

Redescription of *Myrmochernes* Tullgren (Chelonethida: Chernetidae)

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Summary

The monotypic genus *Myrmochernes* Tullgren, 1907 is redescribed and transferred to the family Chernetidae Menge. The family Myrmochernetidae Chamberlin (only included genus, *Myrmochernes*) becomes a junior subjective synonym of the Chernetidae. The possible relationship of *Myrmochernes* to *Xenochernes* Feio, type of the subfamily Xenochernetinae Feio, is briefly discussed. Attention is drawn to the 'sensory seta' of the manducatory process, present in many other families of Chelonethida.

Introduction

The monotypic genus *Myrmochernes* Tullgren, was created for the morphologically unusual species *M. africanus* Tullgren, 1907, which had been found in a *Camponotus* nest in South Africa. Since this first collection, *M. africanus* has only been found once (Beier, 1964) and the genus has remained poorly known. The family Myrmochernetidae was subsequently erected by Chamberlin (1931) with *Myrmochernes* as the only included genus. Chamberlin based his decision solely on the basis of Tullgren's original description which, unfortunately, did not include details of characters such as the venom apparatus and genitalia, and which contained inaccuracies concerning the trichobothria and flagellum. Beier (1932) gave a brief redescription of *M. africanus*, in which he included an illustration of the trichobothria, but failed to mention the presence or absence of the venom apparatus. Despite correcting the description of the trichobothria, Beier continued to recognise the Myrmochernetidae and gave an amended diagnosis of the family.

In order to determine the status of the Myrmochernetidae and provide a revised description of *M. africanus*, the present author has examined all known specimens of this species. Most were examined whole in clove oil or, occasionally, in lactic acid. One male and one female syntype and a female from

Grahamstown were partially dissected, the appendages being mounted on slides; the female from Grahamstown was additionally treated with KOH. Measurements were made using a filar eyepiece, following Chamberlin (1931) and exclude granulation. The figures were drawn with the aid of an eyepiece grid and also exclude granulation.

Family Chernetidae Menge, 1855

Chernetidae: Chamberlin, 1931: 241; Muchmore, 1982: 101.

Myrmochernetidae Chamberlin, 1931: 240; Beier, 1932: 190.
NEW SYNONYMY.

Whilst distinctly aberrant, *Myrmochernes* is clearly a chernetid, as demonstrated by the form of the male genitalia which is typical of the family. The female genitalia are also of the chernetid type (shared by the Withiidae), with well-developed lateral apodemes and spermatheca. Chamberlin's family Myrmochernetidae, therefore, becomes a junior subjective synonym of the Chernetidae. With the inclusion of *Myrmochernes*, it becomes necessary to amend Muchmore's (1982) diagnosis of the Chernetidae to include species in which the venom apparatus would appear to be absent from both the movable and fixed fingers of the chelae.

In view of the uncertainty of relationships between taxa within the Chernetidae, it is not possible to determine the position or status of *Myrmochernes* at present. The situation is complicated by the possible relationship of the genus to *Xenochernes* Feio, 1945, type of the poorly-known subfamily Xenochernetinae Feio, 1945 (apparently regarded as being of tribal rank by Beier, 1970), (see below).

Genus *Myrmochernes* Tullgren, 1907

Myrmochernes Tullgren, 1907: 59-60; Beier, 1932: 190.

Type species

M. africanus Tullgren (by monotypy).

Amended diagnosis

Small chernetids of unusual, superficially cheiridiid-like, facies. Dorsally well protected: carapace, tergites and palps strongly sclerotised and granulate; lateral margins of tergites 1-9 or 10 downturned; tergite 11 often placed ventrally. Sternites less wide than tergites and weakly sclerotised; legs

relatively small. Carapace roughly triangular, broader than long, with two distinct furrows; eyes completely absent. Setae of dorsal surfaces (including palps and legs) strongly clavate, those of ventral surfaces simple or dentate; 'pseudotactile' setae absent from legs and terminal abdominal segments. Genital opercula of male and female with setae distributed as illustrated (Figs. 8 and 10). Male genitalia of typical chernetid type (see Legg, 1971); female with a large spermatheca composed of a short tube opening into a globose sac (Fig. 9). Palps robust; chela characteristic in shape, fingers short, stout and curved. Fingers of chela covered with a dense vestiture of long, acuminate setae; fixed finger of male with a group of about 100 sense spots, female with about 10. Trichobothria unusually fine, distributed as illustrated (Figs. 1 and 2). Venom apparatus apparently totally lacking in both fixed and movable fingers of chela. Hand of chelicera with four setae (*es* absent), *b* and *sb* clavate, not smooth as described by Beier (1932); flagellum of *three* blades, anterior two dentate and longer than basal blade (Fig. 6); galea with about six short rami (Fig. 5); serrula interior reduced to a velum with a single, small, dentate lobe. Legs granulate on all segments; slit sensilla of tarsi about 0.35-0.4 length of tarsus from base.

