Records of the Western Australian Museum **17**: 447–449 (1996).

A new *Stygiochiropus* from a North West Cape (Western Australia) coastal plain cave (Diplopoda: Polydesmida: Paradoxosomatidae)

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Abstract – *Stygiochiropus peculiaris* sp. nov., is described from Camerons Cave, North West Cape, Western Australia. The new species is profoundly modified for cave life and its gonopods are more complex than in other *Stygiochiropus* species.

INTRODUCTION

Humphreys and Shear (1993) described a new paradoxosomatid genus, *Stygiochiropus*, for three new species found in caves in the Cape Range, North West Cape, Western Australia. One of these species, *S. communis*, is found in numerous caves throughout the karst region, while the other two, *S. isolatus* and *S. sympatricus*, are known only from single caves in the northern part of the generic range.

Camerons Cave (designated C [Cape Range karst area]452), from whence comes the new species described below, is not located in the Cape Range, but on the eastern coastal plain, at an altitude of *ca.* 13 m within the Exmouth town site. On the map published by Humphreys and Shear (1993; Figure 1), it would be placed about 4 km east of C-222, the type and only locality for *S. isolatus*. About 13 km to the northwest is C-111, type and only locality for *S. sympatricus*. The nearest cave with *S. communis*, the most widespread species, is 11 km southwest.

The cave is shallow and extends through the water table. The nature of the limestone in which the cave has formed is not known but appears to have formed in the Mowbowra Conglomerate, which comprises ridges of strongly calcretized gravel conglomerate, derived from Pleistocene shingle beachface (bar) deposits (Wyrwoll *et al.* 1993). The depth of the underlying Tulki limestone, within which caves containing the typical Cape Range fauna are found, is unknown.

Biologically, the caves on the coastal plain differ from those in the mountains. While some locally endemic genera of troglobites are in common, the species differ. An undescribed species of *Hyella* (Pseudoscorpionida) and a second species of *Draculoides* (Schizomida), *D. bramstokeri* Harvey and Humphreys, occur in Camerons Cave, along with undescribed ctenid and hahniid spiders, and a phalangodid opilionid. *Draculoides bramstokeri* also occurs on Barrow Island (Harvey and Humphreys 1995), some 160 km to the northeast, and several aquatic troglobites have a similar distribution (Humphreys 1993); Barrow Island would have been connected to the North West Cape peninsula about 10,000 years ago at a time of low sea level.

Because of the unique biological significance of Camerons Cave, the new milliped species is being described to make the name available for protection efforts. Camerons Cave is the only known humid cave on the eastern coastal plain and, save for *D. bramstokeri*, is the only known locality for the several species it contains.

Stygiochiropus peculiaris sp. nov., is widely divergent from its congeners in bearing two additional gonopod processes on the femorite, as decribed below. This makes it tempting to regard the species as the most plesiomorphic of the genus, since troglobitic adaptation often leads to gonopod simplification, not elaboration (Shear 1972), and the closest relatives of the genus have more complex gonopods with additional processes. However, *S. peculiaris* is probably as highly adapted to troglobitic life as any of the other species, with a loose-jointed, elongate body, thin, brittle cuticle, and attenuate legs and antennae. The presence of this species in a cave formed in Pleistocene deposits is intriguing. It seems likely that *S. peculiaris* is older than the cave in which it occurs, and as with other *Stygiochiropus*, lives mainly within microcaverns, emerging into caves accessible by humans only when conditions are propituous (Humphreys and Shear 1993).

The new species was first noted in 1993 when a dead, dried specimen was collected. Subsequently, in early 1993, the cave was irrigated and plant litter was added (as described in Humphreys 1991), with the result that the fresh specimens described below appeared.

