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THE ARACHNID FAUNA OF THE KALAHARI GEMSBOK NATIONAL PARK PART 1 A REVISION OF THE SPECIES OF "MOLE SOLIFUGES" OF THE GENUS *CHELYPUS* PURCELL, 1901 (FAMILY HEXISOPODIDAE)

by

BRUNO H. LAMORAL*

Abstract – Basic explanations and illustrations of morphological terminology currently used in solifuge taxonomy are provided together with keys to the known families of solifuges from southern Africa and the revised species of *Chelypus* Purcell. The morphological criteria used by previous authors to differentiate certain species of *Chelypus* are shown to be unreliable due to intra-specific variations. As a result of this *C. macronyx* Hewitt, 1919 is placed in synonymy of *C. barberi* Purcell, 1901. In addition, *C. kalaharicus* Lawrence, 1949 and *C. wühlischi* Roewer, 1941 are placed in synonymy of *C. hirsti* Hewitt, 1915. *Chelypus coatoni* Lawrence, 1966 is transferred to *Siloanea coatoni* (Lawrence, 1966).

Introduction

About 900 species of solifuges are found throughout the world and of these approximately 240 have been described from southern Africa. Passing from east to west and upwards from south to north in this sub-region the number of species increases, reaching a climax in the western areas of South West Africa, southern Angola and northern Cape Province of South Africa. While only 15 species are known from regions bordering the eastern seaboard, 100 are known from South West Africa alone. One would expect that the fauna of the Kalahari desert would be represented by an intermediary figure of about 60 species in this numerical cline from east to west and south to north. Yet only about 30 species have been described from the Kalahari desert system and only 10 recorded or described from the Kalahari Gemsbok National Park. Having first hand knowledge of desert and semi-desert biomes and ecological factors favouring survival of solifuges I have no hesitation in concluding that the

* *Natal Museum, Loop Street, Pietermaritzburg.*

numerical discrepancy just mentioned is due to lack of collecting records. This situation is further hampered by the well-known fact that collecting solifuges is a time-consuming process requiring dexterity, patience and "good legs". Being at the right place, at the right time of the day, season and year is probably one of the most important single factors affecting the success of solifuge collecting.

The solifuge fauna of southern Africa is fairly well known thanks to the pioneering and valuable past work of several specialists in this group. Of particular value are papers or monographic treatments by the following authors: Hewitt (1919), Kraepelin (1899, 1908), Lawrence (1955, 1963, 1968, 1972), Purcell (1899) and Roewer (1934, 1941, 1954). No modern student of this group can hope to study our fauna without reference to these essential references. Notwithstanding these valuable contributions, much work still has to be done on our fauna, particularly in certain poorly collected regions, before an integrated picture of its composition can be produced. The central and southern regions of the Kalahari probably top the list of poorly collected areas in southern Africa.

The present paper is the first of a series planned to report on the results of my investigations into our present state of knowledge of the arachnid fauna of the Kalahari Gemsbok National Park which, at the time of writing this paper, appears to be fairly representative of the southern and central parts of the Kalahari semi-desertic region.

Existing collecting records from the Gemsbok Park are few in numbers. This situation was slightly improved in the course of a one month collecting trip to the Park in March–April, 1970 when collecting was below average due to the unusual drought that prevailed in the northern Cape that year. It is hoped that another collecting trip, before the end of this survey, will be possible in order to considerably boost available records.

While the primary aim of the planned series of papers is to report on the taxonomic status of Arachnida occurring in the Kalahari Gemsbok National Park, it has been kept in mind that these papers may prove useful to professional or non-professional biologists who might not be very familiar with the terminology and approach used in the specialised field of Arachnology. For this reason I shall endeavour to broaden their scope by supplying more basic diagnostic information and illustrations than is the rule in specialised papers.

Morphological terminology

There is no single readily available publication in most southern African research centres that clearly defines or illustrates current morphological terminology used in solifugid systematics in either English or Afrikaans. Fig. 1 illustrates most terms used in the present study and follows to a large extent that used by Millot and Vachon (Traité de Zoologie, VI, 1949) and current usage in English speaking countries. Table 1 serves as a guide to the numbers and names of pedipalp and leg segments in solifuges.