Distribution

Eastern Cape Province (South Africa).

Remarks

Myrmochernes is distinguished from other chernetids by a number of striking apomorphies including the absence of venom apparatus, accessory teeth and seta *es* of the chelicera, reduction of the lobes of the serrula interior, and the down-turned edges of the tergites. Whilst such a combination of characters marks the genus as being rather unusual, only the absence of the venom apparatus (which needs confirmation) is unique. The loss of venom glands is relatively uninformative, phylogenetically speaking, and much more weight is placed on the form of the genitalia, particularly that of the male. Despite its morphological specialisation, *Myrmochernes* does show some interesting similarities to the South American *Xenochernes* as noted above. These include the form of the lamina interior, the clavate shape of setae *b* and *sb* of the chelicerae and the

shape of the palps (though those of *Myrmochernes* are rather more robust). Unfortunately, my repeated requests for a loan of type specimens of *X. caxinguba* Feio, 1945, the only included species of the genus, have met with no reply, hence a detailed comparison of the two has not been possible.

Myrmochernes africanus Tullgren, 1907 (Figs. 1-10)

M. africanus Tullgren, 1907: 60-61, pls. IV-V, figs. 18a-e; Beier, 1932: 190-191, figs. 198-199; 1964: 75 (record only).

Type material

Syntypes: 5 ♂, 1 ♀ "Port Elizabeth, Capeland, ? (illegible, presumably 'H. Brauns leg.'). *Camponotus maculatus*" [*C. infuscus* Forel], Zoologisches Institut und Zoologisches Museum Hamburg, Katalog Nr. 286. All types examined; generally in good condition, though most have missing appendages, some of which were still in the vial.

Syntype males

Carapace: Strongly sclerotised, distinctly and evenly granulate; with two distinct furrows, anterior 0.46-0.51, posterior 0.78-0.84 of carapace length from anterior border; setae strongly clavate, composed of about 8 spines, chaetotaxy (total setae (ocular:median:posterior)) 100-104 (37-40:42-48:16-20); cheliceral conjunctivum well developed, medially notched, thickened laterally.

Tergites: Approximately 4 to 10 divided (divisions indistinct anteriorly and posteriorly); strongly granulate; lateral edges of 1 to 9 abruptly down-turned, less so posteriorly; 1 to 10 visible from above, 11 tending to become ventral and only occasionally visible dorsally. One specimen shows abnormal segmentation, the left half of tergite 9 having the postero-medial corner expanded and fused to the right half of 10. This is reflected slightly, but distinctly, by the sternites; the left half of sternite 8 is smaller than the right and the left half of sternite 9 is consequently larger than the right side. Setae of tergites (including 12) clavate; chaetotaxy, 15-17:18-20:17-20:19-22:19-22:18-20:16-21:17-20:17-18:11-16:8-13:2; most tergites with about 4-6 slit sensilla.

Sternites: Relatively weakly sclerotised, with faint granulation; 4 to 10 divided, posterior ones weakly

so; setae acuminate on anterior segments, tending to become more clavate posteriorly; genital opercula with setae distributed as illustrated (Fig. 8), posterior operculum with a row of 5-7 short setae situated interiorly near the anterior margin (referred to in parentheses in chaetotaxy); anterior spiracular plate with 1, posterior plate with two acuminate setae; chaetotaxy, 28-38:8-14(5-7):8-13:13-16:10-16:10-16:9-14:9-11:7-10:5-6:2; sternites 2, 3 and 11 each with 2 slit sensilla, 4-10 with about 4-6; each sternite in addition, with a pair of spot sensilla along medial line (one on each half); 11 with about 10 microlyriforms, loosely grouped, anteriorly.

