

## *Pseudanapis aloha* Forster (Araneae, Anapidae) from the Eden Project in Cornwall, England

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### Summary

Both sexes of the anapid spider *Pseudanapis aloha* Forster are described from British material. The specimens were taken in the humid tropics biome at the Eden Project in Cornwall. The possible origin of the population and relationships with other species of the genus are discussed, as is its possible natural range.

### Introduction

In 2002, during the course of a survey of the invertebrate ground fauna of the humid tropic biome at the Eden Centre near St Austell in Cornwall, UK, a male and female of the anapid spider *Pseudanapis aloha* Forster were extracted from litter samples using Winkler bags. During the following year a further three males were collected and in 2004 the litter samples yielded five more males and 16 females. *Pseudanapis* is a small circum-tropical genus with 10 described species (Platnick, 2006). Both sexes of this species are described here from the British material. All measurements are in mm. Abbreviations used: AMNH = American Museum of Natural History, New York; BMH = Bishop Museum, Hawaii; NHM = Natural History Museum, London.

### *Pseudanapis aloha* Forster, 1959 (Figs. 1–8)

*Pseudanapis aloha* Forster, 1959: 315, figs. 106–110 (D♂).  
*Gossiblemma yapensis* Roewer, 1963: 129, fig. 9e–i (D♂♀).  
*Pseudanapis aloha*: Suman, 1967: 25, figs. 11–16 (♂, D♀); Shear, 1978: 8 (syn.).

**Material examined:** Holotype ♂ from Hawaii, Oahu (Van Zwaluwenburg), AMNH. 1♂, Oahu, East–West Center, litter by stream, 4 July 1964 (BMH); 3♀, Oahu, Makiki Heights Road, behind Government nursery, leaf litter by stream, 19 June 1964 (BMH); 2♂ 3♀, Oahu, University of Hawaii campus, ex leaf litter, 1965 (BMH). 1♂, Cape Tribulation National Park, 30 m (evergreen rain forest), north of Cairns, N. Queensland, Australia, 19–26 July 1992 (P. J. Schwendinger coll.). 1♂ 1♀, humid tropics biome, Eden Project, Cornwall, UK, 18 September 2002, extracted from litter samples (Winkler bags); 3♂, same locality, 2 June 2003; 5♂ 16♀, same locality, 22 October 2004 (NHM, P. Smithers & R. Snazell colls.).

**Male:** Total length ( $n=4$ ): 0.76–0.80. Carapace (Fig. 1): Length 0.41–0.43, width 0.37–0.38. Pale orange-brown. Cephalic region raised (carapace height/width