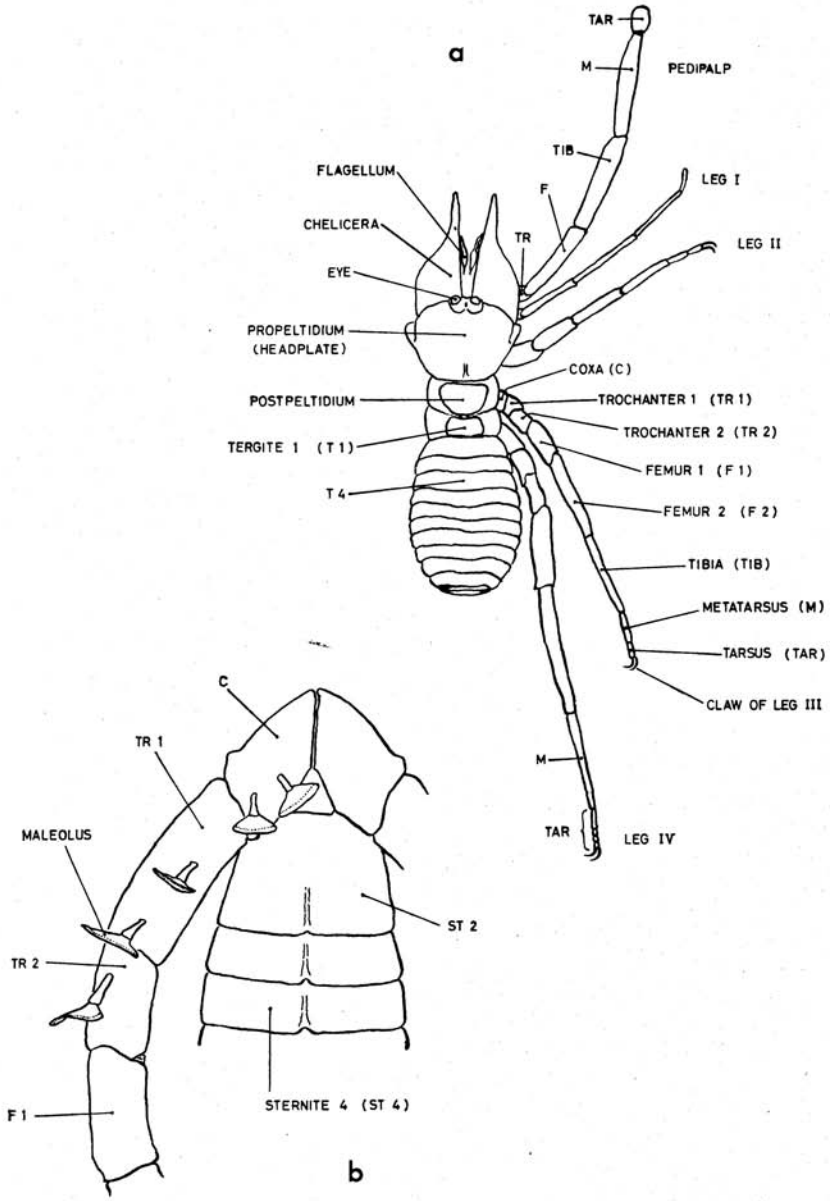

Fig. 1. *a*, dorsal outline of a solifuge of the genus *Biton* to illustrate terminology used in text (left appendages omitted); *b*, ventral outline of first four proximal segments of fourth right leg to show position and morphology of malleoli.

One of the most prominent features of solifuges are the numerous and diversified setae or hairs found on the bodies and appendages of most species. Some authors have in the past used the term "spine" when referring to broad non-flexible strong setae. This practice should not be

encouraged and dropped altogether as there are very few true spines in solifugids. Most contemporary arachnologists use the terminology used by entomologists and never use the word spine when referring to strong setae. It is, however, quite acceptable to use the term "spine-like setae" when referring to the strong setae found on the appendages of most solifuges. The difference between a spine and a seta is clearly highlighted by the fact that a spine is an outgrowth of the cuticula whereas a seta is an extension of the epiderma. Tore-Bueno (1950) gives the following definitions for these two structures: "*setae* (sing., seta), macrotrichia; commonly known as hairs; hollow structures developed as extensions of the epidermal layer." "*Spine*, a multicellular more or less thorn-like process or outgrowth of the cuticula not separated from it by a joint." One can add here that all setae are linked to the cuticula by a membranous joint which allows movement of a greater or lesser extent, dependable on their function.

Systematic Account

Of the six families of solifuges known so far from southern Africa, three have been found to occur in the Kalahari Gemsbok National Park. The names of these three families are printed in bold type in the following key to the families of southern Africa. Only one family, namely Hexisopodidae, will be treated in this paper. Other families will be dealt with in future issues of *Koedoe*.

1. The second, third and particularly the fourth pair of legs, much reduced in length, robust and adapted for burrowing; leg IV without tarsal claws (figs 2, 3 *b*) . . . . . **HEXISOPODIDAE** Pocock

   Legs neither reduced in length nor adapted for burrowing; leg IV with tarsal claws (figs 1, 3 *c–f*) . . . 2
2. Tarsus of first leg with two very small to minute tarsal claws (fig. 3 *a*) . . . 3

   Tarsus of first leg without any vestige of claws 4
3. Tarsi of legs II to IV with one segment (fig. 3 *c*); flagellum of males fixed at its base on the chelicera . . . . . KARSCHIIDAE Roewer

   Tarsi of legs II to IV with two segments (fig. 3 *d*); flagellum of male rotatable . CEROMIDAE Roewer

4. Tarsi of legs II and III with four segments; tarsus of leg IV with six or seven segments (fig. 3 *e*); flagellum of males

consisting of an elongated cylindrical shaft with a basal enlargement firmly fixed to the chelicera . . . . . **SOLPUGIDAE** Roewer