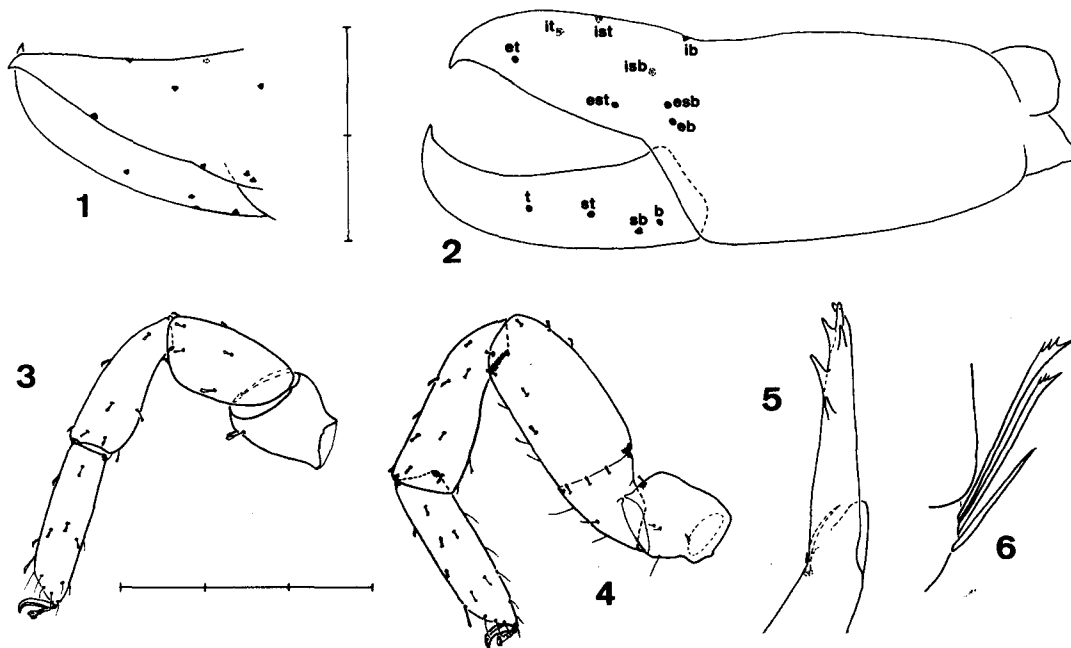
Pleural membranes: Thick, rugose, roughened; slit sensilla absent.

Genitalia (Fig. 7): General form as illustrated; lateral and median genital sacs not observed, but possibly present; ejaculatory canal not worked out in detail, but the two hammer-shaped, membranous sacs illustrated (Fig. 7) seem to be an evagination of the canal, just ventrad of the lateral diverticula (these sacs do not appear strong enough to serve for muscle

attachment and no muscles or glands could be seen associated with them).

Coxae: Palpal coxae strongly granulate anteriorly, becoming smooth towards posterior margin; coxae of legs I and II with very faint granulation along anterior border, lateral surfaces strongly granulate, coxae III and IV smooth; manducatory process smooth, with 2 setae, one short acuminate (usually apical) and the other elongate clavate, 'sensory seta' (see remarks below) short, situated at the base of process; setae of palpal coxae clavate anteriorly, becoming simple posteriorly, those of coxae I-IV generally acuminate, dentate only at anterior margins; anterio-lateral seta of I clavate; setae along posterior margin of IV relatively long, acuminate; chaetotaxy P 11-18: I 9-12: II 13-18: III 14-18: IV 22-31.

Chelicerae: Small; hand with 4 setae (*es* absent), *b* and *sb* clavate, *is* and *ls* simple; *gls* acuminate, subapical; flagellum (Fig. 6) composed of 3 blades (not 1 as stated by Tullgren (1907) or 2 by Beier (1932)), anterior two dentate and longer than the third, which is simple; serrula exterior with 15 blades,



Figs. 1-6: *Myrmochernes africanus*. Male syntype: 1 Chelal fingers, dorso-ectal; 2 Chela, ectal (fingers foreshortened due to curvature); 6 Flagellum. Female syntype: 3 Leg I (trochanter omitted); 4 Leg IV. Female (Grahamstown): 5 Galea, ventro-lateral. Scale divisions = 0.1 mm.

basal blade noticeably longer than others; galea with 5-7 rami; fixed finger with 1 subapical and 3 apical teeth, movable finger toothless.

