

ELECTRONIC APPENDIX

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The true identity of the supposed giant fossil spider
Megarachne

by

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Biol. Lett. (doi:10.1098/rsbl.2004.0272)

Electronic appendices are refereed with the text; however, no attempt is made to impose a uniform editorial style on the electronic appendices.

Supplementary material for:

The true identity of the supposed giant fossil spider *Megarachne*

by Paul A. Selden, José A. Corronca *and* Mario A. Hünicken

SYSTEMATICS

Order Eurypterida Burmeister, 1843

Superfamily Mycteropoidea Cope, 1886

Emended diagnosis. (see Tollerton 1989). Opisthosoma with enlarged first and second tergites.

Comments. *Mycterops whitei* Schram, 1984 shows has both first and second opisthosomal tergites enlarged.

Family Mycteropidae Cope, 1886

Emended diagnosis. (see Tollerton 1989). Mycteropoidea with a reticulate ornament on carapace and first opisthosomal tergite.

Included genera. *Mycterops* Cope, 1886.

Comments. *Mycterops* Cope, 1886 was known only from carapace and attached first tergite (*M. ordinatus* Cope, 1886; *M. mathieui* Pruvost, 1925) and some scraps of cuticle (e.g. *M. (?) blairi* Waterston, 1968) until Schram (1984) described a detached carapace and mesosoma on one slab, and isolated caudal segments and telson, as *M. whitei* Schram, 1984. The isolated caudal segments are not associated with the carapace and body segments, and so can only questionably be assigned to the genus. The photograph of the main specimen (Figure 7C) and the description suggest that this *Mycterops* has two enlarged tergites immediately behind the carapace. Though not so enlarged as in *Megarachne*, the second opisthosomal tergite in this small form has a bowed posterior margin. It is possible that *Mycterops* represents a juvenile woodwardopterid. However,

some cuticle scraps indicate that *Mycterops* could get very large (e.g. *M. ordinatus*, Kjellesvig-Waering (1959), Plate 38, figure 5; *M. (?) blairi*, Waterston (1968) Plate 1, figure 1), and still retain the reticulate ornament. For this reason, it is retained in a separate family until more complete material comes to light and help resolve the relationship of the mycteropoids.

Family Woodwardopteridae Kjellesvig-Waering, 1959

Emended diagnosis. (see Tollerton 1989). Mycteropoidea with an ornament of linguoid mucrones on carapace and first opisthosomal tergite.

Included genera. *Megarachne* Hünicken, 1980; *Vernonopterus* Waterston, 1968; *Woodwardopterus* Kjellesvig-Waering, 1959.

Vernonopterus is poorly known, does not show the characters of the family, and was placed here by Waterston (1968) because its preserved parts suggest enlarged tergites.

Genus *Megarachne* Hünicken, 1980

Emended diagnosis. Woodwardopterid with sparser mucrones on carapace and first two opisthosomal tergites than the nominate genus; prominent anteromedian carapace protrusion.

Comment. The sparser mucrones on *Megarachne* could be a function of ontogeny because *Megarachne* is larger than *Woodwardopterus* and possibly the mucrones became sparser with growth. Note that *Mycterops*, suggested above as a juvenile woodwardopterid, has dense mucronation; the gigantic *Cyrtoctenus* has localized mucrones. The prominence of the anteromedian carapace protrusion in *Megarachne*, not seen in *Woodwardopterus*, may be taphonomic, since it is not so pronounced in the second specimen of *Megarachne*. It may have been orientated downwards in life and compression during fossilization affected its appearance in the holotype.

Megarachne servinei Hünicken, 1980

Holotype. CORD-PZ 2110 in the Museum of Palaeontology, National University of Córdoba, Argentina.

Additional specimen. Part and counterpart in the private collection of Sr Guido Pollini of Santa Rosa, San Luis Province, Argentina.

Locality. Both specimens come from the upper part of the Pallero Member, the middle of three members constituting the Bajo de Véliz Formation, Santa Rosa II quarry, Santa Rosa, San Luis Province, Argentina. Age is latest Carboniferous, possibly earliest Permian (Hünicken *et al.* 1981).