Tarsi of legs II and III with one or two segments; tarsus of leg IV with not

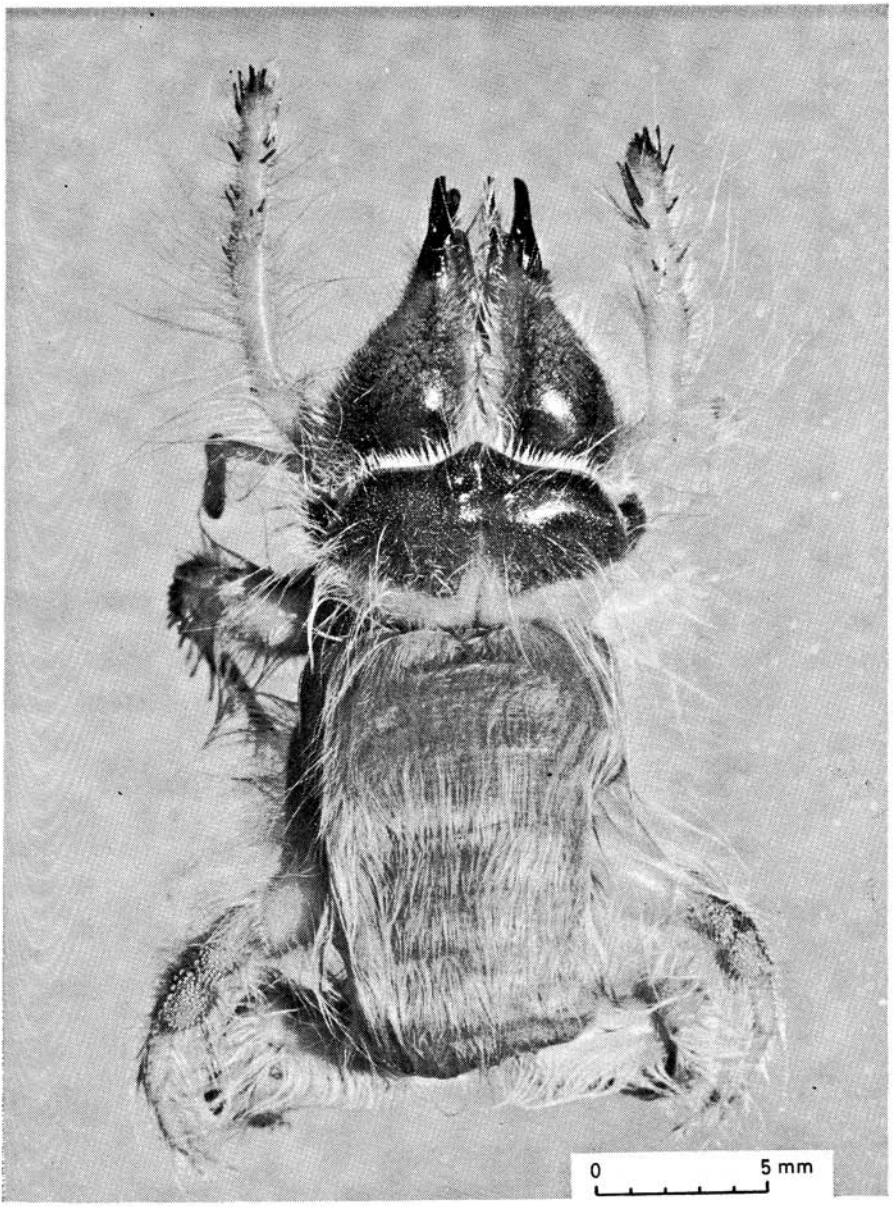

Fig. 2. Dorsal view of a male *Chelypus hirsti* Hewitt (NM 9191).

more than four segments (fig. 3 *f*); flagellum of male in the shape of a capsule or a flexible and densely hairy rod, fixed or rotatable 5

5. Flagellum of male fixed at its base, consisting of a cluster of differentiated rod-like setae; dorsal jaw of chelicera usually with a number of small teeth in front of the anterior tooth . . . MELANOBLOSSIIDAE Roewer

Flagellum of male rotatable at its base, in the shape of an open membranous capsule; dorsal jaw of chelicera usually without small teeth in front of the anterior tooth . . . . . **DAESIIDAE** Roewer

Family HEXISOPODIDAE Pocock, 1897
("Mole Solifuges")

The following four genera have been described from southern Africa:

1. *Hexisopus* Karsch, 1878
2. *Chelypus* Purcell, 1901
3. *Mossamedessa* Roewer, 1934
4. *Siloanea* Roewer, 1934

Hexisopus and *Chelypus* are easily distinguished from *Mossamedessa* and *Siloanea*, the former two by having five malleoli on leg IV (two each on coxa and trochanter I, one on trochanter II), the latter two by having only two or three malleoli on leg IV (two on coxa, one or none on trochanter I).

All species of *Hexisopus* have no spine-like setae on their pedipalpi, those of *Chelypus* have strongly developed spine-like setae on their pedipalpi.

Only species of the genus *Chelypus* have so far been recorded from the Kalahari Gemsbok National Park and adjacent areas. The other three genera are confined to the western and central areas of the northern Cape, South West Africa and southern Angola in the southern African region. Only one species of *Hexisopus*, *H. fodiens* Simon, 1887 has been described from the central Kalahari. The ♀ type is indefinitely located from the Kalahari somewhere between Okahandja (South West Africa) and Lake Ngami (Botswana). Simon clearly states in his original description (1887) that the malleoli of leg IV number three (two on coxa and one on trochanter I). This strongly indicates that this species should be transferred to the genus *Mossamedessa* Roewer. Lawrence (1955) suggests that the type of *H. fodiens* was based on an immature specimen. This appears to be very unlikely as it has a body length of 23 mm according to Simon (1887).

