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The Goblin Spiders of the New Endemic Australian Genus *Cavisternum* (Araneae: Oonopidae)

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ABSTRACT

The new endemic Australian goblin spider genus *Cavisternum*, gen. nov., is described with 19 new species: *C. bagleyae*, *C. barthorum*, *C. bertmaini*, *C. carae*, the type species *C. clavatum*, *C. digweedi*, *C. ewani*, *C. foxae*, *C. gatangel*, *C. heywoodi*, *C. hughesi*, *C. ledereri*, *C. maxmoormanni*, *C. mayorum*, *C. michaelbellomoi*, *C. noelashpherdiae*, *C. rochesterae*, *C. toadshow*, and *C. waldockae*. A key is provided for all *Cavisternum* species known to date. Males of the genus *Cavisternum* possess a highly modified sternum, which is strongly concave and covered with clavate setae, and the cheliceral fangs are elongate with broad tips. The genus is found in tropical northern Australia and shows high endemism, with most species recorded from a single location.

INTRODUCTION

With over 490 described species in 72 genera and about 2500 expected species worldwide (Platnick, 2008), the Oonopidae are a mega-diverse spider family. These small spiders (0.5–4.0 mm), commonly known as goblin spiders, are frequently found in most terrestrial habitats, including in litter, under bark, and even in forest canopy. The Australian goblin spider fauna is

most diverse in the tropical and subtropical regions, but species occur over the whole of mainland Australia as well as Tasmania. To date only nine genera with 16 indigenous species are described in the genera *Camptoscaphiella*, *Gamasomorpha*, *Grymeus*, *Ischnothyreus*, *Oonops*, *Opopaea*, *Orchestina*, *Pelcinus*, and *Xestaspis* (Harvey, 1987; Harvey and Edward, 2007; Edward and Harvey, 2009; Hickman, 1932, 1950; Koch, 1873; Ott and Harvey, 2008a,

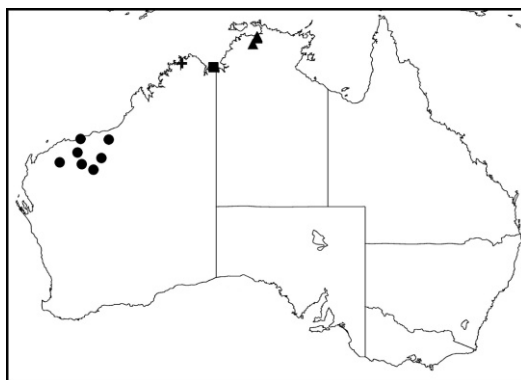
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2008b; Rainbow, 1920; Simon, 1908), as well as the introduced species *Oonops pulcher* Templeton, 1835, which is recorded from Tasmania (Hickman, 1979). Our examination of Australian museum collections indicates that there are at least 500 new species in various genera, including several new genera.

Amongst these new taxa awaiting description are a series of species united by the peculiar morphology of the male mouthparts and sternum. In particular, the fangs are elongated with broadened tips and the sternum bears a concave depression covered with clavate setae. Our description of this new genus and the numerous species that we recognize is the first Australian goblin spider genus to be fully treated as part of the worldwide revision of the family Oonopidae conducted by the "Goblin Spider Planetary Biodiversity Inventory (PBI)" project (see <http://research.amnh.org/oonopidae/>). Spiders of this new genus are small and pale in coloration, and have been found in pitfall trap samples and litter extractions. They occur over much of northern Australia (maps 1–6) and further species can be expected from areas that have yet to be sampled for small spiders. The majority of locations from which these spiders originate are low rainfall sites with open woodland vegetation. They do not appear to be found in rainforest or vine thicket habitats, and generally fit the model of taxa that have adapted to arid environments within Australia, which began dominating Australian ecosystems since the mid-Tertiary (Byrne et al., 2008). Most species are short-range endemics with distributions much less than 10,000 km² (Harvey, 2002), although two species (*C. clavatum* and *C. ewani*) possess wider distributions and are not as restricted in distribution. The discovery of an entirely new genus of spiders from northern Australia with numerous new species is not particularly surprising, as comprehensive revisions of ground-dwelling spiders over recent years have uncovered a plethora of new taxa—at both the generic and species level—in a wide variety of spider families (e.g. Baehr, 2005; Baehr and Churchill, 2003; Forster and Platnick, 1985; Framenau and Yoo, 2006; Gray and Smith, 2002, 2004, 2008; Harvey, 1995; Platnick and Forster, 1989; Platnick, 2000, 2002; Platnick and Baehr, 2006; Raven, 1990, 1994; Rix, 2006; Raven and Stumkat, 2005).

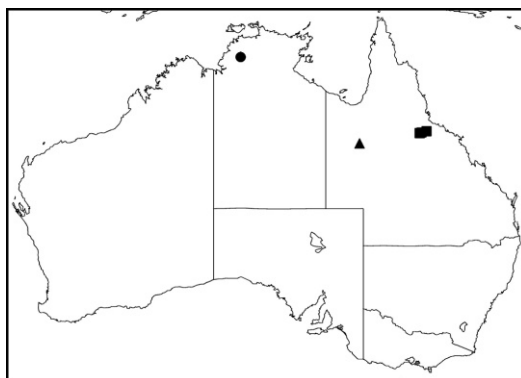


Map 1. Distribution of four new *Cavisternum* species in Australia. *C. clavatum* (●), *C. waldockae* (■), *C. digweedi* (▲), *C. bertmaini* (+).

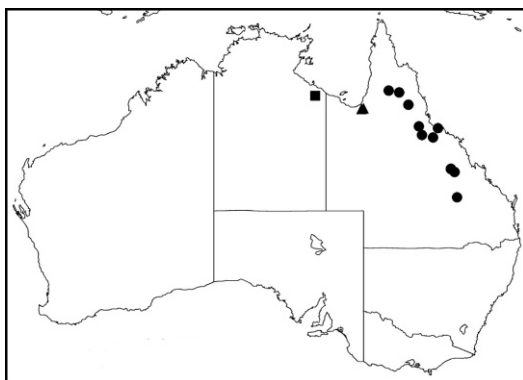
This is in contrast with larger, more conspicuous spiders such as orbweaving spiders where new species are less frequently encountered (e.g. Harvey et al., 2007; Smith, 2006).

MATERIAL AND METHODS

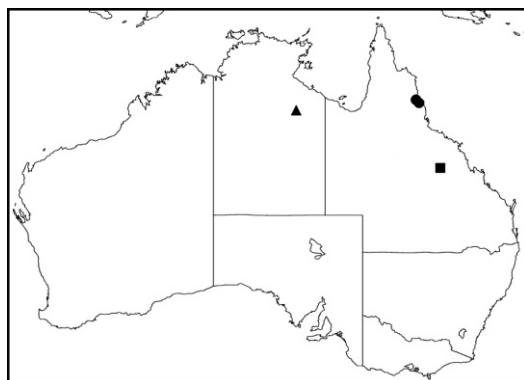
Specimens were examined using a LEICA MZ16A microscope. Photomicrographic images were produced using a Leica DFC 500 and the software program AutoMontage Pro Version 5.02 (p). Specimen parts were prepared for scanning electron microscopy by dehydration through stages of 75% to 100% ethanol and then critical point drying. SEM's were taken with a



Map 2. Distribution of three new *Cavisternum* species in Australia. *C. carae* (●), *C. michaelbellomoi* (■), *C. barthorum* (▲).



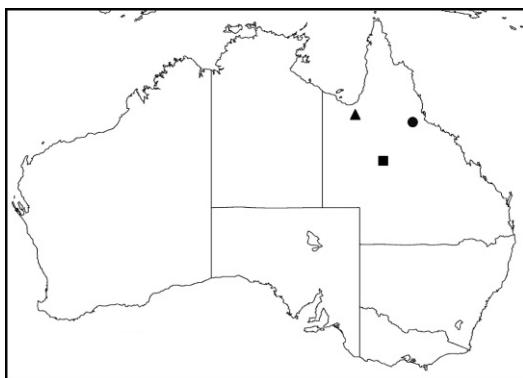
Map 3. Distribution of three new *Cavisternum* species in Australia. *C. ewani* (●), *C. noelashepherdiae* (■), *C. toadshow* (▲).



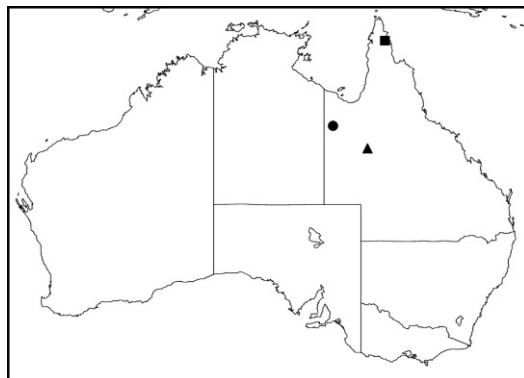
Map 5. Distribution of three new *Cavisternum* species in Australia. *C. heywoodi* (●), *C. rochesteriae* (■), *C. maxmoormanni* (▲).

Zeiss Evo LS15 incorporating a Robinson backscatter detector. Descriptions were generated with the aid of the PBI descriptive goblin spider database and shortened where possible. Maps were created with Biolink version 1.5 (CSIRO Entomology, Canberra, Australia). Drawings are of the left palp. All measurements are in millimeters. Scales of drawings are 0.1 mm, scales of SEM images are given in the caption. Abbreviations are used in the text and figures as follows: ALE, anterior lateral eyes; ALS, anterior lateral spinnerets; CD, copulatory duct; EF, epigastric fold; GR, groove between tracheal spiracles; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PME, posterior median eyes; PMS, posterior median spinnerets; TS, tracheal spiracles.

The specimens examined for this study come from the collections of the Australian Museum, Sydney (AM); Queensland Museum, Brisbane (QM); Western Australian Museum, Perth (WAM). Representative specimens have also been lodged in the American Museum of Natural History, New York (AMNH); California Academy of Sciences, San Francisco (CAS); Field Museum of Natural History, Chicago (FMNH); Instituto Butantan, São Paulo (IBSP); Museu de Ciências Naturais do Rio Grande do Sul, Porto Alegre (MCCN); Natural History Museum Bern, Bern (NHMB); Plant Protection Research Institute, Pretoria (PPRI); Royal Belgian Institute of Natural Sciences, Brussels (RBINS); Royal Museum for Central Africa, Tervuren (RMCA).



Map 4. Distribution of three new *Cavisternum* species in Australia. *C. ledereri* (●), *C. gatangel* (■), *C. foxae* (▲).



Map 6. Distribution of three new *Cavisternum* species in Australia. *C. mayorum* (●), *C. hughesi* (■), *C. bagleyae* (▲).

SYSTEMATICS

Family Oonopidae Simon, 1890

Cavisternum, new genus

TYPE SPECIES: *Cavisternum clavatum*, new species.

DIAGNOSIS: Males of this genus can easily be recognized and separated from all other genera by the concave sternum covered with clavate setae (figs. 7–25, 33–35, 106, 108, 147, 150), and the elongated fangs with a broadened tip (figs. 39–41, 107, 148). It is currently not possible to distinguish female specimens of *Cavisternum* from other genera.

ETYMOLOGY: The generic name is from Latin and refers to the concave sternum, which is present in males of all *Cavisternum* species. The gender is neuter.

DESCRIPTION: Small spiders, total length of males 0.98–1.25; females, 1.12–1.33.