Palps: Robust and strongly sclerotised; femur and tibia evenly granulate, setae clavate; hand of chela granulate, becoming smooth towards fingers which are themselves smooth with the exception of a little, light granulation on the mesal surface of the movable finger; fingers short and strongly curved, bearing a dense vestiture of long, acuminate setae, fixed finger in addition with several elongate, clavate setae (see Beier, 1932: Fig. 199); trichobothria very thin, distribution as illustrated (Figs. 1 and 2), *sb* sub-ventral, rather variable in position; fixed finger with about 100 sense spots situated on meso-dorsal surface from base of finger to just distad of *et*; teeth low, rounded and sub-contiguous; fixed finger with about 24-29 teeth plus a single tooth which is displaced externally at the distal end of the row (this is not a true accessory tooth); movable finger with about 24-30 teeth plus one external, terminal tooth (similar to that on the fixed finger), which lies between the displaced tooth of the fixed finger and the dental row when the fingers are closed; true accessory teeth are absent from both fingers; ducts and glands of venom apparatus apparently lacking in both fixed and movable fingers, though observation was hampered by the small size and strong sclerotisation of the specimens; no ducts could be seen in the venedens of the fixed or movable fingers, both of which have a closely appressed, seta-like lamina defensor.

Legs: As illustrated for female; robust and relatively small; all segments granulate; setae sparse, those of dorsal surfaces clavate, becoming longer and denticulate ventrally, elongate 'pseudotactile' setae absent; subterminal setae simple; arolia shorter than claws which are simple; slit sensillum present on tarsi of all legs (only visible in dorsal view, due to granulation of tarsi), about 0.35-0.40 length of tarsus from base.

Measurements (in mm) and proportions (based on all 5 males, except where noted; proportions in parentheses):

Palps: femur 0.35-0.39 x 0.13-0.14 (2.7-2.9)
 tibia 0.30-0.32 x 0.15-0.17 (1.8-2.1)
 hand (including pedicel) 0.31-0.37 x 0.17-0.18 (1.8-2.0)
 movable finger length 0.27-0.30 (hand/

finger 1.1-1.3)

chela length (inc. pedicel) 0.56-0.58
 (length/width 3.1-3.4)

Legs (based on one specimen)

Leg I: femur I 0.09 x 0.10 (depth/length 1.1)

femur II 0.16 x 0.08 (1.9)

tibia 0.18 x 0.06 (2.8)

tarsus 0.20 x 0.05 (3.9)

Leg IV: femur I 0.13 x 0.10 (1.3)

femur II 0.22 x 0.11 (2.0)

total femur length 0.32 (2.9)

tibia 0.24 x 0.08 (3.2)

tarsus 0.22 x 0.06 (3.6)

Carapace: 0.49-0.53 x 0.68-0.79 (b/l 1.4-1.5)

Body length 1.1-1.2

Syntype female

The female is generally very similar to the male, the only marked difference being the much greater number of sense spots on the chela of the male.

Carapace: Anterior furrow 0.48, posterior 0.83 of length from anterior border; chaetotaxy 111 (42:52:19).

Tergites: Chaetotaxy 21:23:22:23:22:23:19:19:16:15:10?:2.

Sternites: Genital opercula with setae distributed as illustrated (Fig. 9), no internal setae present; chaetotaxy 13:8:4?:19:18:16:11:10:9:6:2.

Genitalia: Lateral apodemes thin, but distinct; spermatheca not seen clearly, though no apparent differences from that of Grahamstown female were noticed (see below).

Coxae: Coxa IV with setae denser and longer than in male, about ten setae situated on the posterior-dorsal margin; chaetotaxy P 14: I 10-11: II 16-17: III 21-22: IV 44-46.

Chelicerae: Both galeae broken.

Palps: Fixed finger of chela with 11 sense spots arranged in two rows from level of *ist* to just distad of *et*; fixed finger with 29+1, movable with 26+1 teeth.

Legs (Figs. 3 and 4): Tarsus of right leg I (left leg I missing) apparently with a row of 3 slit sensilla arranged longitudinally.