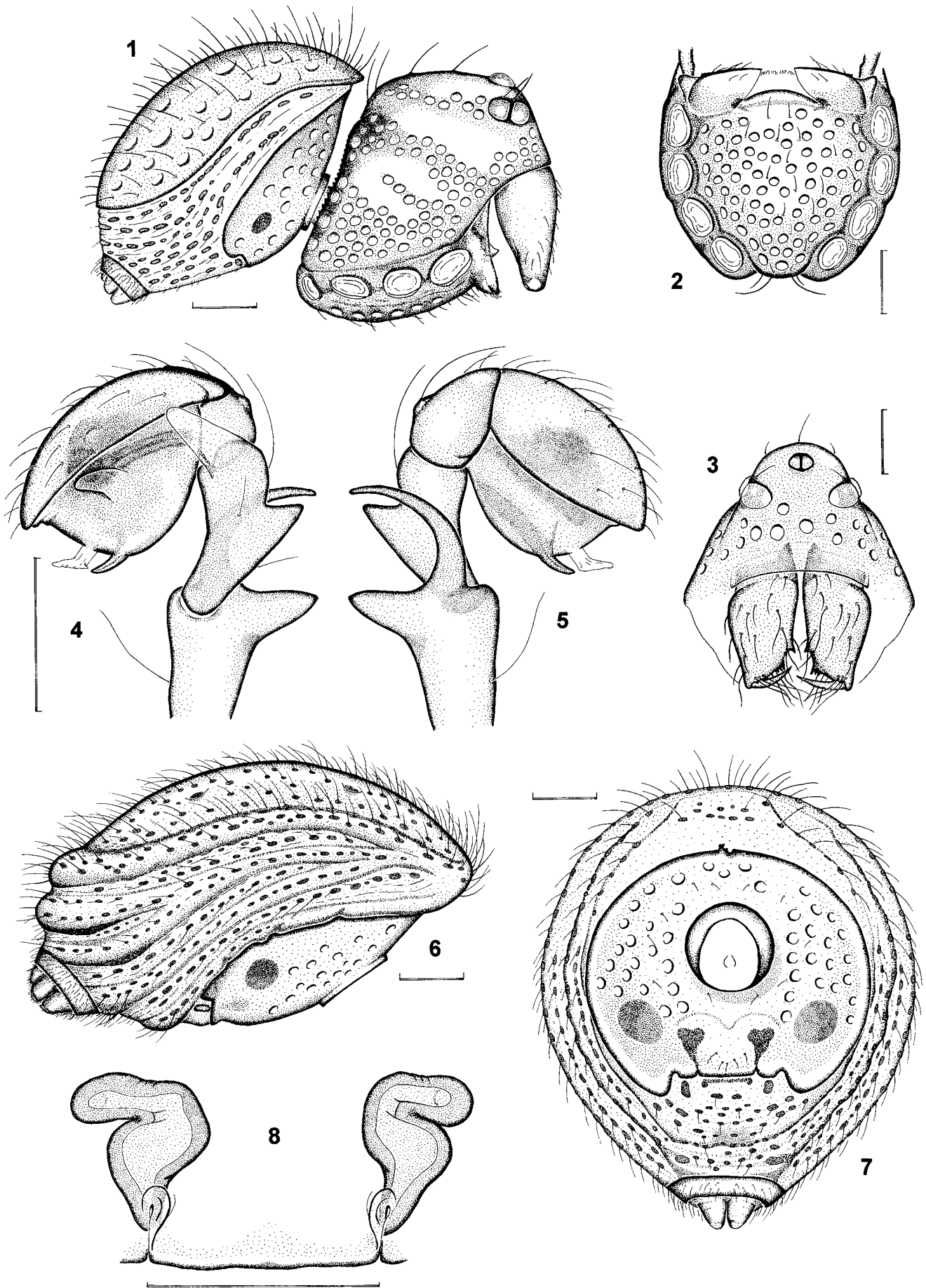
0.7). Thoracic region mostly covered with irregular pattern of shallow circular depressions. Cephalic region with some irregular rows of shallow circular depressions. Clypeus wide, with some shallow circular depressions,  $2 \times$  width of ALE. Two forward-curving hairs on midline of carapace, a smaller hair postero-lateral to the second of these. A strong inward-curving hair originating between ALE and PLE. Posterior face of carapace with 2 irregular rows of fine tubercles. Eyes: 6, in 3 pairs. ALE and PLE round, touching, subequal. PME small (0.5 width of ALE), oval, contiguous. Chelicerae (Fig. 3): Inner margin with 3 teeth on common base; proximally a larger single tooth on a protuberance. Sternum (Fig. 2): Orange, oval, rounded projection between coxae IV separating them by their diameter; covered with shallow circular depressions and some short hairs; joined to carapace to form distinct coxal sockets. As on carapace and abdominal scuta exact placement of circular depressions shows considerable variation between individual specimens. Labium: Orange, oval, fused with sternum. Legs: I=IV, II, III; pale yellow. A single strong bristle distally on all patellae; 2 strong erect hairs on all tibiae; 3 tarsal claws present. Tarsal organ present on all tarsi, dorsally at  $c. 0.1$ . Leg measurements:

	Tr	Fe	Pa	Ti	Mt	Ta	Total
I	0.05	0.32	0.12	0.20	0.12	0.23	1.04
II	0.04	0.25	0.12	0.18	0.11	0.23	0.93
III	0.04	0.21	0.10	0.16	0.09	0.20	0.80
IV	0.04	0.28	0.10	0.22	0.13	0.23	1.00

Abdomen (Fig. 1): Length 0.48–0.53, width 0.43–0.5. Yellow with complete dorsal scutum, an anterior scutum surrounding pedicel, and a sclerotised ring surrounding anal tubercle and 3 pairs of spinnerets. Dorsal scutum pale orange, shiny, with some strong curved hairs and 4 faint impressed dots. Unsclerotised areas greyish yellow, coriaceous, with many small sclerotised spots, arranged in concentric lines both laterally and posteriorly, many of these spots carrying a single hair. Anterior spinnerets largest, median spinnerets smallest, colulus missing. Book lungs missing, replaced by tracheae. Posterior tracheal spiracle also missing. Palp: (Figs. 4, 5): Femur with 2 distal apophyses, one dorsal and conical, the other long, thin and curving backwards prolaterally to patella. Patella with median dorsal apophysis and translucent blade-like distal apophysis. Bulb rounded with short, broad embolus and accompanying thin, flattened, transparent process. Conformation of sperm ducts within genital bulb extremely indistinct.