Carapace not elevated (figs. 27–31), ovoid, anteriorly narrowed to less than $0.49\times$ its maximum width, with rounded posterolateral corners, lateral margin rebordered, surface smooth. Clypeus straight in front view and vertical in lateral view, high, ALE separated from edge of carapace by more than their radius (figs. 28, 32). Clypeus and nonmarginal pars cephalica covered with dark needlelike setae. Chilum absent. Six eyes, well developed, ALE largest, circular, PME oval, PLE circular, posterior eye row straight from above, procurved in front view (figs. 26, 28, 103, 105, 144, 146). ALE–ALE separated by less than ALE radius, ALE–PLE separated by less than ALE radius, PME–PME touching throughout most of their length, PLE–PME touching.

Sternum as long as wide, unmodified in females (fig. 29), but in males with teardrop-shaped median concavity of variable extent and position and partly to fully covered with field of clavate setae (figs. 7–25, 33–35).

Chelicerae, endites, and labium pale orange. Cheliceral teeth absent, cheliceral fangs small and medially directed in females (figs. 29, 36–38), in males fang directed posteriorly, elongated, tip widened with ridges and flanges or spikes, bent posterolaterally (figs. 39–41). Cheliceral setae dark, needlelike, evenly scattered. Labium rectangular, not fused to sternum, with anterior margin indented at middle, with three setae.

Endites not excavated distally, with serrula present in single row (fig. 39), anteromedian tip with one strong, toothlike projection in males, posteromedian part unmodified (figs. 39, 40).

Abdomen ovoid, dorsal scutum weakly sclerotized, covering full length of abdomen, pale orange, without color pattern, top and sides smooth, not fused to epigastric scutum (fig. 42). Epigastric scutum weakly sclerotized, surrounding pedicel, ventrally plain, weakly or strongly protruding; book lung covers large, ovoid, without setae; pedicel tube short, ribbed. Epigastric furrow separates epigastric scutum from postepigastric scutum (figs. 82–83). Postepigastric scutum weakly sclerotized, long, almost rectangular, covering about $\frac{3}{4}$ of abdominal length, fused to epigastric scutum in males, with long posteriorly directed lateral apodemes. Spinneret scutum present as an incomplete ring. Colulus represented by two setae. ALS and PLS with two major ampullate gland spigots, PMS with just one minor ampullate gland spigot in both sexes (figs. 73–76). Sperm pore oval, situated in front of anterior spiracles, with or without protruding extension (figs. 4–6, 42, 43).

Legs yellow, not darkened, femur IV not thickened, same size as femora I–III. Leg spines absent; tibiae I–IV with three dorsal trichobothria (figs. 44–48), metatarsi I–IV with one dorsal trichobothrium near the distal end, trichobothrial base rounded (figs. 49–52, 63–66), tarsi I–IV with drop-shaped tarsal organ and 1–2 sensillae visible in males, 3 in females (figs. 53–57, 67–70). Tarsal claws with 4 smaller teeth at inner margin and 4 larger teeth at lateral margin in males (figs. 59–62, 72) in females the inner 4 teeth are larger (fig. 58, 71).

Male palp normal, not strongly sclerotized, proximal segments, cymbium, and bulb yellow, embolus dark. Palpal trochanter normal, femur more than twice as long as trochanter, attached to basal patella, patella about as long as femur, tibia shorter than patella. Cymbium ovoid in dorsal view, completely fused with bulb without visible seam; bulb tapering apically, bearing a long, medially bent embolus (figs. 77–81).

Female palp without claw, epigastric area with unpaired copulatory duct between tracheal spiracles which is connected by groove and epigastric furrow (figs. 82–83).

REMARKS: The genus *Cavisternum* includes 19 new species. The type species is treated first,

followed by the other species in alphabetical order. The species descriptions mention only the differences from this generic description.

KEY TO SPECIES OF *CAVISTERNUM*

(females not known for *C. bagleyae*, *C. barthorum*, *C. carae*, *C. gatangel*, *C. hughesi*, *C. maxmoormanni*, *C. noelashepherdae* and *C. waldockae*)

1. Males 2
 - Females 20
2. Abdomen, epigastric scutum unmodified (fig. 5) 14
 - Abdomen, epigastric scutum protruding (figs. 4, 6) 3
3. Abdomen, epigastric scutum strongly protruding (fig. 4) 4
 - Abdomen, epigastric scutum slightly protruding (fig. 6) 9
4. Concave field of clavate setae extends the whole length of the sternum, fangs undulate (fig. 21) *C. mayorum*
 - Concave field of clavate setae extends $\frac{3}{4}$ length of sternum or less, fangs not undulate 5
5. Concave field of clavate setae shallow, extends less than $\frac{1}{4}$ length of sternum (fig. 20)
 - *C. maxmoormanni*
 - Concave field of clavate setae drop shaped extends at least $\frac{1}{2}$ length of sternum 6
6. Concave field of clavate setae drop shaped, length about $\frac{3}{4}$ of sternum (fig. 7)
 - *C. clavatum*
 - Concave field of clavate setae drop shaped, length about $\frac{1}{2}$ of sternum (figs. 12, 13, 14) 7
7. Tip of embolus bifurcate (figs. 98–100)
 - *C. digweedi*
 - Tip of embolus not bifurcate but with basal projection (figs. 90, 95) 8
8. Basal embolar projection large, rounded (figs. 90–92) *C. bertmaini*
 - Basal embolar projection tiny with sharp tip (figs. 95–97) *C. carae*
9. Concave field of clavate setae shallow extends less than $\frac{1}{4}$ length of sternum, fang tip widened (fig. 9) *C. michaelbellomoi*
 - Concave field of clavate setae extends at least $\frac{1}{2}$ length of sternum, fang tip not widened 10
10. Concave field of clavate setae extends the whole length of sternum (figs. 18, 22, 25) 11
 - Concave field of clavate setae about $\frac{1}{2}$ length of sternum (figs. 17, 23) 13
11. Anterior margin of sternal field with a row of stiff setae, fangs reduced (fig. 22)
 - *C. noelashepherdae*
 - Anterior margin of sternal field without a row of stiff setae, fangs long 12
12. Fangs aligned in a V shape, embolus tip bent retrolaterally (fig. 173) *C. waldockae*
 - Fangs crossing, embolus tip bent prolaterally (fig. 130) *C. hughesi*
13. Palpal bulb with conical projection at about $\frac{2}{3}$ length of bulb, embolus short with two additional long prongs (figs. 163–165)
 - *C. rochesteriae*
 - Palpal bulb with conical projection absent, embolus long, without two projections (figs. 123–125) *C. heywoodi*
14. Embolus with long sharp basal projection (figs. 131–135) *C. ledereri*
 - Embolus without such projection 15
15. Sternum, anterior edge of clavate field rounded (figs. 8, 11, 24) 16
 - Anterior edge of clavate field angular (figs. 10, 15, 16) 18
16. Fangs relatively short, not reaching tip of labium (fig. 11) *C. barthorum*
 - Fangs long, reaching at least tip of labium (figs. 8, 24) 17
17. Fangs cross, tips bent medially (fig. 8) *C. ewani*
 - Fangs crossed, tips bent laterally (fig. 24)
 - *C. toadshow*
18. Bare median band half as long as clavate field (fig. 16) *C. gatangel*
 - Bare median band about $\frac{3}{4}$ as long as clavate field (figs. 10, 15) 19
19. Fangs long, straight, crossed, reaching endites (fig. 15) *C. foxae*
 - Fangs short, straight, not reaching endites (fig. 10) *C. bagleyae*
20. Epigastric area with copulatory duct not reaching tracheal groove (figs. 82, 101, 134, 164, 169) 21
 - Epigastric area with copulatory duct reaching tracheal groove (figs. 113, 118, 126, 142, 156) 25
21. Epigastric area with wide semicircular rim (figs. 101, 164) 22
 - Epigastric area without semicircular rim ... 23
22. Semicircular rim thick, leading to narrow copulatory duct (figs. 101, 102) ... *C. digweedi*
 - Semicircular rim thin, copulatory duct triangular, anteriorly widened (figs. 164, 165)
 - *C. rochesteriae*
23. Epigastric area with a dark rectangular field between epigastric fold and tracheal groove (figs. 169, 170) *C. toadshow*
 - Epigastric area with a dark oval or elliptical field between epigastric fold and tracheal groove (figs. 82, 134) 24
24. Epigastric area with a longitudinal dark oval field between epigastric fold and tracheal groove (figs. 82, 83) *C. clavatum*

- Epigastric area with a dark broadly spatulate field between epigastric fold and tracheal groove (figs. 134, 135). *C. ledereri*
- 25. Posterior end of copulatory duct at level of tracheal groove (figs. 93, 113, 156). 26
- Posterior end of copulatory duct far beyond tracheal groove (figs. 118, 126, 142). 28
- 26. Epigastric area with wide, V-shaped dark field (figs. 156, 157). *C. michaelbellomoi*
- Epigastric area without wide, V-shaped dark field (fig. 113). 27
- 27. Epigastric area with wide elliptical opening just behind epigastric fold, posterior end of copulatory duct just behind tracheal groove (figs. 113, 114). *C. ewani*
- Epigastric area without elliptical opening, posterioren end of copulatory duct on level of tracheal groove (figs. 93, 94). *C. bertmaini*
- 28. Copulatory duct long and not divided into three parts (figs. 118, 142). 29
- Copulatory duct short and divided into three parts (figs. 126, 127). *C. heywoodi*
- 29. Copulatory duct long and narrow, about 3× longer than wide (figs. 118, 119). *C. foxae*
- Copulatory duct long but broader, about 2× longer than wide (figs. 142, 143).
. *C. mayorum*

***Cavisternum clavatum*, new species**

Figures 1, 4, 7, 26–83; map 1

TYPES: **AUSTRALIA:** *Western Australia:* male holotype from 7.5 km NNW of Mt. Berry, site WYE13, 22°25'29.6"S, 116°25'57.4"E, pitfall trap (10 Sep. 2003–9 Oct. 2004, CALM Pilbara Survey) (PBI_OON 00023337), deposited in WAM (T93854). Female allotype collected with holotype (PBI_OON 00023338), deposited in WAM (T93855). Paratypes: 4 males from 10.5 km NW of Mt. Berry, site WYE12, 22°24'38.6"S, 116°23'30.8"E (10 Sep. 2003–9 Oct. 2004, CALM Pilbara Survey) (PBI_OON 00004882), deposited in WAM (T67239); 7 males, 7 females from 7.5 km NNW of Mt. Berry, site WYE13, 22°25'29.6"S, 116°25'57.4"E (10 Sep. 2003–9 Oct. 2004, CALM Pilbara Survey) (PBI_OON 00004906), 1 male, 1 female deposited in each of QM S86890, AM KS106291, AMNH, CAS, remainder in WAM (T67260); 4 males, 3 females from 8.5 km WSW of Yanyare River Mouth, site DRW02, 20°50'40.6"S, 116°22'02.9"E (Oct. 2004, CALM Pilbara Survey) (PBI_OON 00004914), 1 male, 1 female deposited in each of FMNH, MCCN, RMCA, remainder in WAM (T67268).