Diagnosis. As for the genus.

Description of holotype. (Figure 1a, b in main paper). Carapace length 170 mm, maximum (posterior) width 180 mm; campanulate outline, with apparent anteromedian protrusion (may be taphonomically enhanced). Reniform lateral eyes 23 mm long with forwardly directed acute mucrone in front of each; lateral eyes lie on either side of circular ocular tubercle, 15 mm in diameter, bearing pair of median ocelli; ocular area situated subcentrally on carapace, 90 mm from anterior border. Median ridge runs from close to anterior border of carapace to just anterior to eye region. First opisthosomal tergite sutured to posterior border of carapace; sagittal length 38 mm, maximum (lateral) length 92 mm, width 190 mm; narrow medially, broadening laterally where produced into prominent, leaf-shaped epimera. Second opisthosomal tergite a large, subcircular plate 142 mm long, 147 mm wide. Carapace, first and second opisthosomal tergites ornamented with linguoid lunules, some folliculated; second tergite additionally bears ridges radiating slightly posteriorly, running from its anterior to posterior borders, resembling ribs on a scallop shell. No more of the opisthosoma preserved. Isolated plate,

68 mm long, bearing broad, unfolliculated lunules, may represent a detached coxa or metastoma. Two appendages seen on right side, one on left, but evidence of at least one more on the left side shown by ridge on the matrix. Anterior appendage on right shows 30 mm portion of podomere emerging from beneath carapace, followed by curved podomere 51 mm long; two connected podomere pieces (proximal 32 mm long, distal 27 mm long), slightly anterior to long axis of anterior appendage, may belong to this appendage. 32 mm portion of proximal podomere of posterior appendage on right emerges from beneath carapace, succeeded by two podomeres (proximal 48 mm long, distal 63 mm long). Visible appendage on left side shows portion of podomere 42 mm long emerging from beneath carapace, succeeded by 33 mm long podomere. Other podomeres on this side difficult to measure but show blade-like structures apparently developed from enlarged mucrones or spines. Most podomeres stout, with pronounced expansions at joints; longitudinal posterior groove apparent on second podomere of posterior appendage on right.

Description of new specimen. (Figure 1c, d in main paper). Part consists of carapace with anterior border poorly preserved; preserved length 141 mm, posterior width 172 mm, campanulate outline. Suboval lateral eyes 23 mm long (probably reniform in life but taphonomically compressed), on either side of circular ocular tubercle, 14 mm in diameter, bearing pair of circular median ocelli with procurved lunate mound in front; ocular area situated subcentrally on carapace, 87 mm from posterior border. Median ridge runs from close to anterior border of carapace to just anterior to eye region, separated from eye group by patch of pustules. T-shaped groove, 22 mm long, 20 mm wide, posterior to eye region. Part of ventral lateral plate of prosoma preserved on right side. First opisthosomal tergite sagittal length 42 mm, maximum (lateral) length 88 mm,

approximate width 186 mm; narrow medially, broadening laterally where produced into prominent, leaf-shaped epimera. Anterior border straight, where sutured to posterior border of carapace; posterior border strongly procurved, with angular notches separating epimera from main body of tergite. No more of opisthosoma preserved. Parts of four appendages preserved on right side. Antermost appendage with portions of six podomeres, measuring (proximal–distal) ≥ 15 mm, 26 mm, 41 mm, 43 mm, 54 mm, 64 mm. Second appendage with one podomere of length 48 mm; complex area of cuticle beyond suggests podomeres with blade-like structures belonging to this appendage. Third appendage with fragment of coxal *Lade* emerging from beneath ventral lateral plate; immediate post-coxal podomeres absent, more distal four measure (proximal–distal) 54 mm, 44 mm, 59 mm, 43 mm. At least third to fifth podomeres of anterior appendage, podomere of second appendage, and first and second post-coxal podomeres of fourth appendage with bulbous ends and posterior longitudinal groove. Only small fragment of coxa of posterior appendage preserved. Tiny fragment of podomere cuticle bearing strong mucrones on posterior edge lies beyond edge of carapace on left side.

