

Two new species of the water mite genus *Penemideopsis* from Western Australia (Acarina: Mideopsidae)

Mark S. Harvey

Western Australian Museum, Francis Street, Perth, Western Australia 6000, Australia

Email: harveym@muswa.dialix.oz.au

Abstract – *Penemideopsis pusilla* sp. nov. and *P. angovensis* sp. nov. are each described from single males collected in southwestern Australia, and compared with *P. phreatica* from Victoria.

INTRODUCTION

The genus *Penemideopsis* was described by Cook (1986) from a single male specimen collected from interstitial deposits in eastern Victoria. This species, *P. phreatica* Cook, differed from all other mideopsids by the combined presence of a greatly enlarged tubercle and seta on the pedipalpal tibia, the possession of only three pairs of acetabula, and lobes covering the openings of leg IV (Cook 1986). The discovery of two additional specimens of *Penemideopsis* amongst collections from Western Australia made available by Dr Jenny Davis (Murdoch University) and Dr Stuart Halse (Department of Conservation and Land Management) has significantly expanded the geographic distribution of the genus, and these species differ in small but significant ways from the type species. The Western Australian specimens are described here and compared with *P. phreatica*.

These two new species of *Penemideopsis* represent the second genus of small, presumably interstitial, mideopsid reported from Western Australia. Like each of the species described here, the first, *Tillia davisae* Harvey, has been collected only once (Harvey 1990).

The specimens are mounted on microscope slides in glycerol gel or Hoyers mountant, and lodged in the Western Australian Museum, Perth (WAM). Nomenclature of the leg segments follows Harvey (1996).

SYSTEMATICS

Family Mideopsidae Koenike

Genus *Penemideopsis* Cook

Penemideopsis Cook, 1986: 300.

Type species

Penemideopsis phreatica Cook, 1986, by original designation.

Diagnosis

Male (modified from Cook 1986)

Pedipalp not unicate; tibia with greatly enlarged ventral seta set in large tubercle. Medial margins of coxa IV broad; projections covering openings of leg IV either greatly enlarged or small. Swimming setae absent. Males without any pronounced modifications of the legs, presumably indicating a lack of sexual dimorphism. Three pairs of acetabula; gonopore narrow, but bulging outwards in the region of the first two pairs of acetabula.

Remarks

The discovery of two additional species of *Penemideopsis* requires a slight alteration to the generic diagnosis, as the projections covering the openings of coxa IV range from large (*P. phreatica*) to small (*P. pusilla* and *P. angovensis*).

Key to species of *Penemideopsis* (males only)

1. Projections covering openings of coxa IV large; outer coxal margins distinctly bulging
..... *Penemideopsis phreatica* Cook
Projections covering openings of coxa IV small (Figures 2, 8); outer coxal margins smooth (Figures 2, 8) 2
2. Dorsoglandularial setae situated close to glandularia (Figure 1); posterior margin of coxa IV extending past anterior margin of genital field (Figure 2)
..... *Penemideopsis pusilla* sp. nov.
Dorsoglandularial setae situated far mesal to glandularia (Figure 7); posterior margin of coxa IV not reaching anterior margin of genital field (Figure 8)
..... *Penemideopsis angovensis* sp. nov.

Penemideopsis pusilla sp. nov.

Figures 1-6

Material Examined*Holotype*

♂, Gooralong Brook, west end of Jarrahdale, Western Australia, Australia, 32°20'S, 116°03'E, 17 June 1986, M. DeHaan (WAM 95/772).