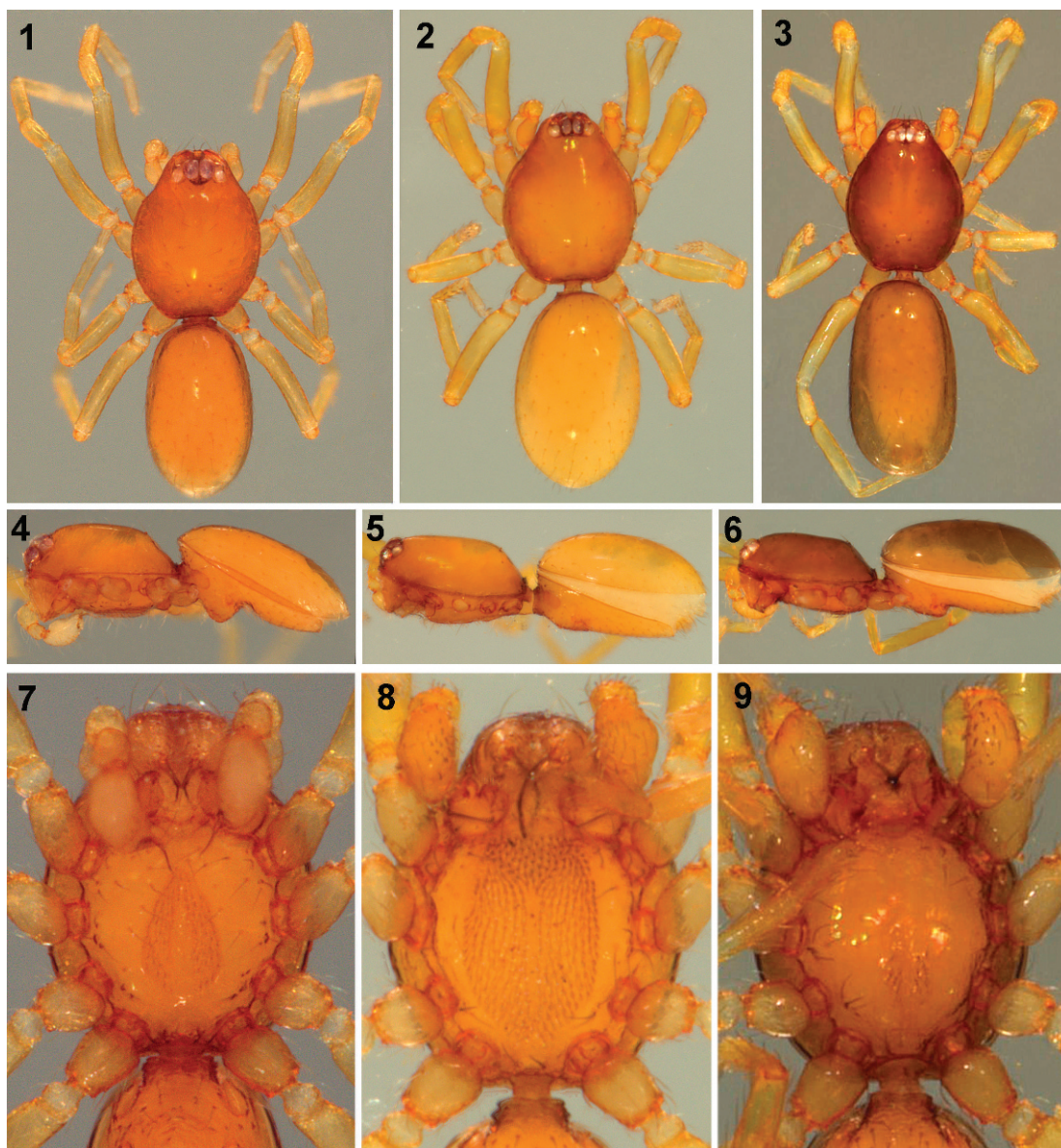
ETYMOLOGY: The adjectival specific name is Latin and refers to the club-shaped sternal setae found in males.

DIAGNOSIS: Males of *C. clavatum* resemble those of *C. bertmaini* in having the epigastric area strongly protruding (fig. 4). In *C. clavatum* the concave field of clavate setae is clearly longer than that of *C. bertmaini*, extending over about $\frac{2}{3}$ of the sternum, and teardrop shaped (fig. 7); the embolus is less curved than in *C. bertmaini* (figs. 77–81).

MALE: Total length 1.11. Carapace 0.51 long, 0.41 wide; abdomen 0.60 long, 0.33 wide. Carapace, sternum, chelicerae, endites, and labium pale orange; sternum with drop-shaped field of clavate setae covering about half of sternum width and $\frac{2}{3}$ of sternum length (fig. 7). Legs yellow. Epigastric region with strongly protruding extension (fig. 4). Palpal embolus long, slightly medially bent, with a large triangular basal projection (figs. 77–81).

FEMALE: Total length 1.26. Carapace 0.51 long, 0.40 wide; abdomen 0.75 long, 0.38 wide. Coloration as in male. Epigastric fold area, copulatory opening a broad V-shaped slit ending in a narrow copulatory duct; tracheal system with two anteriorly and posteriorly directed branches (figs. 82, 83).

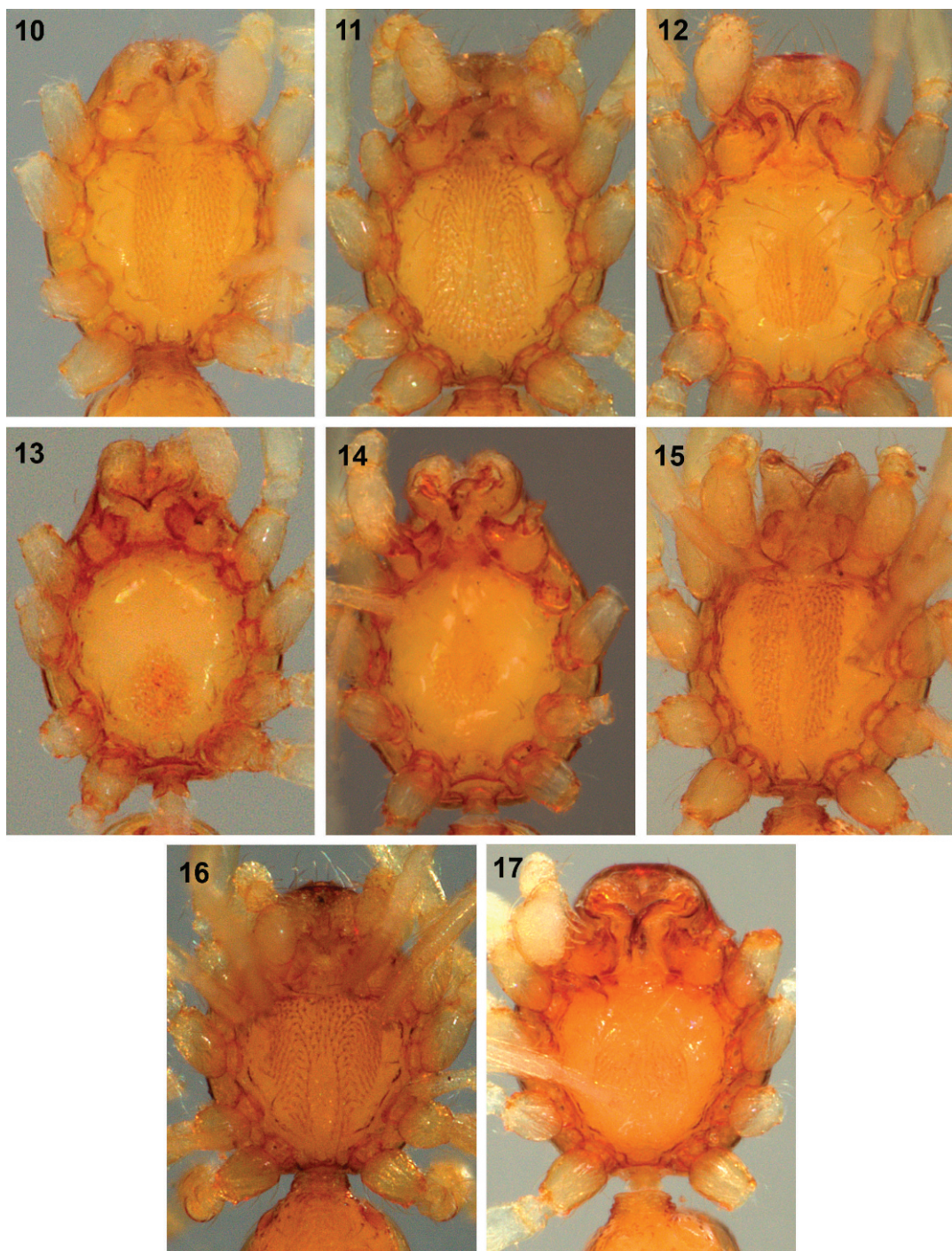
OTHER MATERIAL EXAMINED: **AUSTRALIA:** *Western Australia:* 12 km ESE of Mt Billroth, site PE10, 21°39'45"S, 117°42'17.5"E, 5 May 2004–18 May 2005, CALM Pilbara Survey, 1 ♀ (PBI_OON 00004899) (WAM T67253); 17.5 km SE of Mt Bruce, site TCMBE07, 22°42'58"S, 118°15'48"E, 1 Sep. 2005–17 Sep. 2006, CALM Pilbara Survey, 3 ♂, 1 ♀ (PBI_OON 00004904) (WAM T67258); 21 km WNW of Bonney Downs Homestead, site RHNE11, 22°05'41"S, 119°45'13"E, 7 Aug. 2003–18 Oct. 2004, CALM Pilbara Survey, 2 ♂, 3 ♀ (PBI_OON 00004889) (WAM T78367; 2 ♂, 1 ♀ SEM); 26 km WSW of Mt Marsh, site RHNW01, 22°32'06.1"S, 118°58'38.5"E, 11 Aug. 2003–19 Oct. 2004, CALM Pilbara Survey, 10 ♂ (PBI_OON 00004879), 9 ♀ (PBI_OON 00004879) (1 ♂, 1 ♀ in each of IBSP, NHMB, PPRI, RBINS, remainder in WAM T67236); 53 km NNE of Whim Creek Hotel, site DRE03, 20°25'48.6"S, 118°03'50.3"E, 8 July–2 Oct. 2003, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004887) (WAM T67243); 45 km N of Nullagine, site NW08, 21°28'47.8"S, 120°05'26.9"E, 19 May 2004–18 May 2005,