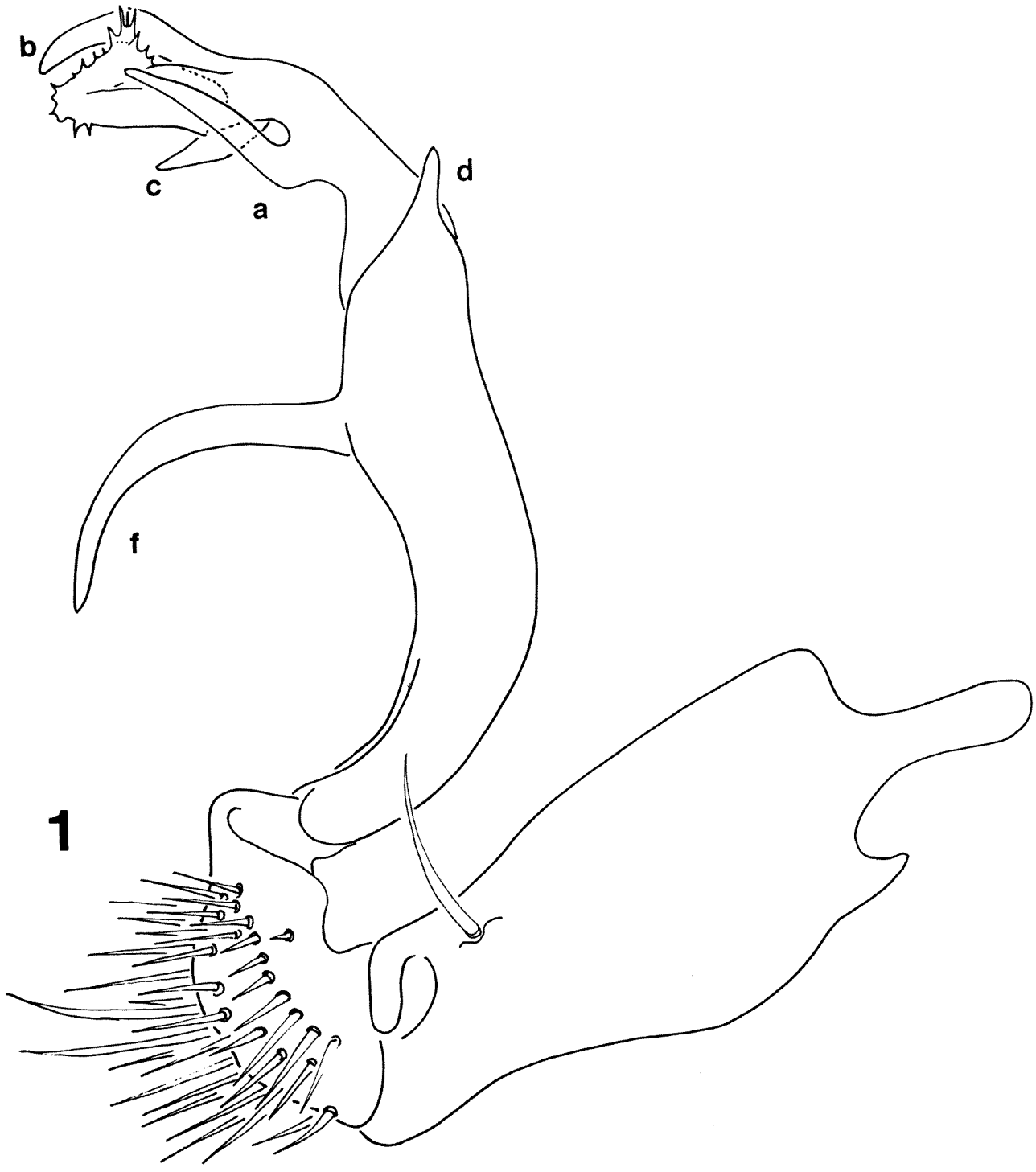

Figure 1 Left gonopod of *Stygiochiropus peculiaris*, lateral view.

SYSTEMATICS

Family Paradoxosomatidae Daday

Subfamily Australiosomatinae Brölemann

Tribe Antichiropodini Brölemann

Stygiochiropus Humphreys and Shear

Stygiochiropus peculiaris sp. nov.

Holotype

♂, Cave C-452 (Camerons Cave), Exmouth town site (21°57'56"S, 114°07'23"E), North West Cape, Western Australia, Australia, 11 January 1994, R.D. Brooks (WAM 95/480).

Paratypes

Fragments of juvenile, same collection data (WAM 95/481); dried and broken ♂, same locality, 10 August 1993, W.F. Humphreys, R.D. Brooks (WAM 95/482); 1 ♀, same locality, 28 August 1994, R.D. Brooks (WAM 95/483).

Diagnosis

Differing from all other species of the genus in the long process arising from the middle of the femorite.

Description

Male

Length, 13 mm; width at seventh metazonite, 1.0 mm; third antennal article 0.63 mm long. Nonsexual characters virtually identical to those described and illustrated for *Stygiochiropus communis* (Humphreys and Shear 1993).

Gonopods large and robust for size of animal, *in situ* with coxae and prefemora in contact, femorite then curves laterally and finally mesally so tips of gonopods touch in midline, femoral processes extending mesally and crossing. Prefemur short, less than 1/3 length of coxa, heavily setose, moderately curved. Prefemur/acropodite articulation well-formed, constricted. Femorite basally narrow, expanding to maximum width at base of median femorite process **f**; process long, thin, evenly curved, with acute tip. Distal femoral process **d** on lateral side subtending articulation of solenomerite, Solenomerite **s** broad, laminate, with marginal teeth. Process **a** as long as solenomerite, evenly tapering. Process **b** sickle-shaped, subequal to solenomerite. Process **c** short, acute.

Cuticle brittle, colourless.

Female

Length, 15 mm; width at seventh metazonite, 1.10 mm; nonsexual structures otherwise as in male.

ACKNOWLEDGEMENTS

The irrigation system was installed, maintained, and removed by Darren Brooks and the water provided courtesy of the Western Australian Water Authority. We thank R.L. Hoffman and D.G. Black for comments on the manuscript. The work was supported by grants from the National Estates Grants scheme to W.F. Humphreys.

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Manuscript received 3 July 1995; accepted 18 January 1996.