

A new species of the pseudoscorpion genus *Anatemnus* (Pseudoscorpiones: Atemnidae) from tropical Australia

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ABSTRACT – The third Australian species of the pseudoscorpion genus *Anatemnus* is described from tropical Australia: *Anatemnus wongalara* sp. nov.

KEYWORDS: taxonomy, morphology, Arachnida

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INTRODUCTION

The pseudoscorpion family Atemnidae is currently represented by two subfamilies and 21 genera: Atemninae includes 15 genera and Miratemninae is represented by six genera. They occur in most regions of the world, but are more diverse in tropical ecosystems. The genus *Anatemnus* Beier, 1932 is currently represented by 22 species, with most occurring in Australasia (see Alexander et al. 2014; Gao and Zhang 2016; Harvey 2013; Hu and Zhang 2012). The only species known from outside Asia are *A. elongatus* (Ellingsen, 1902) from northern South America, *A. seychellesensis* Beier, 1940 from Seychelles Islands, and *A. madecassus* Beier, 1932, *A. oswaldi* (Tullgren, 1907), *A. subindicus* (Ellingsen, 1910) and *A. voeltzkowi* (Ellingsen, 1908) from Madagascar. Like many atemnidae genera, *Anatemnus* is poorly defined and most likely polyphyletic (Klausen 2005).

The Australian fauna currently comprises *A. cavernicola* (Beier, 1976) from a cave in north-western New South Wales (Alexander et al. 2014; Beier 1976) and *A. subvastus* Alexander, Burger and Harvey, 2014 from subterranean cavities in the Pilbara region of Western Australia (Alexander et al. 2014). This paper reports the discovery of a previously undescribed species of *Anatemnus* collected from northern Australia during a BushBlitz expedition to Wongalara Wildlife Sanctuary, situated in the tropical Northern Territory.

MATERIAL AND METHODS

The material utilised in the present study is lodged in the Museum and Art Gallery of the Northern Territory, Darwin (NTM). They were examined by preparing temporary slide mounts by immersing the specimen in 75% lactic acid at room temperature for one to several days, and mounting them on microscope slides with 10 or 12 mm coverslips supported by small sections of nylon fishing line. Specimens were examined with a Leica MZ16 dissecting microscope and a Olympus BH–2 compound microscopes, and illustrated with the aid of a drawing tube. Measurements (in mm) were taken at the highest possible magnification using an ocular graticule. After study the specimens were rinsed in water and returned to 75% ethanol with the dissected portions placed in 12 × 3 mm glass genitalia microvials (BioQuip Products, Inc.).

Terminology and mensuration largely follow Chamberlin (1931), with the exception of the nomenclature of the pedipalps, legs and with some minor modifications to the terminology of the trichobothria (Harvey 1992), chelicera (Harvey & Edward 2007; Judson 2007) and faces of the appendages (Harvey et al. 2012). Measurements were taken to the nearest 0.005 mm, and in the Dimensions sections expressed as length/width, except for the leg measurements which are length/depth.

Family Atemnidae Kishida, 1929**Subfamily Atemninae Kishida, 1929****Genus *Anatemnus* Beier, 1932**

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Anatemnus Beier 1932: 578.

TYPE SPECIES

Chelififer javanus Thorell, 1883, by original designation.

REMARKS

The new species described here is undoubtedly most similar to the Australian species *A. cavernicola* (Beier, 1976) and *A. subvastus* Alexander, Burger and Harvey, 2014 due to the arrangement of the trichobothria in which *isb* and *it* are widely spaced (Alexander et al. 2014; Beier 1976). Although this arrangement also occurs in the type species *A. javanus*, the assignment of the Australian species to *Anatemnus* was regarded as provisional by Alexander et al. (2014) as the generic classification and relationships of the Atemnidae are poorly understood and in need of critical reevaluation (Klausen 2005).