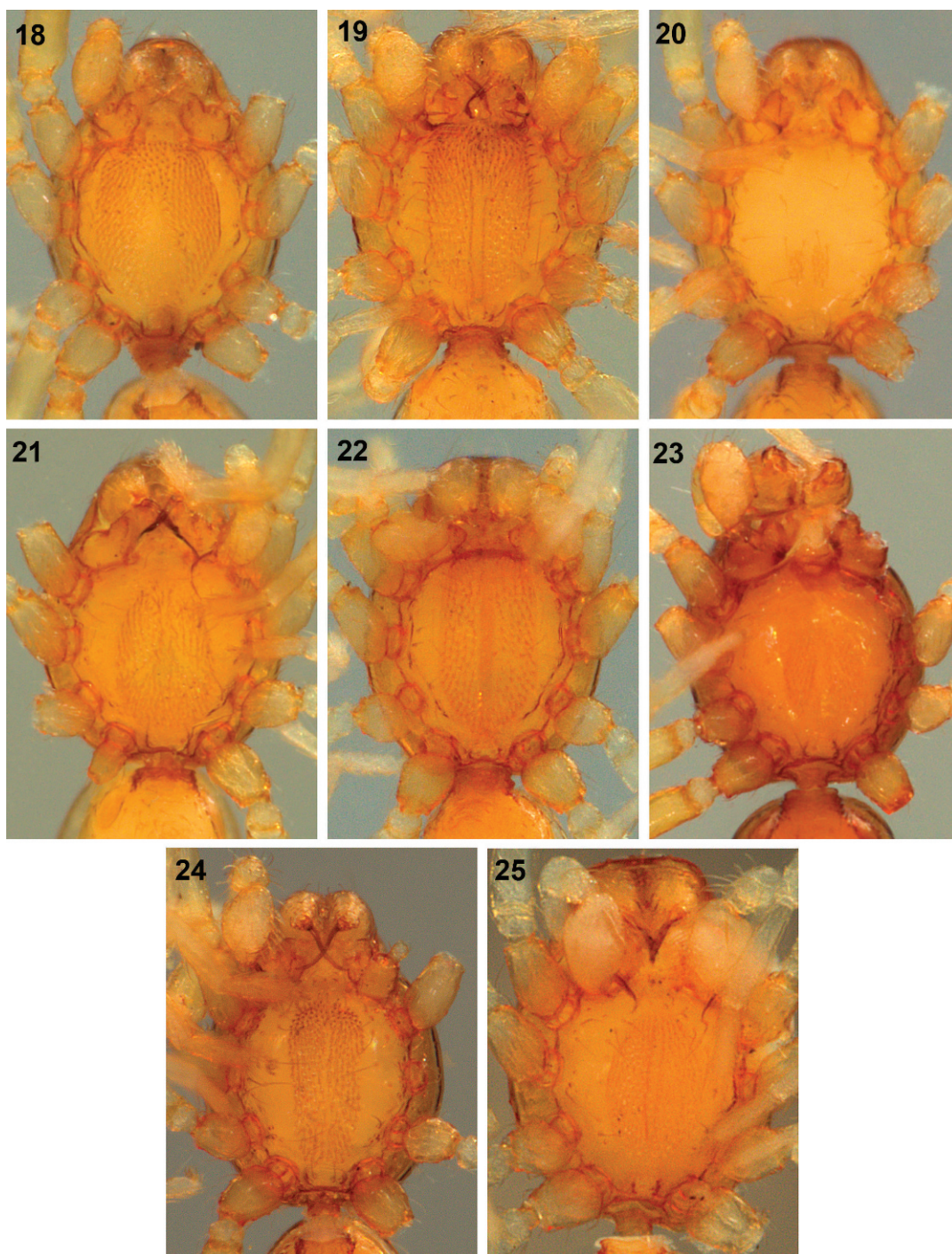
Figs. 1–9. *Cavisternum* species, males. 1–3: habitus, dorsal view; 4–6: habitus, lateral view; 7–9: sterna and chelicera, ventral view. 1, 4, 7. *C. clavatum* (PBI_OON 04906). 2, 5, 8. *C. ewani* (PBI_OON 06013). 3, 6, 9. *C. michaelbellomoi* (PBI_OON 06003).

CALM Pilbara Survey, 1 ♂ (PBI_OON 00004897), 1 ♀ (PBI_OON 00004897) (WAM T67251); 42.5 km N of Nullagine, site NW07, 21°29'57"S, 120°06'32.9"E, 3 Aug. 2003–20 Oct. 2004, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004913) (WAM T67267); 16 km N of Cowra Line Camp, site RHNW07, 22°13'18.2"S,

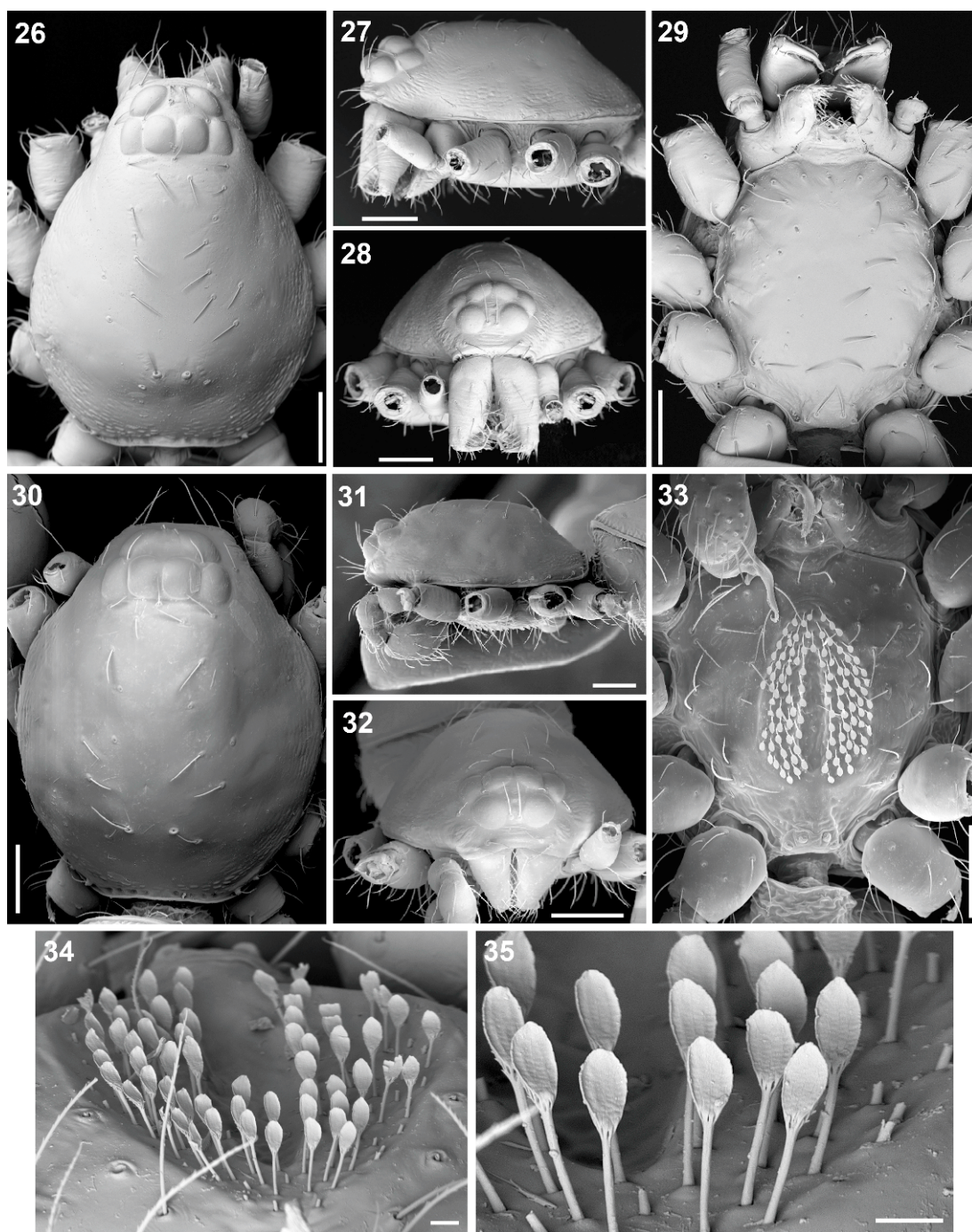
119°01'29.5"E, 14 Aug. 2003–20 Oct. 2004, CALM Pilbara Survey, 1 ♂, 1 ♀ (PBI_OON 00004891) (WAM T67246); 46 km NNE of Whim Creek Hotel, site DRE02, 20°28'32.2"S, 117°59'43.3"E, 9 July 2003–4 Oct. 2004, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004901) (WAM T67255); 26 km WNW of Bonney



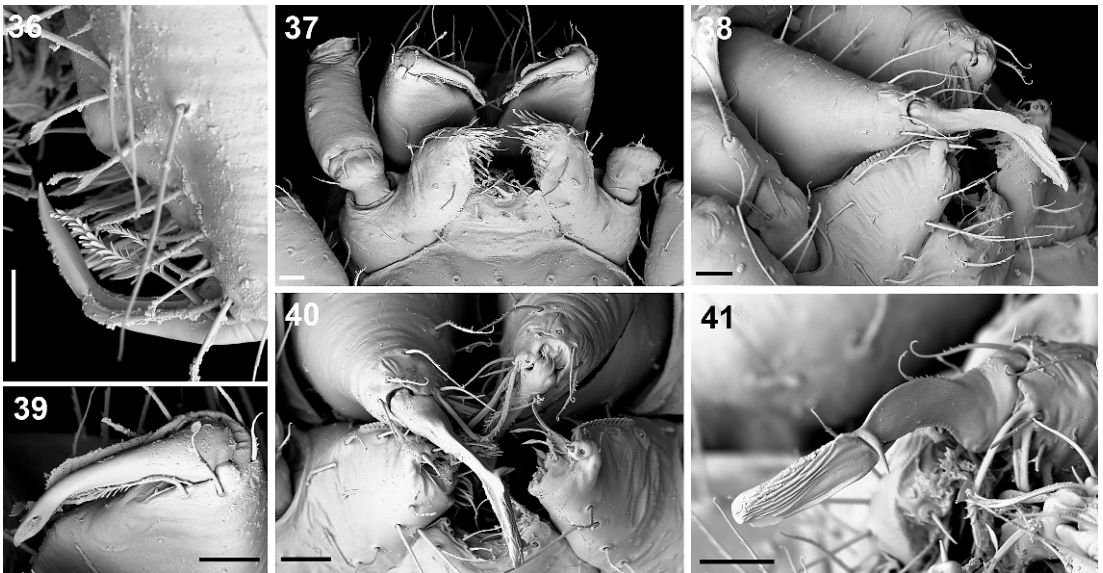
Figs. 10–17. *Cavisternum* species, males, sterna and chelicerae, ventral view. **10.** *C. bagleyae* (PBI_OON 06235). **11.** *C. barthorum* (PBI_OON 06073). **12.** *C. bertmaini* (PBI_OON 05440). **13.** *C. carae* (PBI_OON 05434). **14.** *C. digweedi* (PBI_OON 05438). **15.** *C. foxae* (PBI_OON 06069). **16.** *C. gatangel* (PBI_OON 06070). **17.** *C. heywoodi* (PBI_OON 07474).



Figs. 18–25. *Cavisternum* species, males, sterna and chelicerae, ventral view. **18.** *C. hughesi* (PBI_22901). **19.** *C. ledereri* (PBI_OON 07430). **20.** *C. maxmoormanni* (PBI_OON 06198). **21.** *C. mayorum* (PBI_OON 06167). **22.** *C. noelasherphidae* (PBI_OON 06104). **23.** *C. rocheasterae* (PBI_OON 07072). **24.** *C. toadshow* (PBI_OON 06053). **25.** *C. waldockae* (PBI_OON 05444).



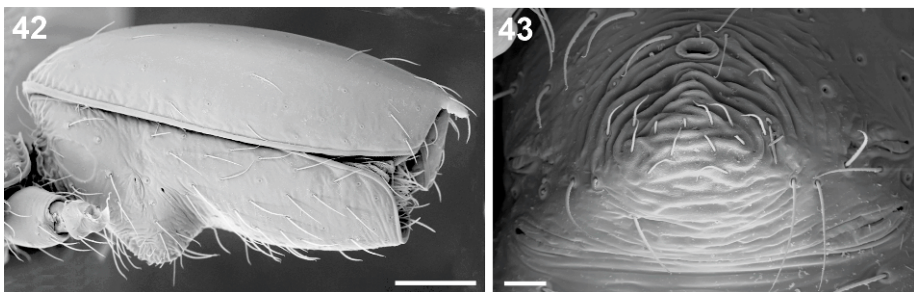
Figs. 26–35. *Cavisternum clavatum*, new species. 26. Female (PBI_OON 04903) carapace, dorsal view. 27. Female carapace, lateral view. 28. Female carapace, frontal view. 29. Female sternum, ventral view. 30. Male (PBI_OON 04906) carapace, dorsal view. 31. Male carapace, lateral view. 32. Male carapace, frontal view. 33. Male sternum, ventral view. 34. Male sternum, anterior view. 35. Male clavate setae. Scales: figs. 26–33, 100 μ m; figs. 34, 35, 10 μ m.



