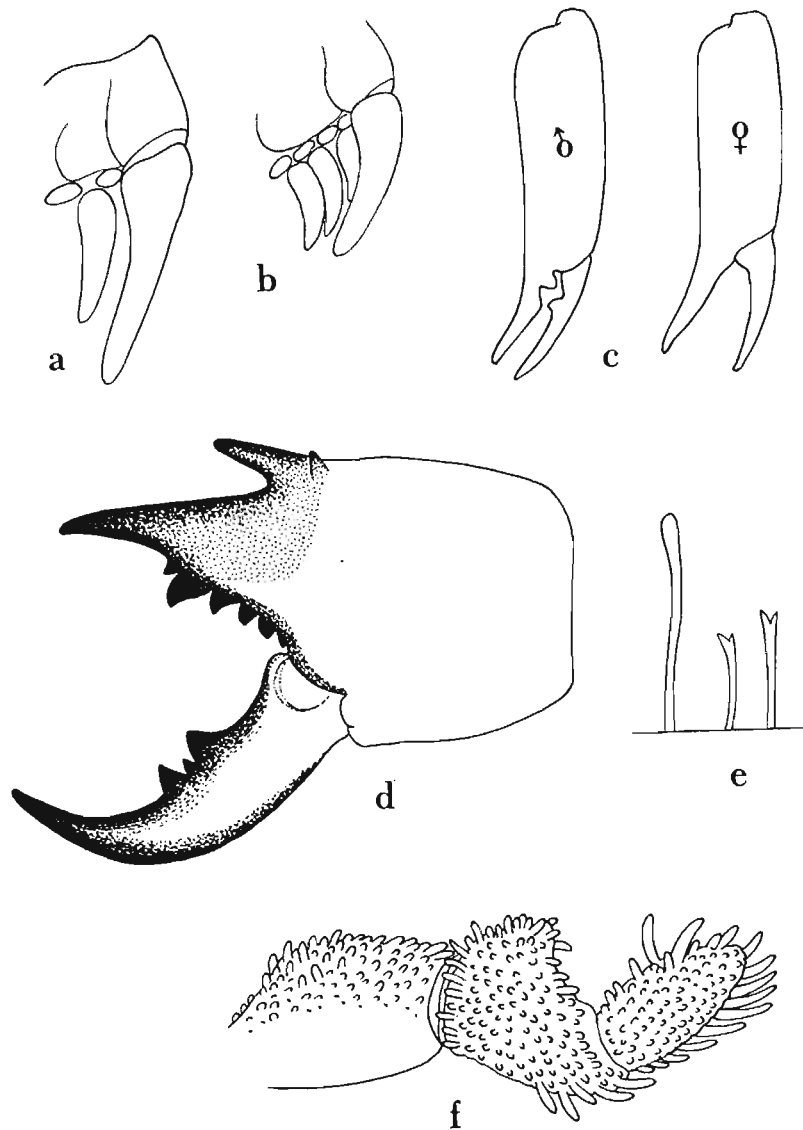


FIGURE 3. *a*, Basal tooth of pectinal comb of *Uroplectes teretipes* sp. n.; *b*, the same of *Uroplectes planimanus* Pocock; *c*, the outline of the hand of ♂ and ♀ specimens of *Hadogenes tityrus* (Simon); *d-f*, *Chelypus coatoni* sp. n. ♀; *d*, chelicera in lateral view; *e*, modified hairs of pedipalp tarsus; *f*, three distal segments of leg IV, ventral view.

- (c) In both sexes the vesicle is flattened from side to side, the lateral surfaces smooth, shiny, with coarse pits; in lateral view the inferior surface with numerous long, upstanding, wiry setae (not much shorter than the bulb of the vesicle).
- (d) Caudal segment III seen from the side very deep in both sexes, sloping upwards to the posterior apex which is sharply pointed though not in the form of an enlarged tooth or spine.
- (e) Hands very long and narrow, almost parallel sided but narrowing slightly distally, slightly wider in the ♀ than in the ♂; the fingers of the ♀ relatively a little longer than in the ♂, those of the latter bearing a large prominent lobe near the base, these structures completely absent in the ♀, Fig. 3c.
- (f) Humerus of pedipalp with its upper surface bounded anteriorly and posteriorly by a very regular row of 24 equal-sized, large round granules, the area between them depressed but quite flat, entirely covered with minute dust-like granulation.