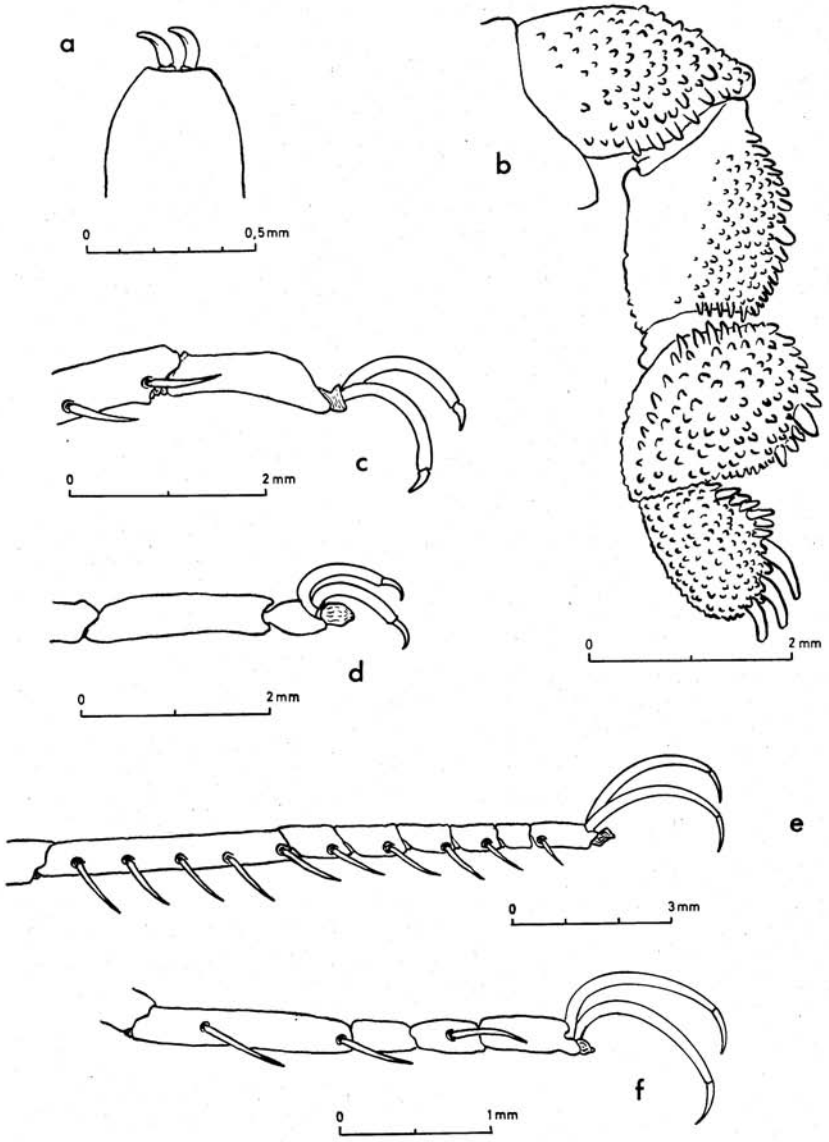

Fig. 3. *a*, ventro-lateral view of distal end of tarsus of leg I in *Trichotoma brunnea* Lawrence, (Karschiidae) showing the two greatly reduced claws; *b*, ventral aspect of last four segments of left leg IV in *Chelypus hirsti* Hewitt (Hexisopodidae), fine setae omitted; *c* to *f*, segmentation and spine-like setae of the tarsus of the fourth right leg (seen from the inner side) in four genera of solifuges represented by the following species: *c*, *Trichotoma brunnea* (Karschiidae), *d*, *Ceroma silvestris* Lawrence (Ceromidae), *e*, *Solpuga monteroi* Pocock (Solpugidae), *f*, *Biton tenuifalcis* Lawrence (Daesiidae).

Genus CHELYPUS Purcell, 1901

Type species: *Chelypus barberi* Purcell, 1901

Key to the southern African species of *Chelypus* Purcell (males)
(species recorded from the Kalahari Gemsbok National Park in bold type)

1. Distal end of flagellum shaft bifurcate . 2
   Distal end of flagellum shaft gradually tapering to a fine point 4
2. Metatarsus of leg IV with a well developed hook-like ectal lobe . . . . *lennoxae* Hewitt, 1912
   Metatarsus of leg IV without such a lobe, this segment hardly wider than adjacent segments 3
3. Lower jaw of chelicera with two rows of minute teeth forming serrated ridges *shortridgei* Hewitt, 1931
   Lower jaw of chelicera with one row of two large and one to two small teeth and with a second, short, inner row of four small teeth confined to the distal end of the fang . . . . . ***barberi*** Purcell, 1901
4. Propeltidium (headplate) blackish in anterior half; postero-dorsal surface of chelicera sometimes with a well to ill-defined blackish marking; lower jaw with three distinct teeth; metatarsus of leg IV wider distally than proximally . ***hirsti*** Hewitt, 1915
   Propeltidium and postero-dorsal surface of chelicera entirely yellow; lower jaw without teeth but with two finely serrated keels; metatarsus of leg IV narrower distally than proximally . . . *eberlanzi* Roewer, 1941

Siloanea coatoni (Lawrence, 1966)

Chelypus coatoni Lawrence, 1966, *Scient. Pap. Namib Desert Res. St.*, 29: 7, 9, figs 3 *d–f*.

Holotype: 1 ♂, Natal Museum (NM 9154).

Type locality: near Aroab (26.48S, 19.39E), South West Africa.

In his description of this species Lawrence pointed out that it may have to be transferred to the genus *Siloanea* Roewer as it has only two malleoli on leg IV. Lawrence also quite pertinently remarks that no females of the genus *Chelypus* have ever been discovered and that it seems extremely

probable that Roewer's genus *Siloanea* merely represents the female form of *Chelypus*, the difference in number of malleoli being attributable to sexual dimorphism. Lawrence's suggestion appears to be unfounded as Roewer described both *Mossamedessa abnormis* (1934) and *Siloanea eberlanzi* (1941) from males which have three and two malleoli on leg IV, respectively. Roewer has also described other species in these two genera from females bearing numbers of malleoli on leg IV diagnostic of either genera. On the ground of available criteria, it is clear that *C. coatoni* should be transferred to *Siloanea coatoni* (Lawrence).

Chelypus barberi Purcell, 1901
(Figs 4 *a* to *d*)

Chelypus barberi Purcell, 1901, *Ann. S. Afr. Mus.* 2(6): 224–225, fig. 10. 1 ♂ type, South African Museum.

Type locality: about 100 miles south of the junction of the Moshowing with the Molopo Rivers, Northern Cape Province (28.00S, 22.00E).

Chelypus macronyx Hewitt, 1919, *Rec. Albany Mus.*, 3: 213–215, fig. 4. 1 ♂ type British Museum Nat. Hist. (no. 1952.10.14.9).

Type locality: N. W. Rhodesia (Dr. S. Colyer). **NEW SYNONYMY.**

Having examined the types of both *C. barberi* and *C. macronyx*, I have no hesitation in synonymising the latter with the former. In his original description of *C. macronyx*, Hewitt states that it "greatly resembles *C. barberi* Purcell, being distinguished therefrom most readily in the length of the tarsal claws of the second leg". This statement constitutes the only criterion offered by Hewitt to distinguish his new species from *C. barberi*. It is a well-known occurrence that the length of tarsal claws in burrowing arachnids such as mole solifuges, varies considerably from one individual to another as a result of their burrowing activities. Examination of the claws of leg II which are well worn and blunt confirms this observation. Hewitt's type is an unusually large specimen measuring 38 mm in total body length; the claws and strong spine-like setae of the legs together with the teeth of the upper and lower jaws of the chelicerae are well worn. In all other respects, Hewitt's type agrees well with Purcell's description and type of *C. barberi*.

Lawrence (1955) in his key to the species of *Chelypus* separates *C. macronyx* from *C. barberi* by stating that the former has "Tarsus and metatarsus IV of equal length; inner side of lower jaw without a row of small teeth", whereas the latter has "Tarsus of leg IV much shorter than metatarsus; inner side of lower jaw near fang tip with a row of small teeth". The sagital length of tarsi and metatarsi of both fourth legs in the type of *C. macronyx* are 1,5 and 2 mm respectively, thus giving a ratio of 3:4. This ratio agrees very well with that illustrated in fig. 4 *b* and those found in all available specimens of *C. barberi*. The type of *C. macronyx* has a definite, though worn, inner row of small teeth near the distal end of the fang tip. There are thus no further doubts that *C. macronyx* is conspecific with *C. barberi*.