***Anatemnus wongalara* sp. nov.**

Figures 1–11

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MATERIAL EXAMINED**Holotype**

Australia: Northern Territory: ♂, Wongalara Wildlife Sanctuary, Bokalla Creek, 14°07'50"S, 134°20'38"E, 96 m, 29 May 2012, forest leaf litter, M.S. Harvey, M. Cheng (NTM A005312).

Paratype

Australia: Northern Territory: 1 ♀, collected with holotype (NTM A005318).

DIAGNOSIS

Anatemnus wongalara shares with the following species of *Anatemnus* the widely spaced *isb* and *it*: *A. angustus* Redikorzev, 1938, *A. cavernicola* (Beier, 1976), *A. chaozhouensis* Hu and Zhang, 2012, *A. elongatus* (Ellingsen, 1902), *A. javanus* (Thorell, 1883), *A. pugilatorius* Beier, 1965 and *A. subvastus* Alexander, Burger and Harvey, 2014 (see Alexander et al. 2014; Beier 1932b, 1951, 1965, 1976; Hu and Zhang 2012; With 1908). It differs from them as follows: from *A. angustus*, *A. elongatus*, *A. javanus* and *A. pugilatorius* by the thinner pedipalpal segments;

from *A. cavernicola* by the broader pedipalpal femur and patella [femur 2.78 (♂), 2.88 (♀) and patella 2.32 (♂), 2.33 (♀) × longer than broad in *A. wongalara* versus femur 3.3 (♀), patella 3.0 (♀) and chela (with pedicel) (♀) 2.9 × longer than broad in *A. cavernicola*]; and from *A. subvastus* by its larger size [e.g. pedipalpal femur 0.91 (♂), 0.94 (♀) mm in *A. wongalara* versus 0.59–0.71 (♂), 0.64 (♀) mm in *A. subvastus*].

DESCRIPTION**Adults**

Colour (Figures 1–6): pedipalps red-brown; carapace paler; legs yellow-brown.