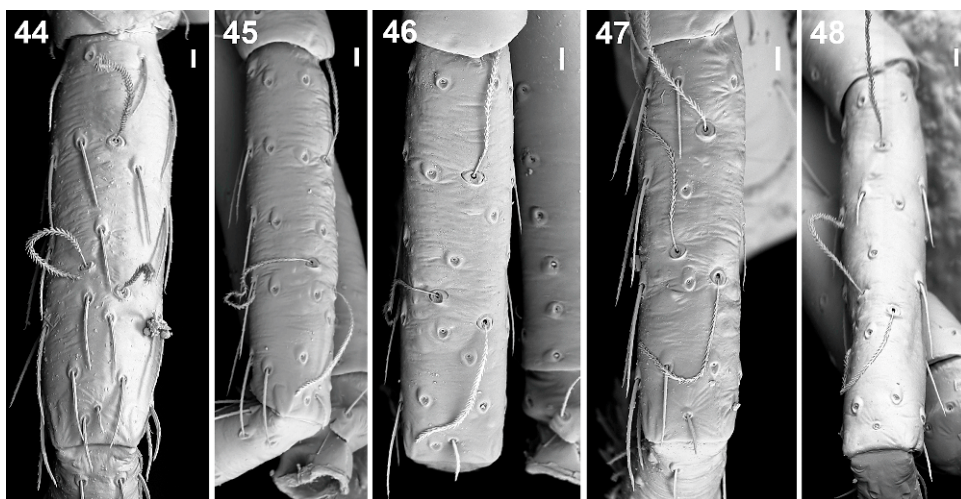
Figs. 36–41. *Cavisternum clavatum*, new species, chelicerae. 36. Female (PBI_OON 04903), dorsal view. 37. Female left fang, ventral view. 38. Female chelicerae, ventral view. 39. Male (PBI_OON 04906) chelicerae, ventral view. 40. Male right fang, retrolateral view. 41. Male right fang, prolateral view. Scales: 20 μ m.

Downs Homestead, site RHNE12, 22°05'07"S, 119°42'13"E, 8 Aug. 2003–18 Oct. 2004, CALM Pilbara Survey, 1 ♂, 1 ♀ (PBI_OON 00004895) (WAM T78314); 24.5 km N of Cowra Line Camp, site RHNW10, 22°08'04.8"S, 119°01'27.3"E, 27 Aug. 2003–20 Oct. 2004, CALM Pilbara Survey, 1 ♂, 1 ♀ (PBI_OON 00004912) (WAM T67266); 17 km SE of Karratha, site DRC04, 20°51'08"S, 116°56'40.5"E, 10 May 2004–23 May 2005, CALM Pilbara Survey, 1 ♂, 1 ♀ (PBI_OON 00004894) (WAM T67249); 10 km S of Mallina Homestead, site DRE13, 20°58'10.4"S, 118°02'54"E, 10 July 2003–3 Oct. 2004, CALM Pilbara Survey, 1 ♀ (PBI_OON

00004908) (WAM T67262); 6 km SE of Marda Pool, site DRW10, 21°04'11.8"S, 116°12'15.5"E, 25 Sep. 2003–3 Oct. 2004, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004900) (WAM T67254); 1.2 km SSE of Millstream, site PW08, 21°36'15"S, 117°04'39"E, 14 July 2003–12 Oct. 2004, CALM Pilbara Survey, 1 ♂, 1 ♀ (PBI_OON 00004892) (WAM T67247); 5 km NW of Mt. Florance Homestead, site PE08, 21°45'59.3"S, 117°49'31.2"E, 5 May 2004–18 May 2005, CALM Pilbara Survey, 2 ♂, 2 ♀ (PBI_OON 00004883) (WAM T67240); 78 km E of Meentheena Outcamp, site NE11, 21°18'15.9"S, 121°12'01.3"E, May 2004–Oct.



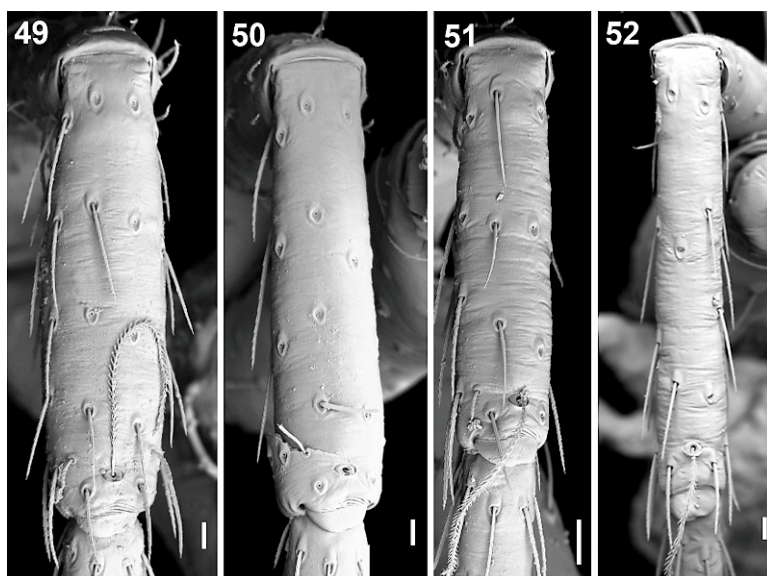
Figs. 42–43. *Cavisternum clavatum*, new species. 42. Male (PBI_OON 04906) abdomen, lateral view. 43. Male sperm pore. Scales: fig. 42, 100 μ m; fig. 43, 20 μ m.



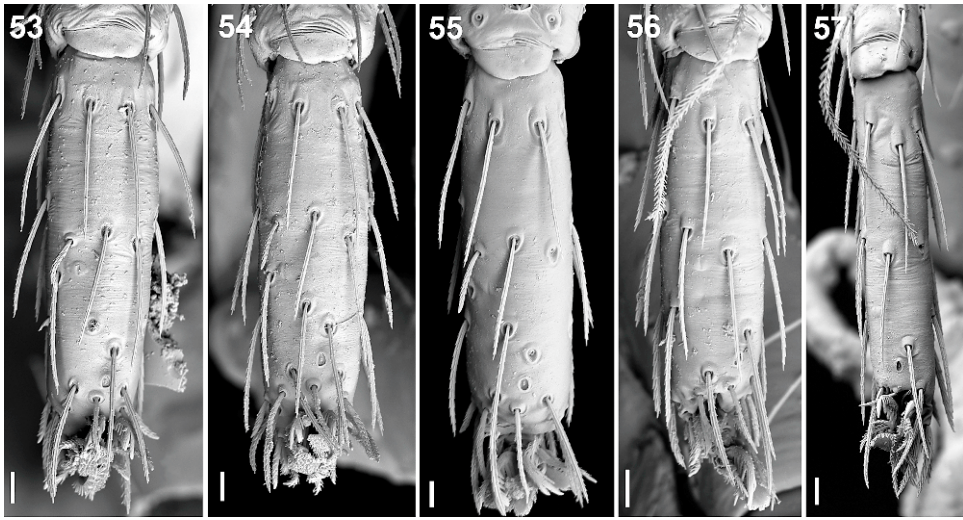
Figs. 44–48. *Cavisternum clavatum*, new species, tibiae, dorsal view. **44.** Female (PBI_OON 04903), leg I. **45.** Male (PBI_OON 04906), leg I. **46.** Male, leg II. **47.** Male, leg III. **48.** Male, leg IV. Scales: 10 μ m.

2004, CALM Pilbara Survey, 1 ♀ (PBI_OON 00004902) (WAM T67256); 12.5 km E of Pannawonica, site OYE02, 21°37'38"S, 116°26'45"E, 2 Oct. 2005–27 Sep. 2006, CALM Pilbara Survey, 2 ♂, 2 ♀ (PBI_OON 00004896) (WAM T67250); 24 km SSE of Peedamulla Homestead, site OYW03, 21°56'53"S, 115°49'48"E, 25 Sep. 2005–28 Sep. 2006, CALM Pilbara Survey, 1 ♀

(PBI_OON 00004893) (WAM T67248); 32 km E of Port Hedland, site PHYW11, 20°19'28"S, 118°55'20"E, 25 July 2005–25 Aug. 2006, CALM Pilbara Survey, 3 ♂, 2 ♀ (PBI_OON 00004903) (WAM T67257); 20 km WNW of Rhodes Ridge, site RHNC09, 23°06'11.6"S, 119°02'20"E, 1 Sep. 2003–16 Oct. 2004, CALM Pilbara Survey, 6 ♂, 2 ♀ (PBI_OON



Figs. 49–52. *Cavisternum clavatum*, new species, male metatarsi, dorsal view (PBI_OON 04906). **49.** Leg I. **50.** Leg II. **51.** Leg III. **52.** Leg IV. Scales: 20 μ m.



Figs. 53–57. *Cavisternum clavatum*, new species, tarsi, dorsal view. **53.** Female (PBI_OON 04903), leg I. **54.** Male (PBI_OON 04906), leg I. **55.** Male, leg II. **56.** Male, leg III. **57.** Male, leg IV. Scales: 10 μ m.

00004898) (WAM T67252); 33 km W of Rhodes Ridge, site RHNC08, 23°06'11.6"S, 119°02'20"E, 2 Sep. 2003–18 Oct. 2004, CALM Pilbara Survey, 3 ♂, 1 ♀ (PBI_OON 00004910) (WAM T67264); Ripon Hills Road, 47.6 km E of Nullagine turnoff (Marble Bar Road), 21°13'35"S, 120°22'08"E, 29 Mar.–23 May 2006, M. Bulbert, J. Gollan, L. Kampen, G. Carter, 1 ♂ (PBI_OON 00021622) (AM KS100138); 18 km WNW of Tom Price, site TCMBW06, 22°39'57"S, 117°36'46"E, 25 Aug. 2005–23 Sep. 2006, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004890) (WAM T67245); 6 km ENE of Tom Price, site TCMBE12, 22°40'48"S, 117°50'52"E, 3 Aug. 2005–18 Sep. 2006, CALM Pilbara Survey, 1 ♀ (PBI_OON 00004885) (WAM T67241); 10 km SSE of Wheelarra, site BDRS08, 23°27'30"S, 120°09'21"E, 7 Sep. 2005–10 Aug. 2006, CALM Pilbara Survey, 1 ♀ (PBI_OON 00004909) (WAM T67263); 45 km NE of Whim Creek Hotel, site DRE07, 20°36'26.6"S, 118°9'23.8"E, 7 July 2003–4 Oct. 2004, CALM Pilbara Survey, 1 ♂, 4 ♀ (PBI_OON 00004905) (WAM T67259); 11 km N of Wodgina, site MBW08, 21°04'18"S, 118°40'47"E, 23 Sep. 2005–13 Sep. 2006, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004881) (WAM T67238); 15 km NNE of Wodgina, site MBW07, 21°03'49"S, 118°45'39"E, 23 Sep. 2005–13 Sep. 2006, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004886)