Measurements and proportions:

Palp: femur 0.39 x 0.13 (3.1)

tibia 0.30 x 0.16 (1.9)

hand 0.34 x 0.18 (1.9)

movable finger 0.28 (hand/finger 1.2)

chela 0.58 (3.2)

Legs: Leg I, femur I 0.08 x 0.10 (1.3)
 femur II 0.16 x 0.08 (2.0)
 tibia 0.17 x 0.07 (2.6)
 tarsus 0.20 x 0.05 (4.0)

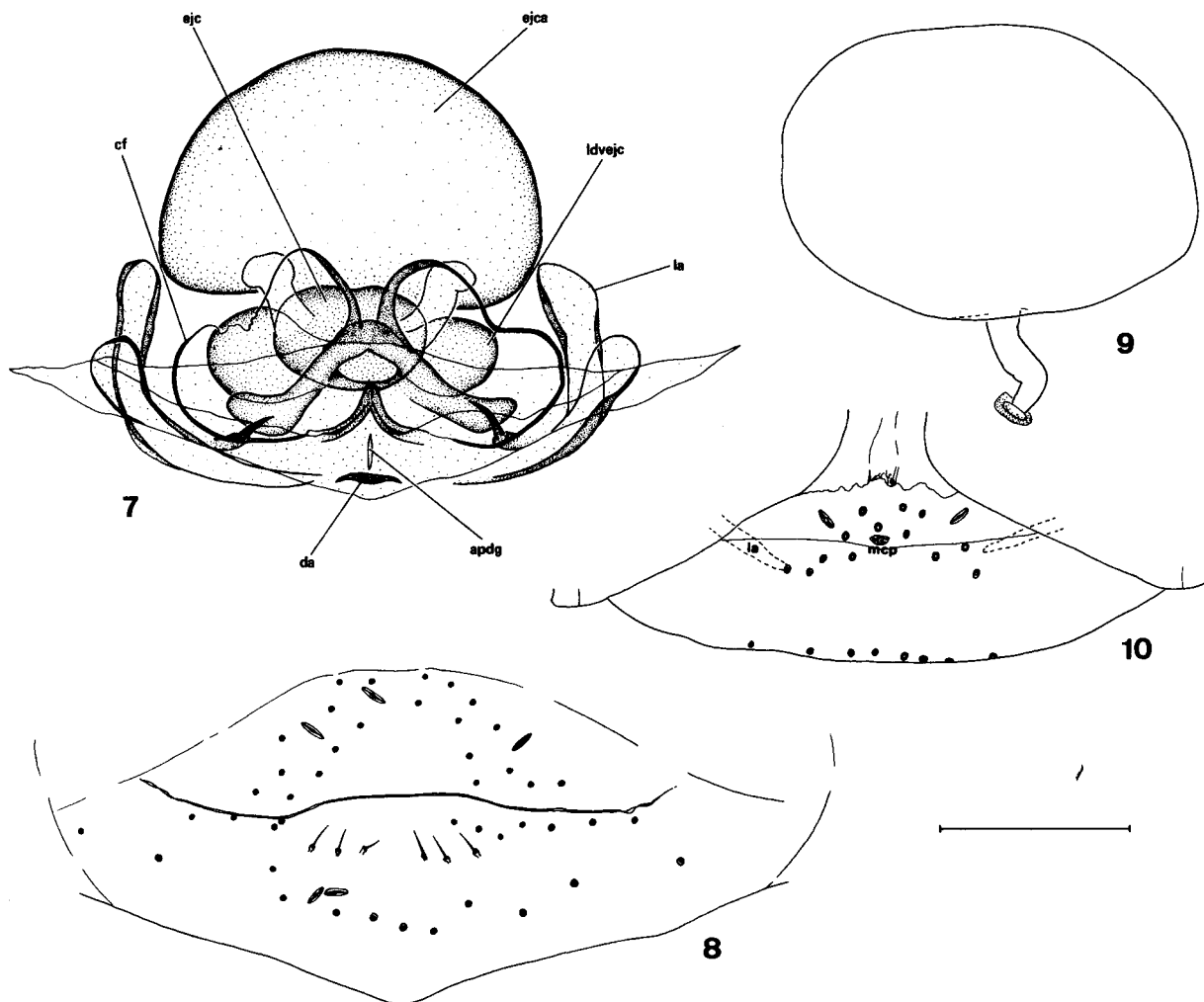
Leg II, femur I 0.15 x 0.10 (1.4)
 femur II 0.23 x 0.11 (2.1)
 tibia 0.25 x 0.07 (3.4)
 tarsus 0.22 x 0.06 (3.9)

Carapace: 0.49 x 0.74 (1.5)