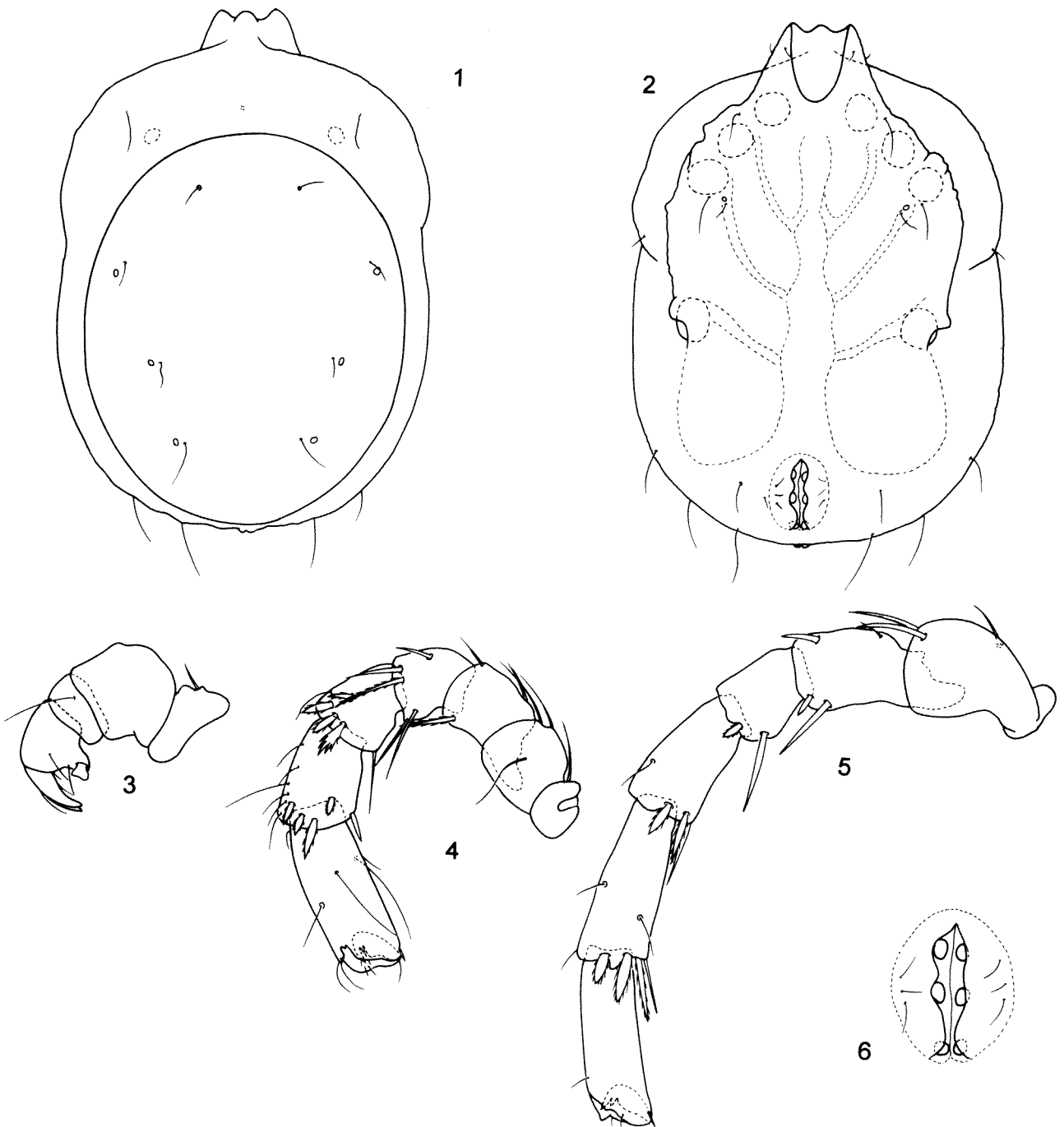
Diagnosis

Penemideopsis pusilla differs from *P. phreatica* as follows: projections covering openings of leg IV not greatly enlarged (Figure 2); capitular bay projecting far forward of ventral shield (Figure 2); outer coxal

margins not protruding (Figure 2); and its smaller size (e.g. dorsal shield 339 µm in *P. pusilla*, 395 µm in *P. phreatica*). It differs from *P. angovens* by the dorsoglandularial setae being situated close to the glandularia (Figure 1). It differs from both species by the posterior margin of coxa IV extending well past the anterior margin of the genital field (Figure 2)

Description*Male*

Dorsal and ventral shields present. Lateral eyes present; medial eye present, but very small (Figure 1). Dorsal shield (Figure 1) entire and ovoid, widest



Figures 1-6 *Penemideopsis pusilla* sp. nov., holotype ♂: 1, dorsal shield; 2, ventral shield; 3, right pedipalp; 4, right leg I; 5, right leg IV; 6, genital field.

medially; bearing 3 pairs of sub-equidistant dorsoglandularia; dorsoglandularial setae situated close to glandularia; postocularia well anterior to anterior-most glandularia of dorsal shield. Ventral shield (Figure 2) entire; vg1 situated near posterior margin of coxa II; all coxal suture lines visible, those between I and II, II and III, and III and IV posterior-laterally directed, thus forming acute angles with mid-line; medial margin of coxa IV broad; posterior margin of coxa IV rounded, extending past anterior margin of genital field; outer coxal margins not protruding; openings of leg IV covered by small ventral lobes; capitular bay deep and basally rounded, extending far forward of ventral shield; excretory pore incorporated into ventral shield. Genital field (Figure 6) with 3 pairs of small acetabula situated within field. Capitulum and chelicera basically as for *P. phreatica* (Cook 1986: figure 1611). Pedipalp (Figure 4) not uncate; tibia with large ventral projection bearing greatly enlarged spatulate seta; all setae acuminate. Legs (Figures 5, 6) not modified and without swimming setae; with very few serrate setae; claws with ventral clawlets.