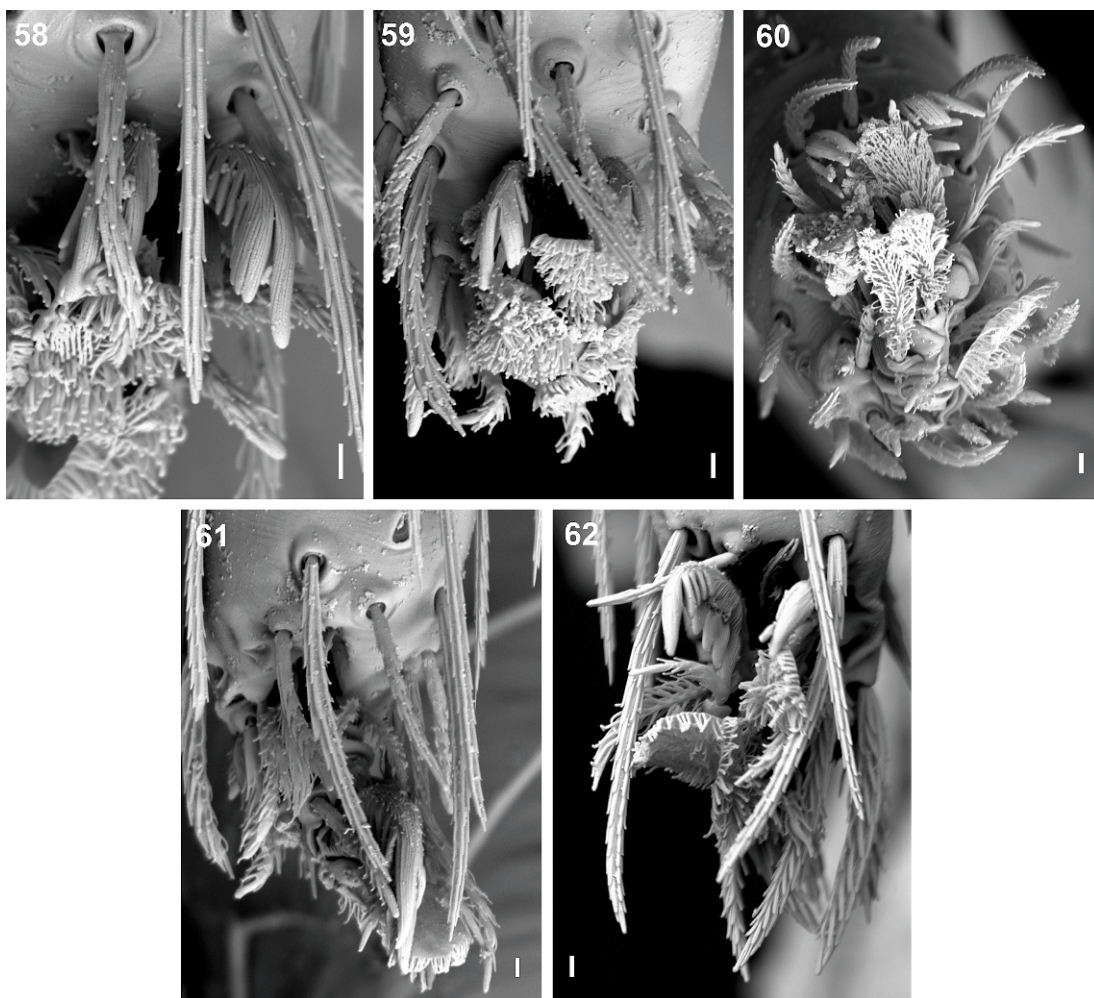
(WAM T67242); 11 km N of Wodgina, site MBW08, 21°04'18"S, 118°40'47"E, 23 Sep. 2005–13 Sep. 2006, CALM Pilbara Survey, 3 ♂, 1 ♀ (PBI_OON 00004888) (WAM T67244); 20 km ENE of Wodgina, site MBW06, 21°06'53"S, 118°51'06"E, 23 Sep. 2005–13 Sep. 2006, CALM Pilbara Survey, 1 ♀ (PBI_OON 00004880) (WAM T67237); 20.5 km ESE of Yarrie Homestead, site PHYE11, 20°46'01"S, 120°22'36"E, 4 July 2005–20 Aug. 2006, CALM Pilbara Survey, 1 ♂ (PBI_OON 00004911) (WAM T67265); Hamersley Station, Nanutarra–Wittenoom Road, c. 25 km NE of Railway Road, 22°21'21"S, 117°54'16"E, 12–17 Aug. 2005, CVA Volunteers, 1 ♂ (PBI_OON 00006541) (AM KS100485); Woodstock Station, site WS4, 21°36'34"S, 118°58'28"E, 10–17 Feb. 1989, J. Dell, R.A. How, J.M. Waldock, 1 ♂ (PBI_OON 00005436) (WAM T91/577).

DISTRIBUTION: This species is widely distributed in the western part of Western Australia, especially in the Pilbara region (map 1).

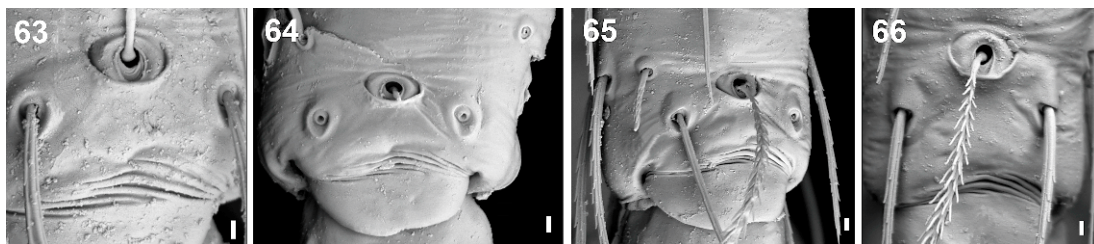
Cavisternum bagleyae, new species

Figures 10, 84–86, map 6

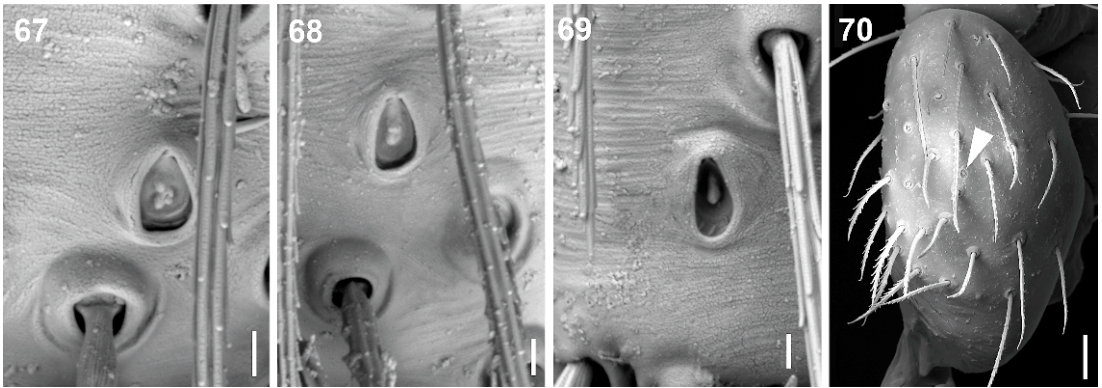
TYPE: **AUSTRALIA:** *Queensland:* Male holotype from just west of Gilliat Creek, 25 km SE of McKinlay, 21°24'18"S,



Figs. 58–62. *Cavisternum clavatum*, new species, tarsal claws. **58.** Female (PBI_OON 04903), leg I. **59.** Male (PBI_OON 04906), leg I. **60.** Male, leg II. **61.** Male, leg III. **62.** Male, leg IV. Scales: 2 μ m.



Figs. 63–66. *Cavisternum clavatum*, new species, male metatarsal trichobothria (PBI_OON 04906). **63.** Leg I. **64.** Leg II. **65.** Leg III. **66.** Leg IV. Scales: 2 μ m.



Figs. 67–70. *Cavisternum clavatum*, new species. tarsal organ, dorsal view. **67.** Female (PBI_OON 04903), leg I. **68.** Male (PBI_OON 04906), leg I. **69.** Male, leg IV. **70.** Male, palp (arrowed). Scales: figs. 67–69, 2 μ m; fig. 70, 20 μ m.

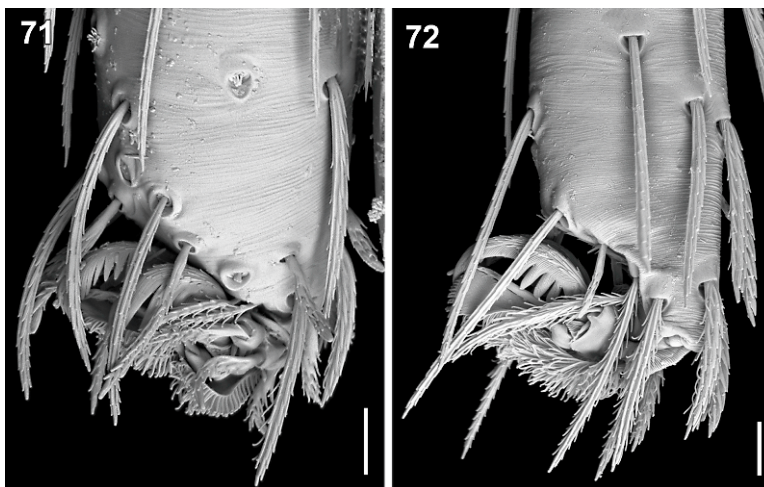
141°32'00"E, 202 m (29 June–8 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006235), deposited in QM (S75302).

ETYMOLOGY: This specific name is a patronym in honor of Alison Robyn Mellor, née Bagley, so her maiden name may live on in a manner that reflects her love of nature.

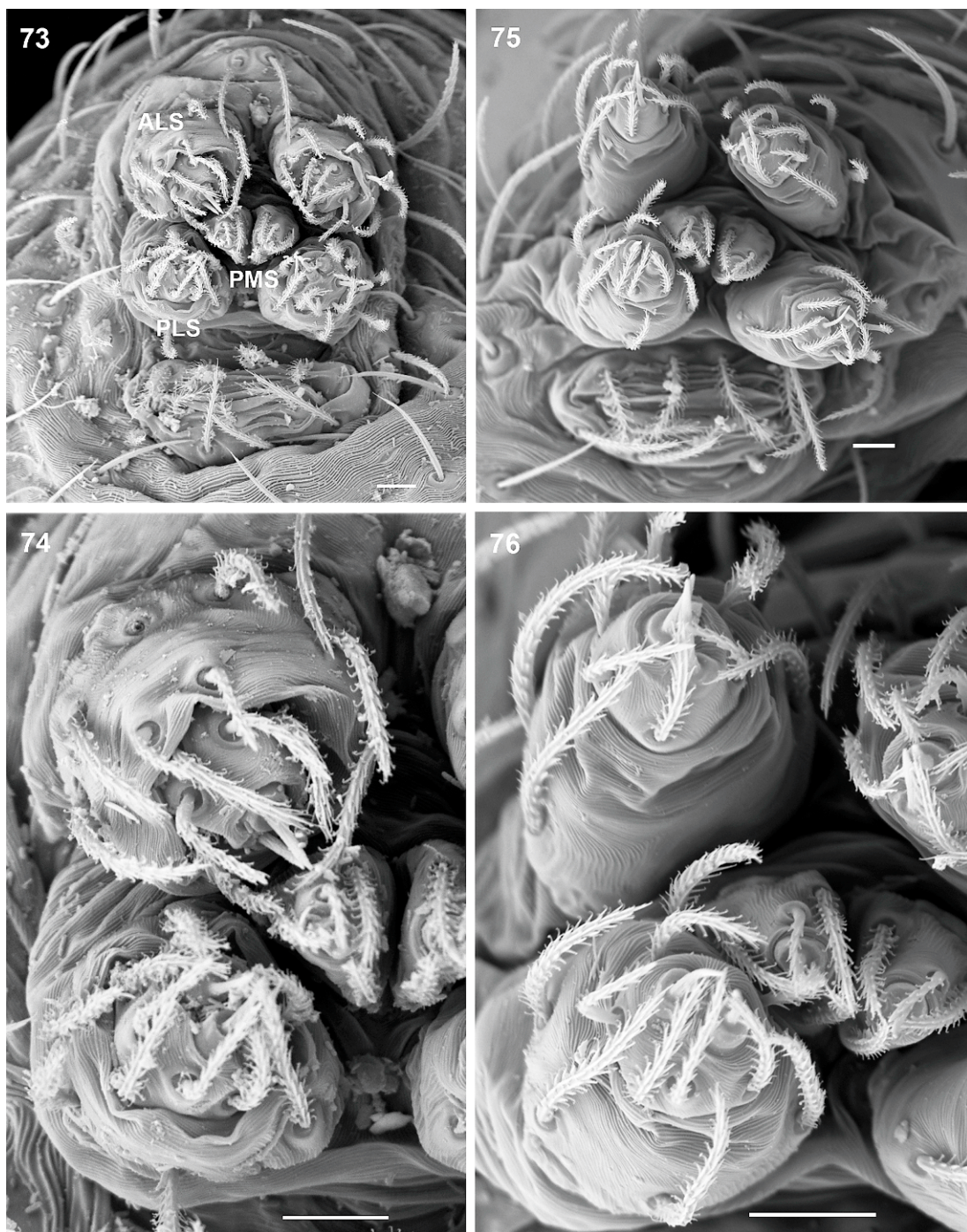
DIAGNOSIS: Males of *C. bagleyae* resemble those of *C. barthorum*, with the sternal concavity occupying the whole sternal length (fig. 10) and the epigastric scutum not protruding. In males of *C. bagleyae*, the cheliceral fangs are shorter, directed medially, and the

ventral patch of sternal setae is more rectangular anteriorly (fig. 10).