Purcell's original description of *C. barberi* is very comprehensive and there is no need for a revised account in this paper. Fig. 4 serves to depict features of diagnostic importance not illustrated by Purcell or subsequent authors.

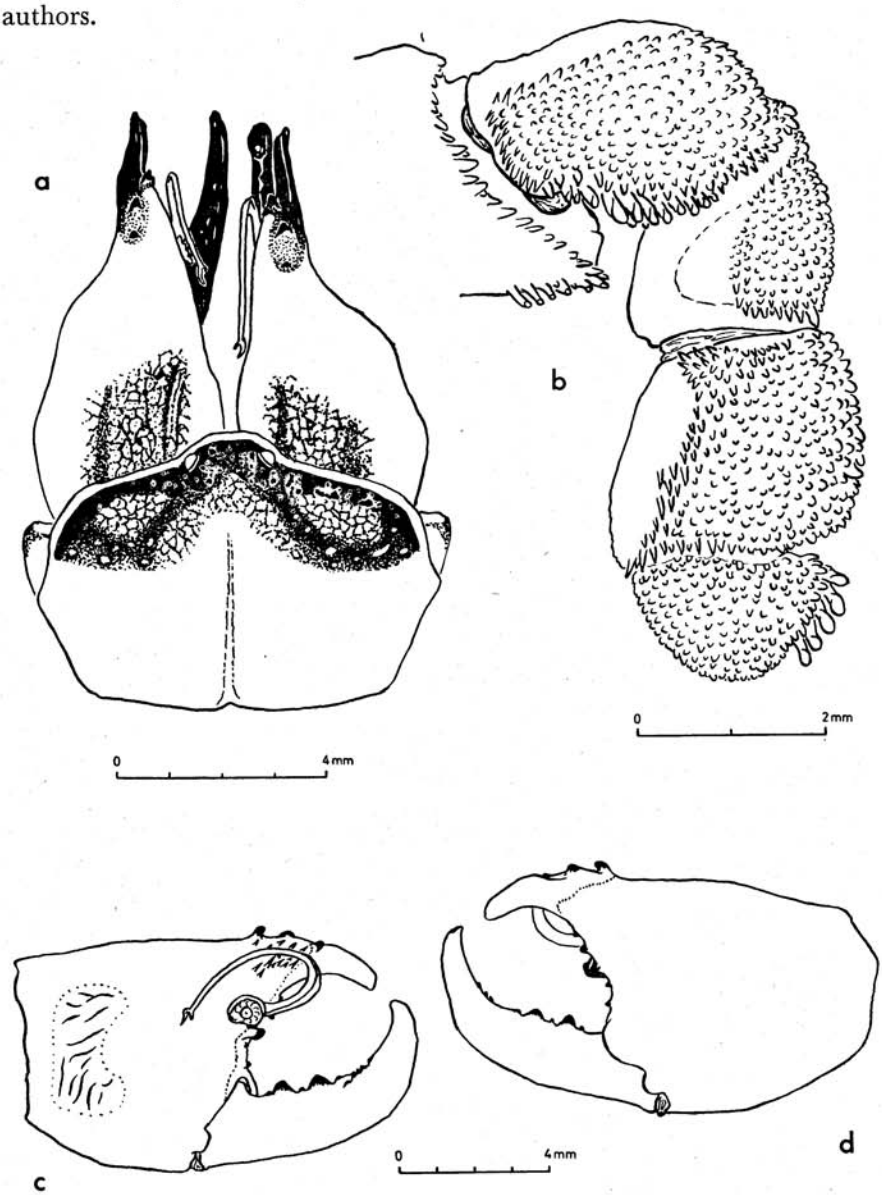

Fig. 4. *Chelypus barberi* Purcell, ♂.
a, colour pattern of propeltidium and chelicerae (NM 9189);
b, ventral aspect of last four segments of left leg IV (NM 9175);
c, inner aspect of left chelicera (NM 9175);
d, outer aspect of left chelicera (NM 9175).
Fine setae omitted in all drawings.