Reverse of slab bearing part shows pair of large (appendage VI?) coxae (total width 126 mm), bearing mucrones with convex sides facing inwards, gnathobases showing at least five large teeth; parts of possibly two trochanters attached to anterolateral corner of each coxa. Anterior to the coxae lies a smooth, transversely suboval plate which may be the epistoma.

Counterpart shows no additional features to those seen on the part.

Genus *Woodwardopterus* Kjellesvig-Waering, 1959

Emended diagnosis. Woodwardopterid with relatively dense mucronation on carapace and first two opisthosomal tergites; no anteromedian carapace protrusion.

Woodwardopterus scabrosus (Woodward, 1887)

Holotype and only known specimen. I1445 (part) and I1436 (counterpart) in the Natural History Museum, London. Note: Waterston (1957) gave the accession number as 16082, but there is no doubt that the different numbers refer to the same specimen.

Locality. Fossiliferous shales on the eastern bank of the River Esk, Glencartholm, Dumfriesshire, Scotland. The shales occur within the Glencartholm Volcanic Beds of the Middle Border Group of southern Scotland, which roughly equates to the lower part of the Oil Shale Group of the Scottish Midland Valley; Lower Carboniferous, Viséan (Holkerian) in age (Lumsden *et al.* 1967).

Diagnosis. As for the genus.

Description. (Figure 1e, f in main paper). Carapace campanulate, with anterior doublure, but no prominent anteromedian protrusion; 146 mm long, 114 mm wide. Eye region obscured by CaCO₃ pustules. First opisthosomal tergite sagittal length 26 mm, length at lateral edge 50 mm but lateral edges obscure and epimera suggested on right side. Anterior border slightly recurved, sutured to carapace, posterior border slightly procurved. Only anterior part of second opisthosomal tergite preserved; lateral edges obscure, broken around lateral and posterior edges. Ornament of closely spaced mucrones on carapace and tergites 1 and 2, becoming sparser on posterior tergites; some posteriorly slightly radiating ridges on second opisthosomal tergite. Parts of opisthosomal tergites 3–7 seen on right side, delineated by tergal boundaries, bearing mucrones and 3–4 with slight submarginal longitudinal ridges, much shorter than tergites 1 and 2 (15 mm long), at 20° angle from posterior edge of tergite 1. Smooth cuticle emerging from beneath tergite 2 of left side is possible sternite. Parts of at least three appendages on each side preserved. Right anteriormost appendage shows 15 mm part of proximal podomere emerging from

beneath carapace, followed by 90 mm of appendage undifferentiated into podomeres, bearing blade-like structures posteriorly. Right second appendage shows fragment of coxa showing beneath broken carapace edge; detached section of five podomeres measuring (proximal–distal) 37 mm, 32 mm, 42 mm, 37 mm, 26 mm. Right posterior appendage shows piece of coxa emerging from beneath carapace, together with six post-coxal podomeres measuring (proximal–distal) 26 mm, 26 mm, 52 mm, 37 mm, 35 mm, 26 mm; podomeres 2–4 of this series show a posterior longitudinal groove. Left anterior appendage represented only by short fragments of proximal podomeres. Group of criss-crossing podomeres on the left side probably represents parts of left second and third appendages. Left posterior appendage consists of coxal fragments and series of three post-coxal podomeres measuring (proximal–distal) 36 mm, 46 mm, ≥ 26 mm. Detached piece, now mounted in plaster alongside remainder of holotype represents parts of posteriormost opisthosomal tergites; anteriormost incomplete, next 20 mm long, next 26 mm long; and telson. Telson a hastate, smooth plate with pair of parallel ridges (possibly on ventral surface but impressed through to dorsal during compaction) 12 mm apart; posterior tip broken, preserved sagittal length 44 mm.

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