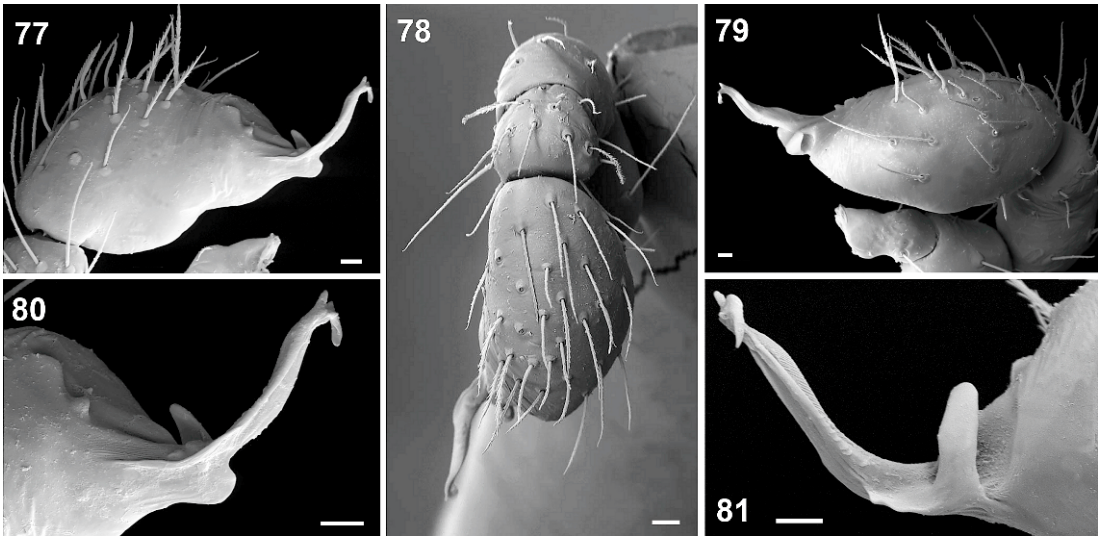
MALE: Total length 1.11. Carapace 0.50 long, 0.39 wide; abdomen 0.61 long, 0.28 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide with field of clavate setae covering about $\frac{4}{5}$ of sternal length and about $\frac{1}{2}$ of sternal width, bare median band elongate oval, anterior margin rectangular (fig. 10). Cheliceral fangs short, not reaching labium, directed medially, tips not distally widened. Abdomen cylindrical, epigastric scu-



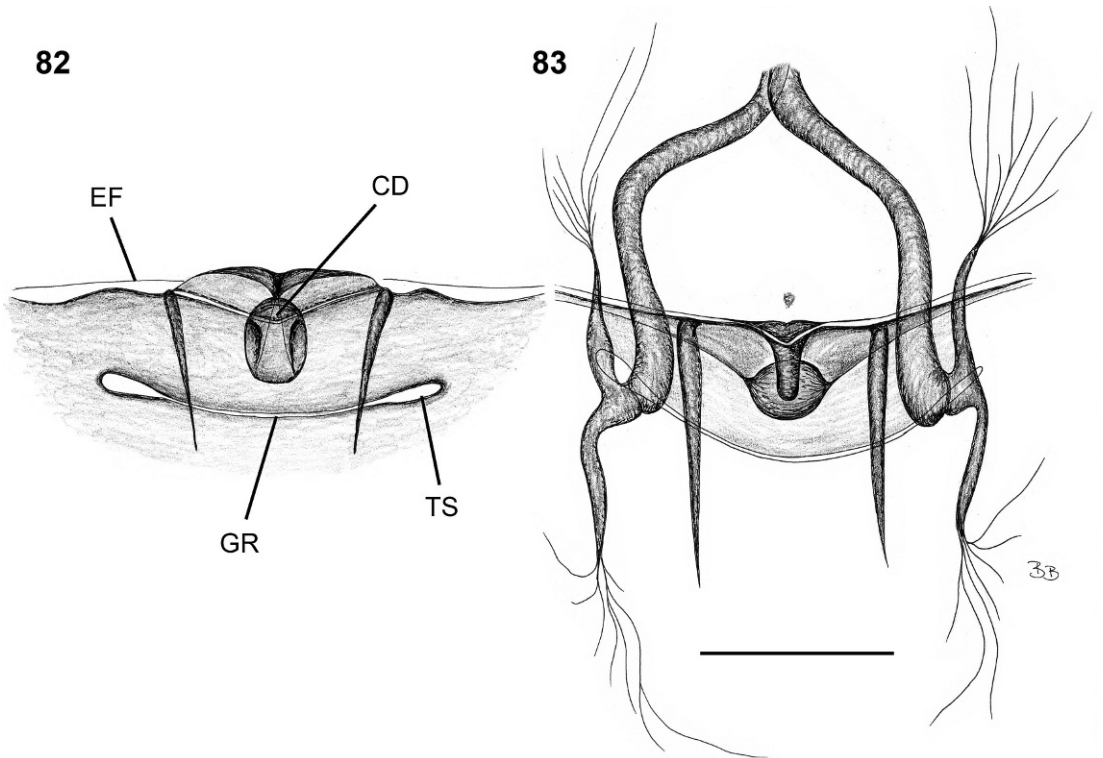
Figs. 71, 72. *Cavisternum clavatum*, new species, claws, lateral view. **71.** Female (PBI_OON 04903), leg I. **72.** Male (PBI_OON 04906), leg I. Scales: 10 μ m.



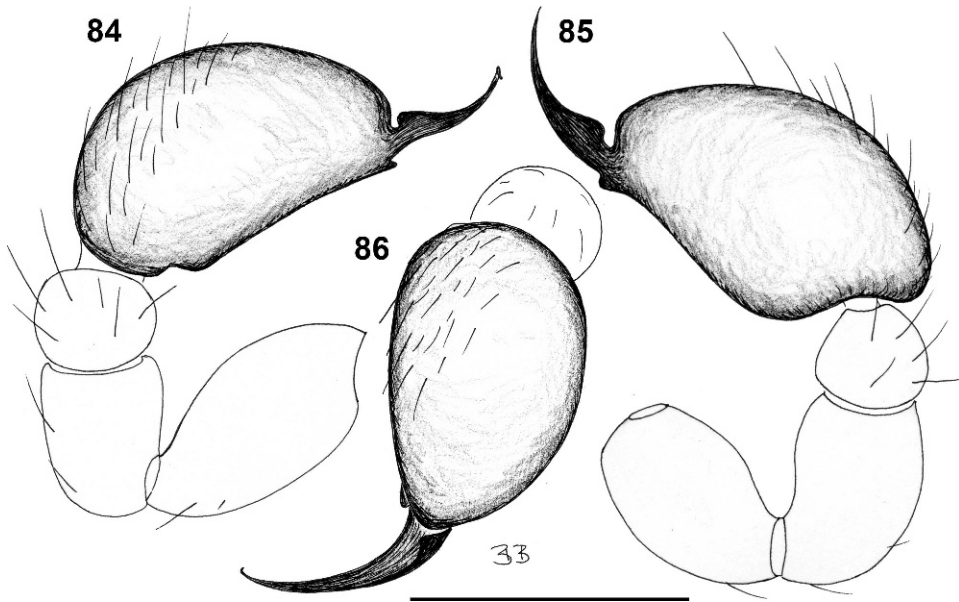
Figs. 73–76. *Cavisternum clavatum*, new species, spinnerets (PBI_OON 04903). **73.** Female, whole spinneret field. **74.** Female, right field, detail. **75.** Male, whole spinneret field. **76.** Male, right field, detail. ALS, anterior lateral spinneret; PLS, posterior lateral spinneret; PMS, posterior median spinnerets. Scales: 10 μm .



Figs. 77–81. *Cavisternum clavatum*, new species, male palp (PBI_OON 04906). 77. Prolateral view. 78. Dorsal view. 79. Retrolateral view. 80. Embolus, prolateral view. 81. Embolus, retrolateral view. Scales: 10 μ m.



Figs. 82, 83. *Cavisternum clavatum*, new species, female epigyne (PBI_OON 04906). 82. Ventral view. 83. Dorsal view, CD, copulatory duct; EF, epigastric fold; GR, groove between tracheal spiracles; TS, tracheal spiracles.



Figs. 84–86. *Cavisternum bagleyae*, new species, male palp (PBI_OON 06235). **84.** Prolateral view. **85.** Retrolateral view. **86.** Dorsal view.

tum not protruding. Cymbium-bulb complex ovoid with slim, medially bent embolus incised at base retro- and prolaterally (figs. 84–86).

FEMALE: Unknown.

DISTRIBUTION: This species is known only from the type locality in midwestern Queensland (map 6).

Cavisternum barthorum, new species

Figures 11, 87–89, map 2

TYPE: **AUSTRALIA: Queensland:** Male holotype from 23 km ESE of Cloncurry near Bishop Creek, 20°47'05"S, 140°42'49"E, 210 m (29 June–9 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006073), deposited in QM (S75110).

ETYMOLOGY: The specific name is a patronym in honor of Heidemarie Barth and her family.

DIAGNOSIS: Males of *C. barthorum* resemble those of *C. foxae*, with the sternal concavity occupying the whole sternal length (fig. 11) and the epigastric scutum not protruding. However, males of *C. barthorum* can be easily separated by the rounded anterior margin of the clavate field (fig. 11) and the ovoid cymbium-bulb

complex, with a smoothly, medially bent, corkscrew-shaped embolus (figs. 87–89).

MALE: Total length 1.08. Carapace 0.49 long, 0.37 wide; abdomen 0.59 long, 0.25 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, with oval field of clavate setae reaching anterior margin, covering about $\frac{4}{5}$ of sternum length and about $\frac{1}{2}$ of sternum width, anterior margin with rounded edges, with bare median band (fig. 11). Cheliceral fang elongated, fangs extremely long, thin, bent, and crossed (fig. 11). Abdomen ovoid, epigastric scutum not protruding. Cymbium-bulb complex ovoid with a broadly based and corkscrew-shaped embolus (figs. 87–89).