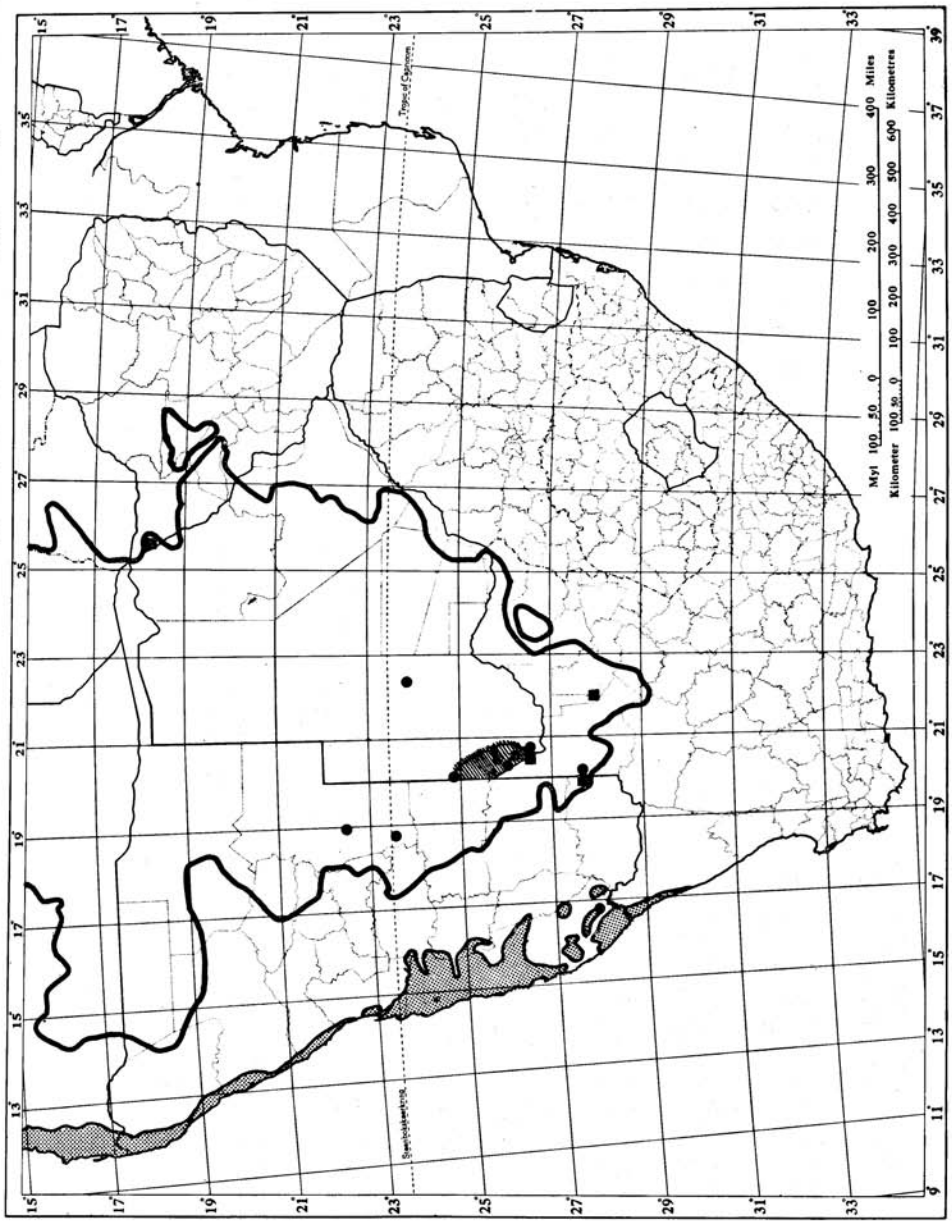

Fig. 5. Map of Southern Africa showing distribution of *Chelypus barberi* Purc. (■) and *C. hirsti* Hewitt (●). Thick line outlines extent of Kalahari sand (after S. H. Haughton, 1963, Fig. 45); stippled portions represent areas covered with Namib sand dunes (after map of South West Africa 1966, 1: 1 000 000, compiled and drawn in the Office of the Surveyor General, Windhoek, 1965); Kalahari Gemsbok Park hatched.

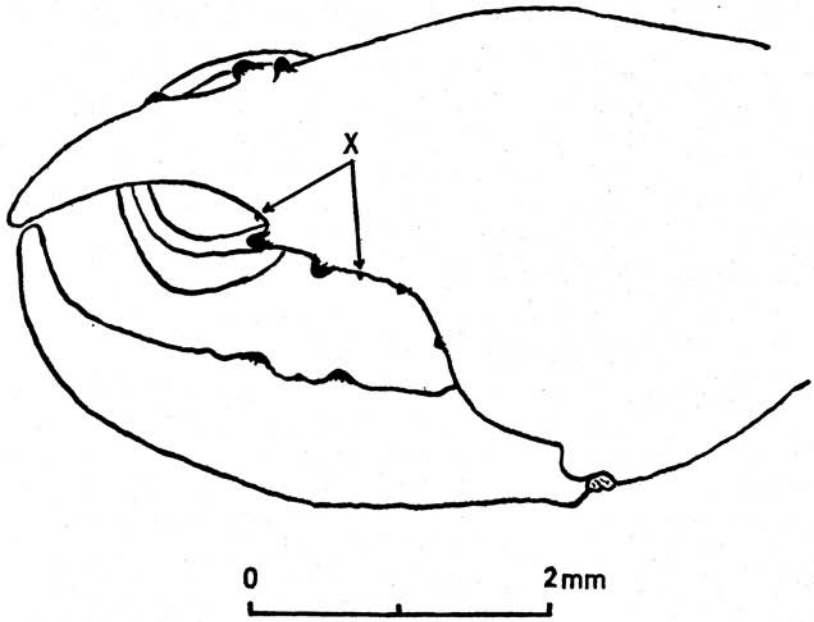

Fig. 6. *Chelypus kalaharicus* Lawrence, ♂ type.
outer aspect of left chelicera; X shows position of two minute teeth not figured in original drawing (partly after Lawrence 1949).

and Lawrence (1949: 202, fig. 1 *d*) only show four teeth on the upper jaw of the chelicerae for their respective species. Re-examination of Lawrence's type (body length: 16 mm) which is definitely a juvenile to subadult specimen, has revealed that it has two additional minute teeth (see X in fig. 6) which in adult specimens of *C. hirsti*, collected in the same region, are better developed.

Roewer's type of *C. wühlischi* measures 18 mm in body length and is thus morphologically probably very similar to Lawrence's *C. kalaharicus*. This tends to indicate that Roewer either failed to see two extra minute teeth or that because of their very small size, he concluded that they had no significant taxonomic importance.

Examination of the dentition of the upper jaw in specimens of *C. hirsti* from various localities has further shown that the size, shape and distribution of the teeth is subject to variations during successive life stages and among adult specimens (fig. 7 *d–f*).

Lawrence (1949) states that *C. kalaharicus* has "9 spines (dorsal and ventral)" whereas *C. wühlischi* (Lawrence 1955) has "about 14 spines" on each metatarsus of the pedipalps. A count of the robust metatarsal spine-like setae on the pedipalps of Lawrence's type yielded a number of 11 and 12 for each respectively. Roewer's (1941, Taf. 12, Abb. 106–107) illustrations show that his type has an average of 11 of these spine-like setae on the metatarsus of the pedipalp. Counting of these same spine-like

setae on Hewitt's types of *C. hirsti* and all material available of this species yielded a range of 11–13 per pedipalp metatarsus, the mean being 12.