Dimensions (μm) δ : dorsal shield 339/268, ventral shield 429/305. Pedipalp: trochanter 24, femur 45, patella 18, tibia 29, tarsus 31. Leg I: trochanter 52, femur 40, patella 35, tibia 40, metatarsus 50, tarsus 81. Leg IV: trochanter 64, femur 56, patella 43, tibia 60, metatarsus 79, tarsus 75.

Remarks

Despite several visits to the type locality, this species has not been recollected, and appears to be extremely rare. Davis *et al.* (1988) report that the type locality (site C) is amidst jarrah forest and urban development, and that the riparian vegetation is patchy.

Etymology

The specific epithet refers to the small size of the holotype (*pusilla* Latin, very little).

Penemideopsis angovens sp. nov. Figures 7–11

Material Examined

Holotype

δ , Angove River, north of Two Peoples Bay Nature Reserve, Western Australia, Australia, 34°55'S, 118°09'E, 5 February 1991, S.A. Halse, A.W. Storey (WAM 95/773).

Diagnosis

Penemideopsis angovens differs from *P. phreatica* as follows: projections covering openings of leg IV

not greatly enlarged (Figure 8); capitular bay projecting far forward of ventral shield (Figure 8); outer coxal margins not protruding (Figure 8); and its smaller size (e.g. dorsal shield 344 μm in *P. angovens*, 395 μm in *P. phreatica*). It differs from *P. pusilla* by the posterior margin of coxa IV not extending past the anterior margin of the genital field (Figure 8). It differs from both *P. phreatica* and *P. pusilla* by the lateral displacement of the dorsoglandularia such that the dorsoglandularial setae are situated far mesal of the glandularia (Figure 7).

Description

Male

Dorsal and ventral shields present. Lateral eyes present; medial eye present, but quite small (Figure 7). Dorsal shield (Figure 7) entire and ovoid, widest medially; bearing 3 pairs of sub-equidistant dorsoglandularia; dorsoglandularia laterally displaced such that dorsoglandularial setae situated far mesal of glandularia; postocularia well anterior to anterior-most glandularia of dorsal shield. Ventral shield (Figure 8) entire; vg1 situated near posterior margin of coxa II; all coxal suture lines visible, those between I and II, II and III, and III and IV posterior-laterally directed, thus forming acute angles with mid-line; medial margin of coxa IV broad, not extending past anterior margin of genital field; posterior margin of coxa IV rounded; outer coxal margins not protruding; openings of leg IV covered by small ventral lobes; capitular bay extremely deep and basally V-shaped, extending far forward of ventral shield; excretory pore incorporated into ventral shield. Genital field (Figure 11) with 3 pairs of small acetabula situated within field. Capitulum and chelicera basically as for *P. phreatica* (Cook 1986: figure 1611). Pedipalp (Figure 9) not uncate; tibia with large ventral projection bearing greatly enlarged spatulate seta; all setae acuminate. Legs (Figure 10) not modified and without swimming setae; without serrate setae; claws with ventral clawlets.