The sexes can be distinguished by the following:

1. The presence or absence of lobes on the fingers of the hand, present on those of the male only in this species.
2. The last tergite in the ♂ is only a little, that of the ♀ much wider than long; that of the ♀ is quite smooth and shiny, ornamented with excavated symmetrical sculpturing, while in the ♂ it is shagreened with fine dust-like granulation and almost entirely lacks sculptured markings.
3. Pectinal teeth of ♀ 12—13, of ♂ 16—16; Simon's ♀ type had 9—10, while Kraepelin (1908, p. 268) when recording the species from Kubub, S. W. Africa, mentions that the ♂ has „in der Regel 13—15 Kammzähne“.

Dimensions: ♂. Total length 74 (tail 30), carapace length 10.5, width 10.5, mm. ♀. Total length 75 (tail 27), carapace length 11.2, width 11.2 mm.

Additional material. 1 ♂, Tiras Mts., S. W. Africa, collected by W. D. Haacke, May 1963.

This is a very distinctive species differing in its small size and short tail from all others of the genus; as pointed out by Hewitt it is also a very primitive one, bearing the smallest number of pectinal teeth of any species of *Hadogenes* and resembling in this respect *Cheloctonus* and *Opisthacanthus*. The presence of lobes at the base of the fingers of the hand appears to be limited to the males only in this species. In *troglydites*, *trichiurus* and its sub-species *pallidus* and *zuluanus*, and in the typical form of *gracilis*, it is found in both sexes; in *gracilis fluvialis* and *taeniurus* it occurs in neither, while in *granulatus* it is present only on the fingers of the female, where it is exceptionally well developed.

SOLIFUGAE

Family HEXISOPODIDAE

Genus CHELYPUS Purcell

CHELYPUS COATONI sp. n.

Figs. 3, d—f

Holotype 1 ♀ (NM. 9154), between Koes and Aroab, S. W. Africa, collected by W. G. Coaton, April 1965.

Colour entirely pale yellow except for the chitinized portions of the chelicera as shown in Fig. 3d.

Headplate 3—4 times as wide as long, covered posteriorly by the overlying abdomen; anterior margin quite straight; eyes small, about 3 times their diameter apart; whole of headplate entirely free of granules, smooth, uniformly covered with very fine short setae.

Chelicera as in Fig. 3d seen from outer side, a dagger-like process dorsally at base of the fang directed upwards and forwards, just posteriorly and laterally to this process a small tooth; posterior to the large process a cluster of numerous fine long setae pointing upwards and forwards, scattered among them 12—13 minute, short, blunt-tipped spines.

Stridulatory lamellae showing no tendency towards anastomosing, instead very distinct and well raised, consisting of 14 long, parallel, straight ridges.

Dentition. Outer main series, Fig. 3d, with 6 teeth, the first and last small, the remainder of moderate size; inner cheek series with a single minute tooth situated at posterior extremity of the jaw; ventral jaw without keels or granules on outer or inner surface.

Pedipalp very short, subequal to leg I, considerably shorter than in *Siloanea macroceras* Roewer, with ventral spination as follows: tibia with a long pointed spine near apex as in Roewer's figure 247a of *S. macroceras*; metatarsus with 4 fairly long and strong pointed spines at distal apex, 5—6 much weaker ones proximally to these; tarsus with a cluster of 4 shorter, thicker spatulate spines at extreme apex, the segment thickly covered with long bacilliform setae slightly expanded at their apices, Fig. 3e.

Legs. Leg II with an outer regular row of spatulate spines from patella to tarsus, III similar but the last two segments without spines; the last three segments of leg IV as in Fig. 3f seen in ventral view, the metatarsus with a strong lateral swelling as in the ♀ of *C. lennoxae* Hewitt. Only 2 small malleoli present on the coxa of leg IV, in this respect resembling Roewer's genus *Siloanea*.