There is thus no further doubt that the morphological criteria used, before the present revision, to differentiate the three species just discussed, are so widely variable as to bridge the particular character sets proposed for the various species. Hence *Chelypus wühlischi* Roewer and *C. kalaharicus* Lawrence are undoubtedly synonyms of *C. hirsti* Hewitt.

It follows that a revised description of *C. hirsti*, taking into account morphological variations, is called for.

Revised description of *Chelypus hirsti* Hewitt, males, (figs 2, 3 *b*, 7 *a* to *f*)

Colour: Colour given using the ISCC-NBS Colour Designation (Kelly and Deane, 1965). Dorsal surface of propeltidium (headplate) and chelicerae with dark colour patterns as in Figs. 2 and 7 *a*, with the dark zones of the propeltidium and chelicerae purplish black no. 235, the light zones light orange yellow no. 70, and the distal end of dorsal jaws of the chelicerae changing from strong reddish brown no. 40 to deep reddish brown no. 41, and eventually to dark reddish brown no. 44, at the tip; the dark colour patterns on the dorsum of the chelicerae are sometimes almost, to completely absent in some specimens; when this occurs the area of the dark zones of the propeltidium is usually also reduced but never completely absent; tergites varying from yellowish gray no. 93 to light brownish gray no. 63; inner margin of tibia and outer margin of metatarsus of leg IV in most specimens with a longitudinal dark pattern dark grayish brown no. 62, in colour; whole of ventral surface and appendages (except ventral jaw of chelicerae) pale orange yellow no. 73; ventral jaw of chelicerae same as dorsal jaws; the robust spine-like setae of the pedipalps and legs II to IV, strong reddish brown no. 40; all long and fine setae (except those on inner side of the chelicerae jaws) found on body, chelicerae and appendages yellowish white no. 92; the minute globular spines (fig. 7 *c*) found on the dorsal sides of the propeltidium and chelicerae blackish purple no. 230 to dark brown no. 59.

Note: All colours given above were observed from a small sample of fairly freshly preserved specimens. The colour patterns of long preserved specimens, such as in Hewitt's types, are more subdued while the cuticle tends to be darker.

Chelicerae (figs 7 *a–b*, *d–f*): Seen from above the dorsal jaw at the base of the fang, with a proximally extended sclerotized patch, lobate in outline, which overlaps to the outer side; proximal inner margin of this lobate patch with two blunt tubercules and distal inner margin with one blunt tubercule (fig. 7 *a*). Dentition of upper and lower jaws as in figs 7 *b*, *d–f*; distal and dorsal one third of lower jaw with one very small finely and irregularly serrated median keel flanked on the inner margin by a second, better developed keel bearing four to six very small teeth; dorsomedian one third of lower jaw with two large and one to two much smaller

teeth; proximal one third of lower jaw devoid of any teeth. Stridulatory area on inner proximal region of upper jaw weakly developed but fairly large in extent consisting of 8–10 low broad and blunt interconnecting

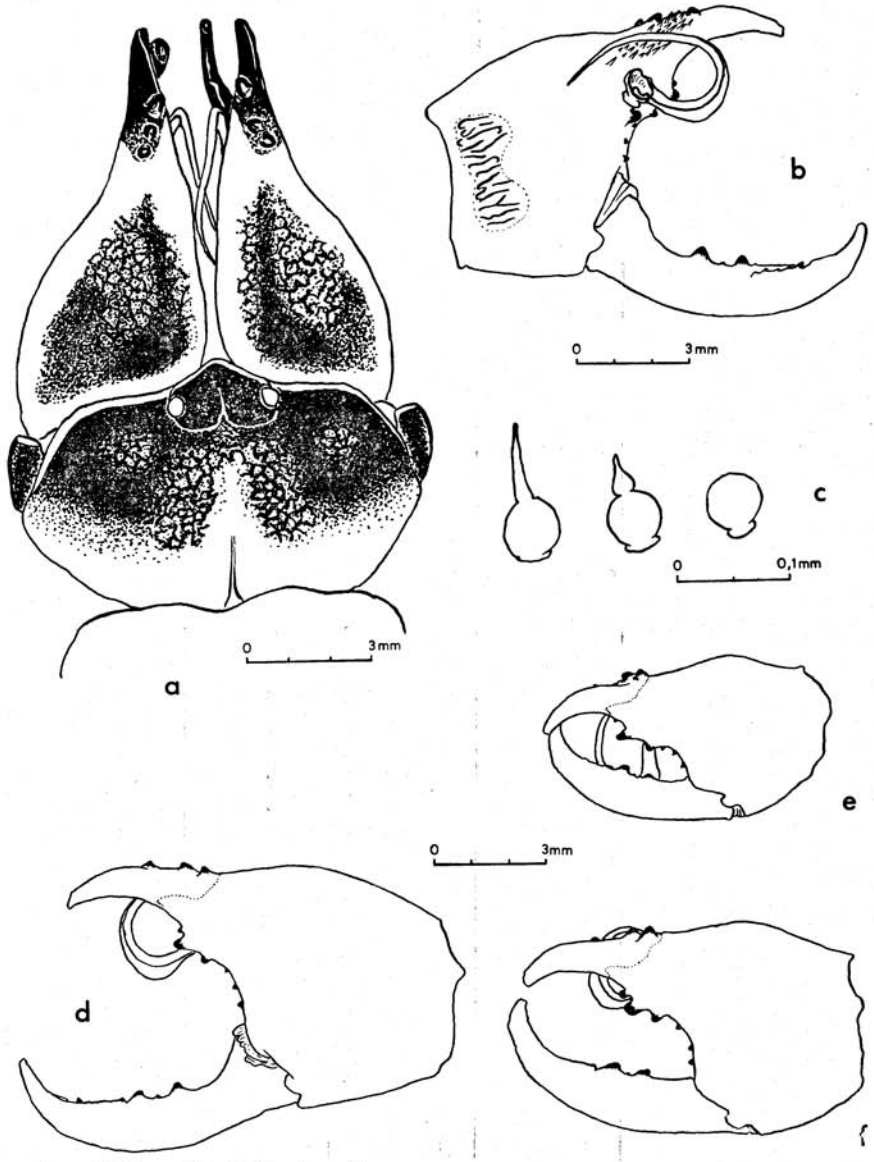

Fig. 7. *Chelypus hirsti* Hewitt, ♂.
a, most common colour pattern of propeltidium and chelicerae (NM 9191);
b, inner aspect of left chelicera (NM 9191);
c, lateral view of modified globular setae of anterior margin of propeltidium and dorso-proximal region of chelicerae;
d to *f*, outer aspect of left chelicera in three different specimens, namely *d*, NM 9191, *e*, NM 9177, *f*, NM 9190.