Body length 1.1

Additional material examined

2 ♂♂, 3 ♀♀ "Grahamstown, May 1921" (M. Beier det.) (2 ♂♂, 1 ♀ (♀ dissected) in collection of The National Museum, Bulawayo, Zimbabwe; 2 ♀♀ in collection of the Naturhistorisches Museum, Vienna). These are the specimens recorded by Beier (1964) and though in rather poor condition, are clearly



Figs. 7-10: *Myrmochernes africanus*. Male syntype: **7** Genitalia, ventral (apdg = atrium of posterior dorsal gland, cf = cuticular frame, da = dorsal apodeme, ejc = ejaculatory canal, ejca = ejaculatory canal atrium, la = lateral apodeme, ldvejc = lateral diverticulum of ejaculatory canal); **8** Genital opercula (only internal setae drawn, others indicated by areoles). Female (Grahamstown): **9** Spermatheca. Female syntype: **10** Genital opercula (la = lateral apodeme, mcp = median cribriform plate). Scale line = 0.1 mm.

conspecific with the types.

Males and females

Carapace: Anterior furrow 0.44-0.50, posterior 0.73-0.83 length from anterior margin; chaetotaxy ♂♂ 106-117 (42-44:44-56:17-20), ♀♀ 126-138 (51-55:52-58:23-24).

Tergites: Chaetotaxy ♂♂ 18-20:20-21:18-21:22-23:22-23:22-23:21-24:22-21-23:15-19:8-11:2, ♀♀ (2 specimens) 24-26:23-25:23-25:25-26:23-27:25-28:25:25:23:12?:18:6-12:2.

Sternites: Chaetotaxy (1 ♂) 34:8?(6):8?:16?:18:15:13:11:8:2, anterior operculum of female with about 15-20 setae, posterior with about 9-14, chaetotaxy of remaining sternites indeterminate.

Genitalia: Details of female genitalia determined from the single specimen treated with KOH; spermatheca (Fig. 9) well developed, consisting of a large, globular sac with a short canal, similar to that of *Verrucachernes oca* Chamberlin, 1947; median cribriform plate poorly defined; male genitalia as described for syntypes.

Coxae: Chaetotaxy P 15-19: I 10-14: II 16-19: III 18-24: IV ♂♂ ±17-36 ♀♀ ±40-45.

Chelicerae: Female (1 specimen) galea with 6 rami.

Palps: Fixed finger of male with about 100 sense spots, female with 8-10; fixed finger with 25-30+1 teeth, movable with 23-31+1.

Measurements and proportions (males and females):

Palp: femur 0.36-0.39 x 0.14-0.15 (♀♀ 2.4-2.6, ♂♂ 2.7-2.8)
tibia 0.30-0.33 x 0.16-0.18 (1.7-2.0)
hand 0.31-0.36 x 0.19-0.21 (1.6-2.0)
movable finger 0.28-0.31 (hand/finger 1.1-1.3)
chela 0.58-0.62 (3.0-3.2)

Legs (1 female):

Leg I, femur I 0.08 x 0.10 (1.2)
femur II 0.18 x 0.09 (2.0)
tibia 0.18 x 0.07 (2.5)
tarsus 0.20 x 0.06 (3.4)

Leg II, femur I 0.15 x 0.12 (1.3)
femur II 0.22 x 0.12 (1.9)
tibia 0.26 x 0.08 (3.3)
tarsus 0.23 x 0.07 (3.5)

Carapace: 0.52-0.57 x 0.72-0.82 (1.4-1.5)

Remarks

The 'sensory seta' of the manducatory process, mentioned in the description, seems to be typical of all the chelonethid families so far examined, with the exception of those belonging to the Chthonioidea and Neobisioidea. These setae were apparently first noticed by With (1906: 28) and are present in all nymphal stages, as well as in the adults. They can be recognised by their position on the internal edge of the manducatory process, are often much reduced in length compared with the normal setae and are strongly curved, especially in species of the Cheliferoidea. Their function is not known, and it may be that they are chemosensory in nature.

It is unfortunate that the specimens from Grahamstown are not accompanied by habitat data, but it seems likely that this species will invariably be found in association with ants. As noted above, it appears to be well protected from above and in view of this and its small size, it is possible that they are only 'tolerated' by their hosts. In the absence of venom glands, it is unlikely that *M. africanus* feeds on adult ants. Elucidation of the biology of this species would obviously be of interest and might also help to determine the function of the sense spots of the chela in view of the pronounced sexual dimorphism in their number.

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