Dimensions. Total length 8 mm.

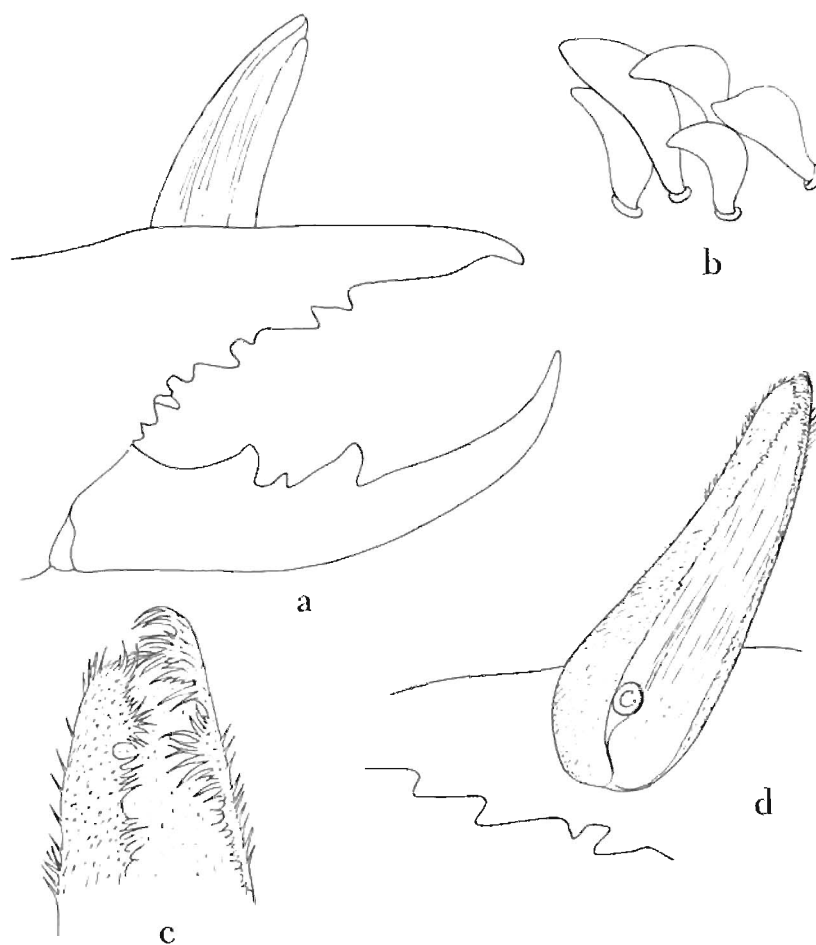


FIGURE 4. *Biton arenicolus* sp. n. ♂: a, lateral view of chelicera; b, ctenidia of first stigma-bearing sternite; c, apex of flagellum enlarged, mesial view; d, flagellum, mesial view..

Remarks. The species strongly resembles *Siloanea* Roewer in having only two malleoli on the coxae of leg IV and in the horn-like process at the base of the dorsal fang which in *Siloanea* consists of two branches, in *C. coatoni* only one. No females of any species of the genus *Chelypus* have ever been discovered and it seems to me extremely probable that Roewer's genus *Siloanea* merely represents the female form of *Chelypus*; if this is so there must be very considerable heteromorphism in the sexes, the females having a smaller number of malleoli and a dorsal horn-like process behind the fang. *Siloanea macroceras* would then most probably be the ♀ of *Chelypus macronyx* Hewitt, while the above described form would be the ♀ of *C. lennoxæ* Hewitt.

C. coatoni, while agreeing with *S. macroceras* in the spination of the pedipalp differs from it in its much smaller size, shorter pedipalp, absence of granules on the headplate, and one instead of two dorsal horns at the base of the dorsal fang of the chelicera. It differs from the male of *C. lennoxæ* from Upington, Cape, in its smaller size, far stronger dentition, and also in the stridulatory apparatus with its large number of remarkably well developed lamellae.

Family DAESIIDAE

Genus BITON Karsch

BITON ARENICOLUS sp. n.