Table 1

Pedipalp and leg segmentation in Solifuges

pedipalps	coxa	trochanter		femur		tibia	metatarsus (basitarsus)	tarsus	post-tarsus modified into an adhesive organ
leg I	coxa	trochanter		femur 1 (prefemur)	femur 2 (femur)	tibia	metatarsus	tarsus	post-tarsus reduced, with or without 2 claws
leg II	coxa	trochanter		femur 1	femur 2	tibia	metatarsus	tarsus segmented or un-segmented	post-tarsus with 2 claws
leg III	coxa	trochanter 1	trochanter 2	femur 1	femur 2	tibia	metatarsus	tarsus segmented or un-segmented	post-tarsus with 2 claws
leg IV	coxa	trochanter 1	trochanter 2	femur 1	femur 2	tibia	metatarsus	tarsus segmented or un-segmented	post-tarsus with 2 claws or totally absent as in Hexisopodidae

ridges (fig. 7 *b*). Upper and lower jaws fairly long and moderately curved as in all species of *Chelypus*; most species of the genus *Hexisopus* have comparatively less well developed jaws.

Flagellum: As in figs 7 *a* and *b*.

Appendages: Tarsus of pedipalp with four strong and flat spine-like setae fanning from the antero-dorsal to the dorsolateral margin; metatarsus with a total ranging from 11–13 strong, round, but variable in length, spine-like setae; distal end of tibia with one or two outer and one inner round spine-like setae. Leg I without any spine-like setae. Tibia, metatarsus and tarsus of leg II with an outer row of respectively six, five and five (occasionally six) flat, sometimes spatulate, strong spine-like setae; outer and ventral region of femur with 15–20 spine-like setae of irregular size and shape; claws of leg II slightly curved, measuring about two-thirds of the tarsus in length. Tarsus of leg III with an outer row of 9–10 spatulate spine-like setae which are weaker than those of tarsus II; metatarsus III with a similar outer row and about 15 shorter spine-like setae on ventral side; tibia III with numerous globular short setae on ventral side flanked on outer margin with a row of eight slightly longer but much wider and stronger spine-like setae; inner margin of same segment with a similar row of 8–9 weaker but longer setae; ventral side of femur III with numerous globular and a few normally shaped short setae. Tarsus, metatarsus, tibia and femur of leg IV as in fig. 3 *b*; leg IV with the normal number of 5 malleoli on the ventral side.

Setation: All body parts and appendages, excluding flagellum and distal end of fangs, with a background vestiture of fine, elongated silky setae which are particularly abundant on the opistosoma (abdomen). Anterior region of propeltidium and dorso-proximal surface of chelicerae with many minute, rotund and shiny modified setae, most of which are globular, but some drawn out into shorter or longer spinous processes (fig 7 *c*). Area between the base of the flagellum and lobate patch above inner base of fang of upper jaw, with about 15–20 short spinose setae (fig. 7 *b*).

Eyes: Small (about 0,4 mm), five times their diameter apart, situated on a shallow tubercle which is sagitally depressed and projects forward well beyond the anterior margin of the propeltidium; mid anterior border of this projection, shallowly V-shaped.

Remarks: In the shape of its flagellum and general morphology *C. barberi* is most closely related to *C. eberlanzi* Roewer from Lüderitz in South West Africa.

Distribution (fig. 5). Besides the type locality this species has been recorded from the following localities: 1 ♂, Dikbaardmanskolk 25.45S, 20.43E, Nossob River, Kalahari Gemsbok National Park (Lawrence, 1959: 1959: TM 8818); 1 ♂, Twee Rivieren, 26.30S, 20.35E, Kalahari Gemsbok National Park, Col. G. Maclean (NM 9177); 1 ♂, idem, Col. B. Lamoral (NM 9190); 1 ♂, Tzatsone Pan, 23.50S, 22.20E, Botswana, Col. T. Schofield (NM 9178); 5 ♂♂, Obib sand dune, 28.09S, 16.40E, 54 km NNE of Oranjemund, South West Africa, Col. D. Brown and Furst (RM 7545).

Discussion and Conclusions

Notwithstanding the relative paucity of distribution records for species of the genus *Chelypus* a pattern has emerged. The genus appears to be endemic to the Kalahari and southern parts of the Namib sand systems outlined in fig. 5. *Chelypus hirsti*, as far as is known, is the only species that occurs in both these systems and it is quite likely that further collecting data will show that a gene flow between the southern Namib and southern Kalahari populations occurs in the interconnecting area situated between the 27° and 29° of longitude south. Although vast areas of sandy country such as is found in the Kalahari and Namib obviously offers optimum habitat conditions for these psammophilous solifuges, it is quite likely that fine loose substrata and sandy dry river beds and banks have contributed to the dissemination of populations.

C. eberlanzi and *C. hirsti* are probably sympatric in the southern Namib, while *barberi* and *hirsti* are definitely sympatric in the Kalahari. *C. lennoxae*, only known from Upington in the Northern Cape which is situated just out of the main body of the Kalahari sand system, may later be found to be sympatric with these last two species in the southern parts of the Kalahari.

Virtually nothing is known about the general biology of mole solifuges, except that they have been observed to burrow into and to move under loose sand at an incredible speed. All the specimens I collected were found walking on the sand surface either in midday or at night. Their diet most likely consists mainly of sand-living larvae and termites.

The family Hexisopodidae is endemic to the sandy regions of southern, central and eastern Africa and as far as I know, no species have been described from the Sahara Desert.

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