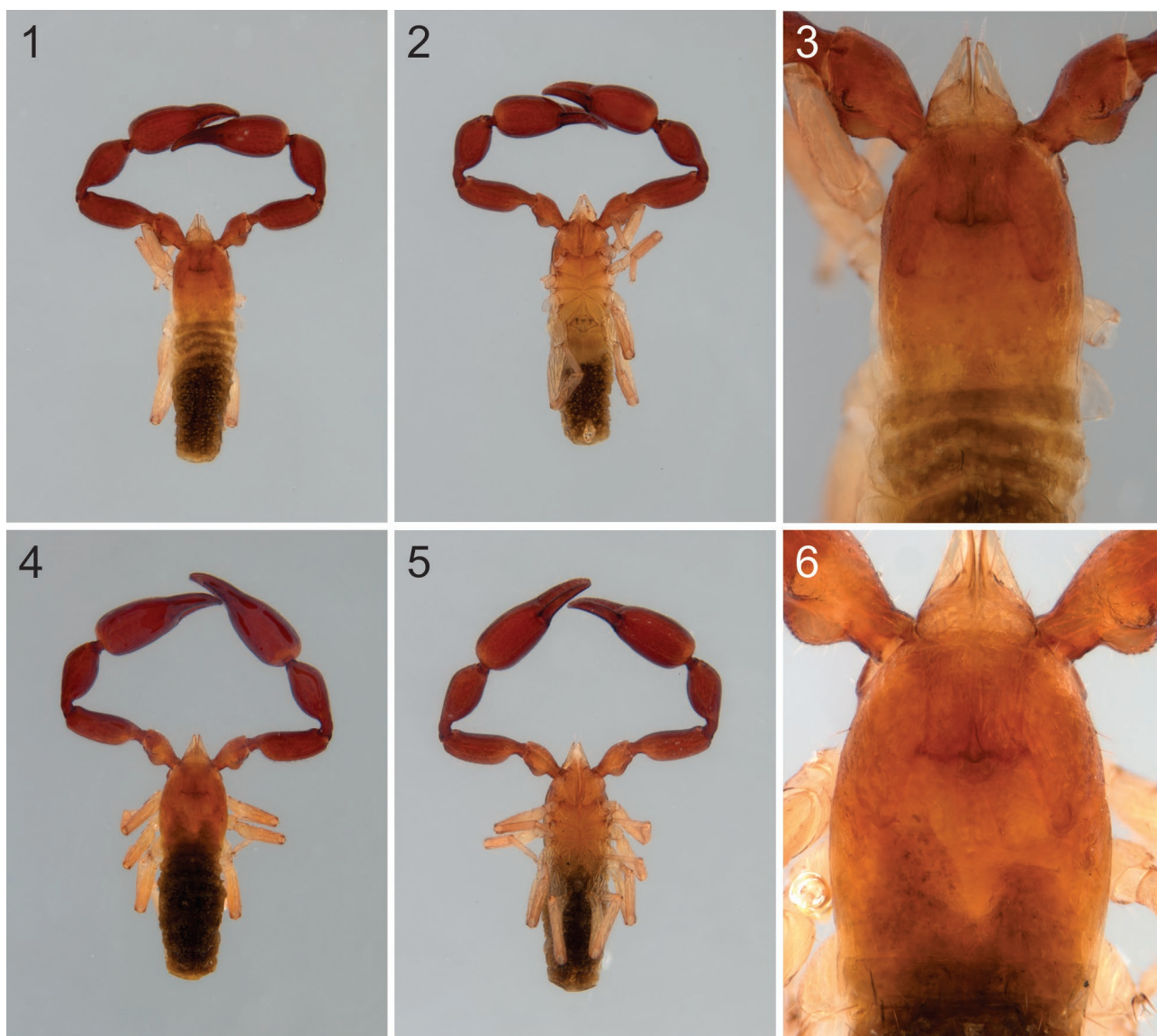
Cuticle and setae: most surfaces smooth, except for some pedipalpal segments which have granulations: dorsal face of trochanter, prolateral face of femur, patella and chela. Setae generally aligned perpendicularly from body, each seta acicular and very slightly curved.

Chelicera: with 4 setae on hand and 1 subdistal seta on movable finger, all setae acuminate, except for *bs* which is finely denticulate; seta *sbs* absent; *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea of ♂ and ♀ long and slender with 4 well-defined rami (Figure 10); rallum of 4 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 27 (♂), 24 (♀) blades; lamina exterior present.

Pedipalp (Figure 8): trochanter 1.93 (♂), 2.02 (♀), femur 2.78 (♂), 2.88 (♀), patella 2.32 (♂), 2.33 (♀), chela (with pedicel) 2.90 (♂), 2.93 (♀), chela (without pedicel) 2.70 (♂), 2.74 (♀), hand 1.51 (♂), 1.72 (♀) × longer than broad, hand 0.88 (♂), 0.69 (♀) × longer than movable finger. Fixed chelal finger with 8 trichobothria, movable chelal finger with 4 trichobothria (Figure 9): *eb* and *esb* situated at base of fixed finger on retrolateral face; *est* closer to *et* than to *esb*; *ib* and *ist* situated at base of fixed finger on prolateral face; *isb* about level with *est*; *it* midway between *isb* and tip of finger; *et* distad to *it*; *sb* much closer to *b* than to *st*; *st* slightly closer to *t* than to *sb*. Venom apparatus only present in fixed chelal finger, venom ducts short, terminating in inflated nodus ramosus between *it* and *est*. Both chelal fingers straight in lateral view (Figure 9). Chelal teeth: distal teeth pointed, with basal teeth becoming progressively more rounded; fixed finger with 34 (♂), 35 (♀) teeth; movable finger with 40 (♂), 41 (♀) teeth; accessory teeth absent; with 1 (♂), 3 (♀) small sense spots near *sb*.