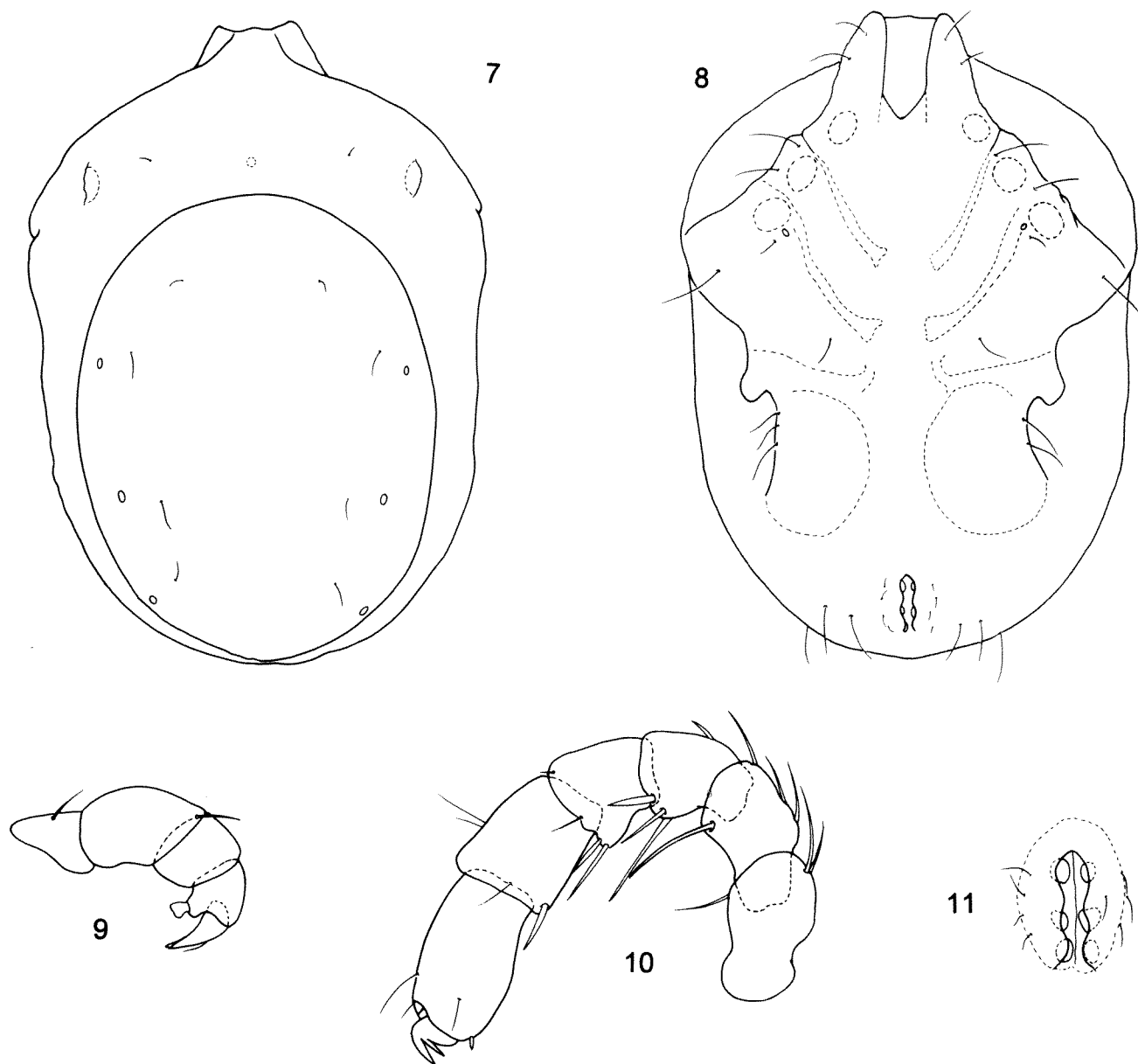
Dimensions (μm) δ : dorsal shield 344/263, ventral shield 466/336. Pedipalp: trochanter 26, femur 49, patella 20, tibia 26, tarsus 26. Leg I: trochanter 54, femur 61, patella 38, tibia 39, metatarsus 52, tarsus 69. Leg IV: trochanter 78, femur 67, patella 52, tibia 61, metatarsus 78, tarsus 79.

Remarks

Storey *et al.* (1993) provide information regarding the type locality.

Etymology

The specific epithet refers to the type locality, Angove River.



Figures 7-11 *Penemideopsis angovensis* sp. nov., holotype ♂: 7, dorsal shield; 8, ventral shield; 9, left pedipalp; 10, left leg I; 11, genital field.

ACKNOWLEDGEMENTS

I wish to cordially thank Dr Jenny Davis (Murdoch University) and Dr Stuart Halse (Department of Conservation and Land Management) for access to the fascinating specimens reported upon here.

REFERENCES

- Cook, D.R. (1986). Water mites from Australia. *Memoirs of the American Entomological Institute* 40: 1-568.
- Davis, J.A., Barmuta, L.A. and Balla, S.A. (1988). *Serpentine River aquatic fauna study*. Unpublished report submitted to Water Authority of Western Australia, Perth.
- Harvey, M.S. (1990). Two new water mite genera from south-western Australia (Acarina: Aturidae, Mideopsidae). *Memoirs of the Museum of Victoria* 50: 341-346.
- Harvey, M.S. (1996). A review of the water mite family Pionidae in Australia (Acarina: Hygrobatoidae). *Records of the Western Australian Museum* 17: 361-393.
- Storey, A.W., Halse, S.A. and Shiel, R.J. (1993). Aquatic invertebrate fauna of the Two Peoples Bay area, southwestern Australia. *Journal of the Royal Society of Western Australia* 76: 25-32.

Manuscript received 12 October 1995; accepted 16 January 1996.