**Female:** Total length ( $n=5$ ): 0.83–0.9. Carapace: Length 0.44–0.46, width 0.36–0.38. As in male, orange, but cephalic region rather less raised. Eyes, chelicerae and sternum: As in male. Palp: Much reduced, only two small segments distal to femur. Legs: I=IV, II, III. As in male but relatively shorter. Measurements:

	Tr	Fe	Pa	Ti	Mt	Ta	Total
I	0.05	0.32	0.14	0.22	0.13	0.26	1.12
II	0.05	0.29	0.13	0.20	0.13	0.24	1.04
III	0.04	0.26	0.12	0.18	0.10	0.20	0.90
IV	0.04	0.30	0.13	0.26	0.13	0.26	1.12



Figs. 1-8: *Pseudanapis aloha* Forster. **1** Male, lateral view (legs and palp removed); **2** Male sternum; **3** Cephalothorax, anterior view; **4** Male left palp, ectal view; **5** Male left palp, mesal view; **6** Female abdomen, lateral view; **7** Female abdomen, ventral view; **8** Vulva, dorsal view. Scale lines=0.1 mm.

Abdomen (Figs. 6, 7): Length 0.55–0.58, width 0.53–0.56. Subspherical when gravid, otherwise similar in shape to male. Lacks dorsal scutum of male. Pale orange anterior scutum present. Pale orange sclerotised ring round spinnerets. Unsclerotised areas pale yellowish grey, coriaceous, with many small sclerotised spots, both ventrally and laterally arranged in concentric lines, many carrying a single hair. In non-gravid females a series of pronounced folds run laterally around abdomen; these disappear as abdomen enlarges following fertilisation of eggs. Dorsally 4 sclerotised impressed dots. Epigyne (Fig. 7): Very indistinct; a pair of shallow depressions in anterior scutum close to its posterior edge above spermathecae. Vulva (Fig. 8).

**Distribution:** *Pseudanapis aloha* was originally described from Oahu, one of the Hawaiian Islands, and the majority of records have been from there. There is also a record from Yap Island in the Western Caroline Islands (as *Gossiblemma yapensis* Roewer: synonymised with *P. aloha* by Shear (1978)), and more recently a single male of the species has been recorded from Cape Tribulation, Queensland, Australia. As stated by Platnick & Forster (1989), no conclusions can be drawn as to the natural range of *P. aloha*. Unfortunately it is impossible to ascertain the original provenance of the founder specimens of *P. aloha* at the Eden Project or how they arrived in the biome. The plant species in the humid tropics biome at the Eden Project have been imported from tropical habitats on all continents and some have been propagated at various specialist horticultural centres in the UK, Europe and the USA. While there is no information on the origin of most of the bamboo and cocoa species (among which *P. aloha* was found), specimens of *Bambusa ventricosa* are known to have been imported from China via the Netherlands and *Derris elliptica* came from India via the USA.

**Occurrence at Eden Project:** The British specimens were extracted from litter samples taken from leaf litter in a small plantation of cocoa containing *Gliricidia sepium*, *Theobroma cacao* and *Derris elliptica* and a grove of bamboos (*Bambusa vulgaris*, *B. ventricosa*, *B. multiplex*, *Dendrocalmus strictus* and *D. asper*).

Other exotic species of spider found in the biome were: *Spermophora kerinci* Huber, a newly described pholcid species from western Sumatra and Bali (Huber, 2005); *Ischnothyreus ?velox* Jackson, an oonopid originally from the Seychelles which has been introduced to Europe; *Triaeris stenaspis* Simon, a new world oonopid which has been introduced to European glasshouses; *Nesticella mogera* (Yaginuma), a nesticid recorded from Azerbaijan, China, Korea, Japan, Hawaii and Fiji; *Hasarius adansoni* (Audouin), a salticid which has been found in many British tropical glasshouses.

## Discussion

Since the genus *Pseudanapis* was first erected by Simon (1905) for the species *P. parocula* (Simon, 1899), 27 species have been added by various authors, Brignoli (1981), Forster (1958, 1959, 1974), Kropf (1995) and Platnick & Shadab (1979). However, 18 of these species

have subsequently been either transferred to other genera or placed in synonymy, leaving 10 species of *Pseudanapis* under the present definition (Platnick, 2006):

*P. aloha* Forster, 1959; from Hawaii, Caroline Is. and Queensland.

*P. benoiti* Platnick & Shadab, 1979; from Congo.

*P. domingo* Platnick & Shadab, 1979; from Ecuador.

*P. gertschi* (Forster, 1958); from Mexico to Panama.

*P. hoeferi* Kropf, 1995; from Brazil.

*P. parocula* (Simon, 1899); from Malaysia, Sumatra and Java.

*P. plumbea* Forster, 1974; from Congo.

*P. schauenbergi* Brignoli, 1981; from Mascarene Is.

*P. serica* Brignoli, 1981; from Hong Kong.

*P. wilsoni* Forster, 1959; from New Guinea.

It is probable that the genus is still polyphyletic and a few species will eventually be removed to other genera.

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