Carapace (Figures 3–4, 7): 1.23 (♂), 1.25 (♀) × longer than broad; eyespots absent; with 45 (♂), 51 (♀) setae including 2 near anterior margin and 6 (♂), 8 (♀) near posterior margin; without obvious furrows, but with a faint medial furrow using high magnification.

Coxal region: manducatory process pointed, with 3 apical acuminate setae, 1 sub-oral seta plus 26 (♂), 25 (♀) additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: ♂, 9: 9: 8: 12; ♀, 11: 11: 11: 14.



FIGURES 1–6 *Anatemnus wongalara* sp. nov., holotype ♂ (NTM A005312): 1) dorsal; 2) ventral; 3) cephalothorax, dorsal. Paratype ♀ (NTM A005318): 4) dorsal; 5) ventral; 6) cephalothorax, dorsal.

Legs (Figure 11): junction between femora and patellae I and II oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.39 (♂), 3.37 (♀) × longer than deep; tarsus with basal tactile seta, TS = 0.11 (♂), 0.10 (♀); subterminal tarsal setae arcuate and acute; arolium slightly longer than claws, not divided.

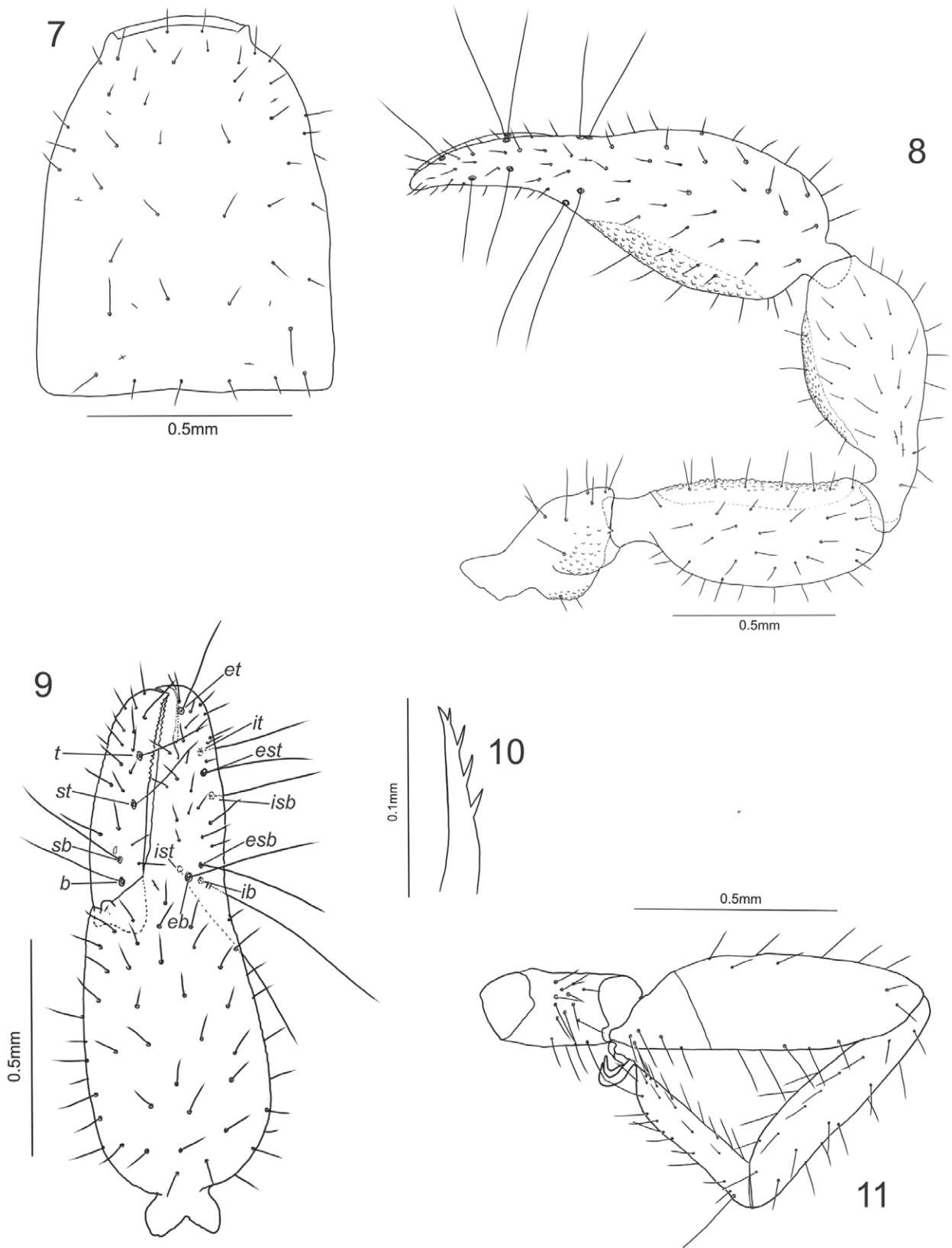
Abdomen: tergites without median suture line (Figures 1–2, 4–5). Tergal chaetotaxy: ♂, 9: 9: 9: 10: 11: 11: 11: 11: 13 (including 4 tactile setae): 8 (including 2 tactile setae): 2; ♀, 9: 9: 11: 13: 13: 12: 12: 11: 13: 17 (including 4 tactile setae): 8 (including 2 tactile setae): 2; uniseriate except for lateral discal setae on tergites IV–X; all setae long and acuminate. Sternal chaetotaxy: ♂, 15: (1) 7 [0 + 0] (1): (1) 11 (1): 15: 14: 15: 13: 16: 14 (including 4 tactile setae): 10 (including 4 tactile setae): 2; ♀, 12: (2)