Fig. 4

Holotype 1 ♂, Obib sand dunes, Diamond area of South West Africa (28°—05' S, 16°—48' E), collected by W. D. Haacke, November 1962.

Colour probably somewhat faded, head and abdomen apparently without markings, pedipalp with some ill-defined diffused purple markings especially on femur and base of metatarsus, femur and tibia of leg IV, and femur of III.

Spination and setation. Chelicera with a few very long, strong erect setae dorsally; headplate with similar setae, a row of 4 on each side of the ocular tubercle along anterior margin; sides and posterior margin with some others but few in the middle of the headplate which is covered with a dense under coat of very short fine spicules; posterior margin of thoracic tergites with a regular row of stiff, horizontally projecting setae, much shorter than those of the headplate and chelicera; tergites of

abdomen with an irregular row of long slender setae on or near their posterior margins, otherwise sparsely covered with an under coat of much shorter, weaker setae; sternites with a quite dense coating of short fine fur-like setae.

First stigma-bearing sternite on each side of middle line with a compact group of 16—18 short thick fleshy ctenidia as in Fig. 4b, resembling those of *betschuanicus* Kraepelin in shape; second stigma-bearing sternite without ctenidia.

Pedipalp. Metatarsus with 4 pairs of strong, blunt, but fairly short spines; tarsus with 1 similar but shorter spine in the middle of its infero-lateral surface; tibia with 4—5 long strong setiform spines along its inner margin, femur similarly with 1—2.

Trochanteral segments of legs II—IV with some strong spine-like erect setae dorsally, generally 1 on each of these segments.

Flagellum as in Fig. 4a seen from the outer side, Fig. 4d from inner side (further enlarged), more elongate and more blunt at apex than usual; when rotated forwards falling far short of the fang-tip, the inner surface of the capsule almost entirely open, the edge of the anterior margin turned over covering about a third of its width, the posterior margin not at all; inner apex with the spiculae enlarged as in Fig. 3c.

Dentition as in Fig. 4a, the dorsal jaw deep except at extreme apex, deeper than the slender ventral jaw; outer series with 4 small teeth following the third main tooth, inner cheek series consisting of 3 teeth; inferior margin of dorsal jaw above the tooth row on inner surface with a curved row of 9—10 long strong spine-like setae.

Stridulatory area of inner surface with 18 ridges occupying the upper half of this surface; this unusually large number consists of lamellae which though longer and finer than usual, being more closely packed, are nevertheless quite distinct.

Dimensions. Length of chelicera 4.7, width of headplate 3.3, pedipalp approximately 17, total length approximately 17 mm.

The species in the key to the genus comes nearest to *B. triseriatus* Lawrence, but differs markedly in the shape of the flagellum, the shape and number of the abdominal ctenidia and other details; it resembles *D. betschuanicus* in the number and shape of the latter, but differs in most other respects. The large number of close-set stridulatory lamellae is most unusual in this family of Solifugae.