11 (2): (1) 19 (1): 19: 19: 18: 16: 17: 18 (including 4 tactile setae): 11 (including 4 tactile setae): 2; uniseriate except for lateral discal setae on most sternites; all setae long and acuminate. Spiracles with helix. Pleural membrane longitudinally striate; without setae.

Genitalia ♂: dorsal apodeme with long and rounded apex, ejaculatory canal atrium broad, lateral apodemes spherical, lateral rods Y-shaped with rounded apices, hooked branches wide, genital atrium without genital setae.

Genitalia ♀: with single anteriorly directed spermathecal lobes and 1 pair of small lateral cribriform plates.

Dimensions ♂: holotype (NTM): Body length 2.78. Pedipalps: trochanter 0.520/0.270, femur 0.905/0.325, patella 0.895/0.385, chela (with pedicel) 1.390/0.480,



FIGURES 7–11 *Anatemnus wongalara* sp. nov., holotype ♂ (NTM A005312): 7) carapace; 8) right pedipalp, dorsal; 9) left chela, lateral; 10) left leg IV, retrolateral; 11, right galea, dorsal.

chela (without pedicel) 1.295, hand (without pedicel) length 0.725, movable finger length 0.640. Carapace 0.895/0.725. Leg IV: femur + patella 0.780/0.230, tibia 0.670/0.135, tarsus 0.460/0.090.

Dimensions ♀: paratype (NTM): Body length 2.80. Pedipalps: trochanter 0.555/0.275, femur 0.935/0.325, patella 0.885/0.380, chela (with pedicel) 1.510/0.515, chela (without pedicel) 1.410, hand (without pedicel) length 0.885, movable finger length 0.610. Carapace 1.025/0.820. Leg IV: femur + patella 0.860/0.255, tibia 0.730/0.135, tarsus 0.520/0.095.

REMARKS

The specimens of *Anatemnus wongalara* were collected from tropical vine thicket litter on a low rocky hill.

ETYMOLOGY

The species epithet is a noun in apposition based on the locality Wongalara. We are grateful to Zhizhong Gao and Jana Christophoryova for their very helpful comments on the manuscript.

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