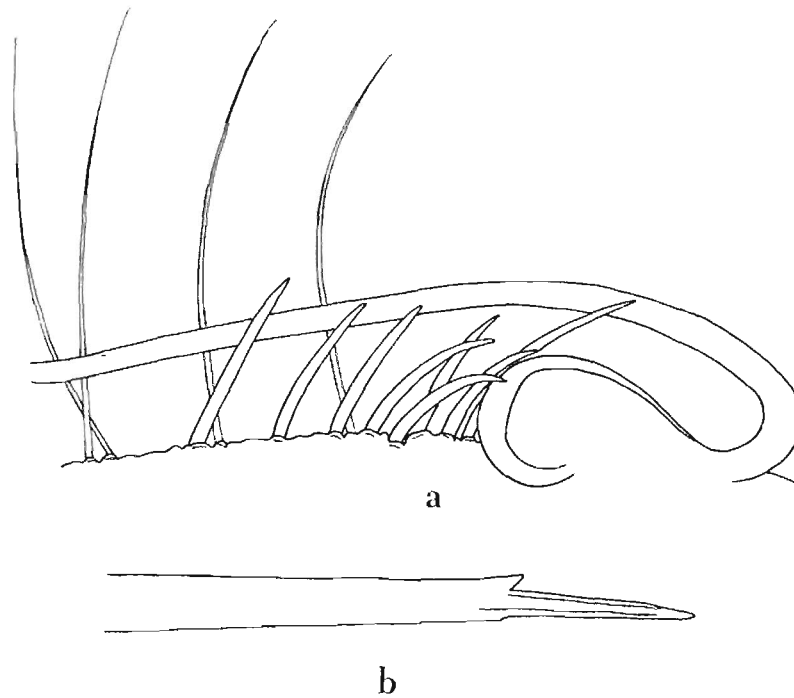


FIGURE 5. *Solpuga lawrencei* Roewer ♂: *a*, dorsal margin of chelicera just behind the basal enlargement of flagellum, mesial view; *b*, apex of flagellum enlarged, from above.

Family SOLPUGIDAE

Genus SOLPUGA

SOLPUGA LAWRENCEI Roewer

Fig. 5

S. lawrencei Roewer 1934, Bronns Klass. Ordn. d. Tierreichs, 5, Buch 4, p. 452, fig. 293e, e'.

This is a very distinctive and easily recognised species; it is apparently confined to the littoral of S.W. Africa, the type being designated as coming from the „Namib“, and as far as is known does not occur inland at all. It is unusual in two respects, the entire body being pale yellow without darker markings of any kind and secondly in having a group of blade-like spines on the dorsal surface of chelicera behind the basal-enlargement. Roewer's brief description consists of only three lines in the key to the genus, but his figures 293e, e' represent the chelicera and flagellum fairly accurately. The Natal Museum has a ♂ specimen from the Namib Desert Research Station at Gobabeb, collected by Dr. C. Koch, and another from between Usakos and Swakopmund, collected by Mr. G. F. Pretorius (NM. 9152).

The following is a supplementary description of the species based on the last named specimen:

Chelicera with rather sparse but very long erect setae; behind the basal enlargement a group of 5–6 blade-shaped spines much shorter and thicker than the setae, with bluntly pointed apices, Fig. 5*a*; near them a number of spiniform setae, which have more sharply pointed apices and are intermediate in length and thickness between the spines and the long slender setae with their tapering apices.

Flagellum shaft, seen from above, more or less parallel to the long axis of the chelicera, almost straight in its basal fourth, the distal three-fourths with a long weak bend, the convexity of the curve on the lateral side. Apex of flagellum from above as in Fig. 5*b*, enlarged, a small, rather blunt subsidiary tooth near apex; seen from the sides, both lateral and mesial, this tooth is invisible, though shown in Roewer's figure of the chelicera in mesial view, 293e; the slight upwardly bent apex ends in a blunt rounded point and just before the apex there is a narrow transparent lamella for a short portion of the dorsal margin.

Dentition. Intermediate tooth of dorsal jaw unusually large; 4 teeth posterior to the third main tooth of the outer series, the first and second subequal, the third larger, the fourth smaller than these. Inner cheek series consisting of 4 teeth, the first very large, the second and fourth small, subequal, the third moderate, the second much closer to the first than to the third. Ventral jaw with a strong smooth raised keel along the entire length of its outer surface; 9 strong stridulatory ridges.

Headplate with numerous long erect setae, especially along the sides, 3 considerably thicker and shorter spiniform setae on each side of the ocular tubercle; between the eyes 4 short dark-tipped setae projecting directly forwards, ocular tubercle with numerous other setae, some very short. Tergites with numerous slender setae as on headplate, but

shorter and weaker, a sparse under coat of much shorter setae.

Pedipalp. Femur in distal half with a group of spiniform setae on inner ventral surface, at least one of these very long and strong; metatarsus with cylinder bristles, these not numerous, a thick scopula of short, dense, hairs on its ventral surface, except at extreme ends of segment; tarsus unusually long, also with a few cylinder bristles ventrally.

Legs. Leg IV with some extremely long, slender hairs, especially on dorsum of tibia and metatarsus, but no mane.

Dimensions. Total length 43, pedipalp 52; length of chelicera 12.5; width of headplate 9.2, length 8 mm.