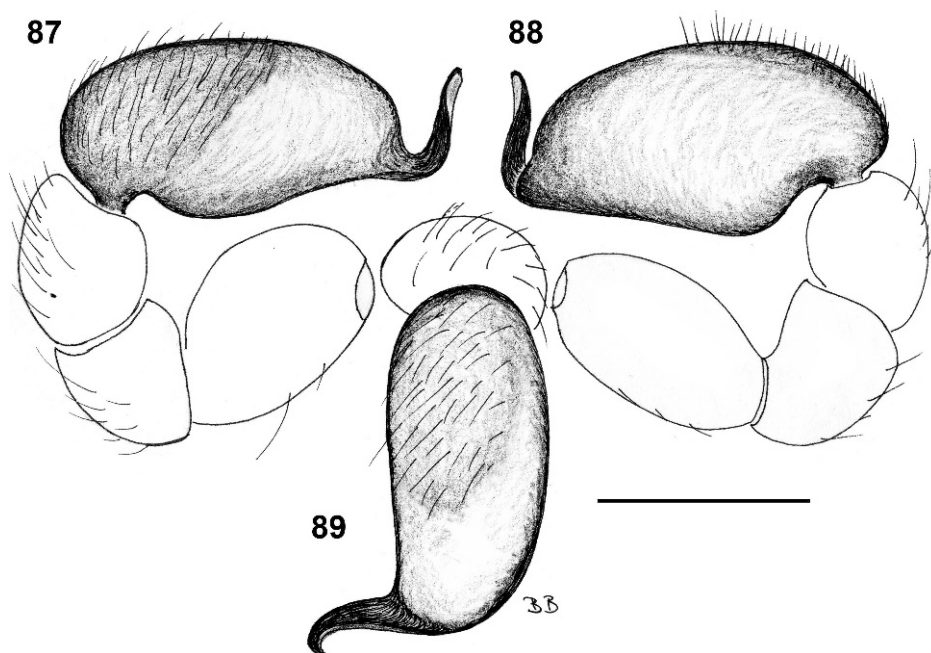
FEMALE: Unknown.

DISTRIBUTION: This species is found only at the type locality, in western Queensland (map 2).

Cavisternum bertmaini, new species

Figures 12, 90–94, map 1

TYPES: **AUSTRALIA: Western Australia:** Male holotype from Cape Bougainville, site 6/2 (FN7), 13°54'S, 126°05'E (10 June 1988,



Figs. 87–89. *Cavisternum barthorum*, new species, male palp (PBI_OON 06073). **87.** Prolateral view. **88.** Retrolateral view. **89.** Dorsal view.

A.R. Main) (PBI_OON 00005440), deposited in WAM T90/974. Female allotype, collected with holotype (PBI_OON 00005439), deposited in WAM (T90/976). Paratypes: 1 male, 2 females from same location (3 June 1988, A.N. Andersen) (PBI_OON00005441) deposited in WAM (T90/966–968).

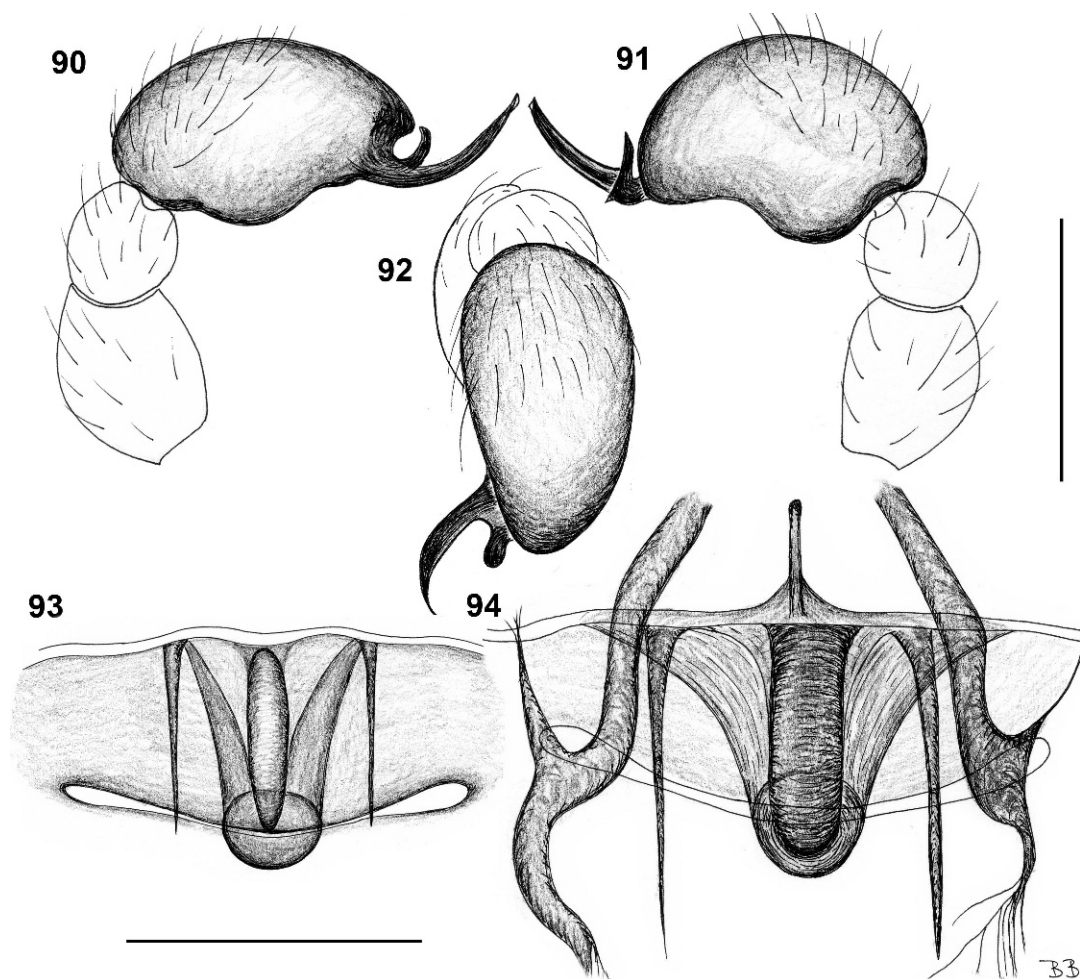
ETYMOLOGY: The specific name is a patronym in memory of Albert (Bert) R. Main, collector of the holotype, in recognition to his enormous contributions to ecology and taxonomy.

DIAGNOSIS: Males of *C. bertmaini* resemble those of *C. digweedi*, with the sternal concavity occupying about half the sternal length (fig. 12) and the epigastric scutum strongly protruding. Males of *C. bertmaini* can be easily separated, however, by their pear-shaped cymbium-bulb complex, and the thin, medially bent embolus with small club-shaped basal process (figs. 90–92). Females can be distinguished from all other *Cavisternum* species by their narrow copulatory duct, ending level with the tracheal groove (figs. 93, 94).

MALE: Total length 1.09. Carapace 0.52 long, 0.41 wide; abdomen 0.57 long, 0.35 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum as long as wide, concavity small in posterior median part of sternum, with drop-shaped field of clavate setae covering about $\frac{1}{3}$ of sternum width and $\frac{1}{2}$ of sternum length (fig. 12). Cheliceral fangs elongated, tips bent posteromedially forming V shape, tip widened distally (fig. 12). Abdomen ovoid, epigastric scutum strongly protruding. Cymbium-bulb complex pear shaped bearing a long, medially bent embolus with a small club-shaped basal process (figs. 90–92).

FEMALE: Total length 1.20. Carapace 0.50 long, 0.39 wide; abdomen 0.70 long, 0.31 wide. Coloration as in male. Epigastric area with dark, circular copulatory opening and narrow copulatory duct, ending at level of tracheal groove (figs. 93, 94).

DISTRIBUTION: This species is found at Cape Bougainville in the Kimberley region of Western Australia (map 1). *Cavisternum*



Figs. 90–94. *Cavisternum bertmaini*, new species. 90–92. Male palp (PBI_OON 05440). 90. Prolateral view. 91. Retrolateral view. 92. Dorsal view. 93, 94. Female epigyne (PBI_OON 05441). 93. Ventral view. 94. Dorsal view.

bertmaini was listed as *Oonopidae* sp. 02 by Main (1991).

Cavisternum carae, new species

Figures 13, 95–97, map 2

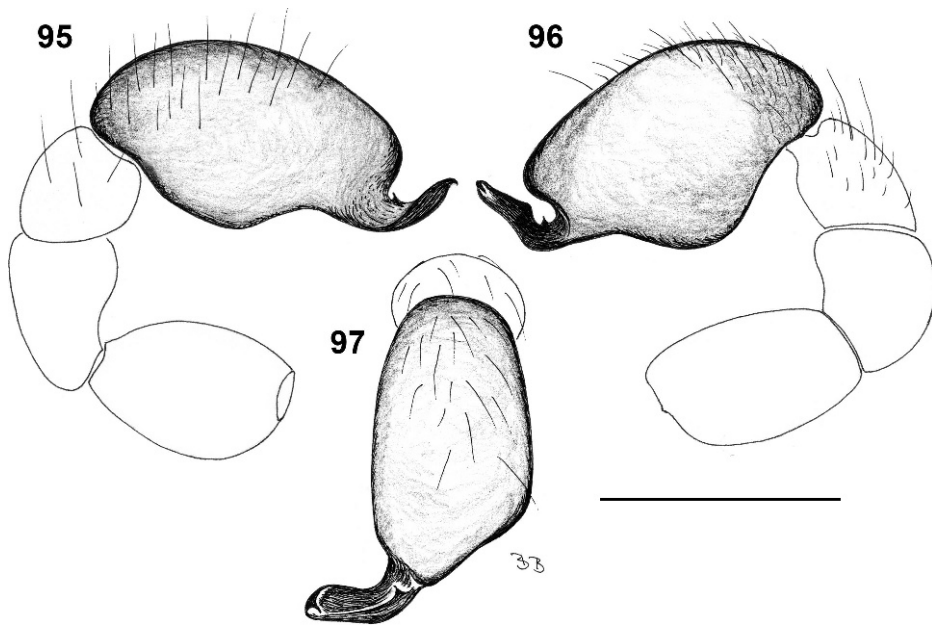
TYPE: AUSTRALIA: *Northern Territory*: Male holotype from Douglas Daly, 13°50'S, 131°11'E (Oct. 1997, T.B. Churchill; PBI_OON 00005434), deposited in WAM (T82256).

ETYMOLOGY: The specific name is a patronym in honor of Cara Churchill, the

daughter of Tracey Churchill who was the collector of the holotype and many other interesting oonopid spiders.

DIAGNOSIS: Males of *C. carae* resemble those of *C. bertmaini* with the sternal concavity occupying about half the sternal length (fig. 13) and the epigastric scutum strongly protruding. Males of *C. carae* can be separated by their broad, medially bent embolus with a tiny retrobasal spike (fig. 97).

MALE: Total length 1.10. Carapace 0.49 long, 0.37 wide; abdomen 0.61 long, 0.32 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum



Figs. 95–97. *Cavisternum carae*, new species, male palp (PBI_OON 05434). 95. Prolateral view. 96. Retrolateral view. 97. Dorsal view.

longer than wide, concavity small with drop-shaped field of clavate setae, covering about $\frac{1}{3}$ of sternum width and $\frac{1}{2}$ of sternum length at posterior median part of sternum (fig. 13). Cheliceral fangs elongated, tips bent posteromedially forming V shape, tip widened distally (fig. 13). Abdomen cylindrical, epigastric scutum strongly protruding. Cymbium-bulb complex square with a broad, medially bent embolus with a tiny retrobasal spike (figs. 95–97).

FEMALE: Unknown.

DISTRIBUTION: This species is recorded only from the type locality, in northwestern Northern Territory (map 2).

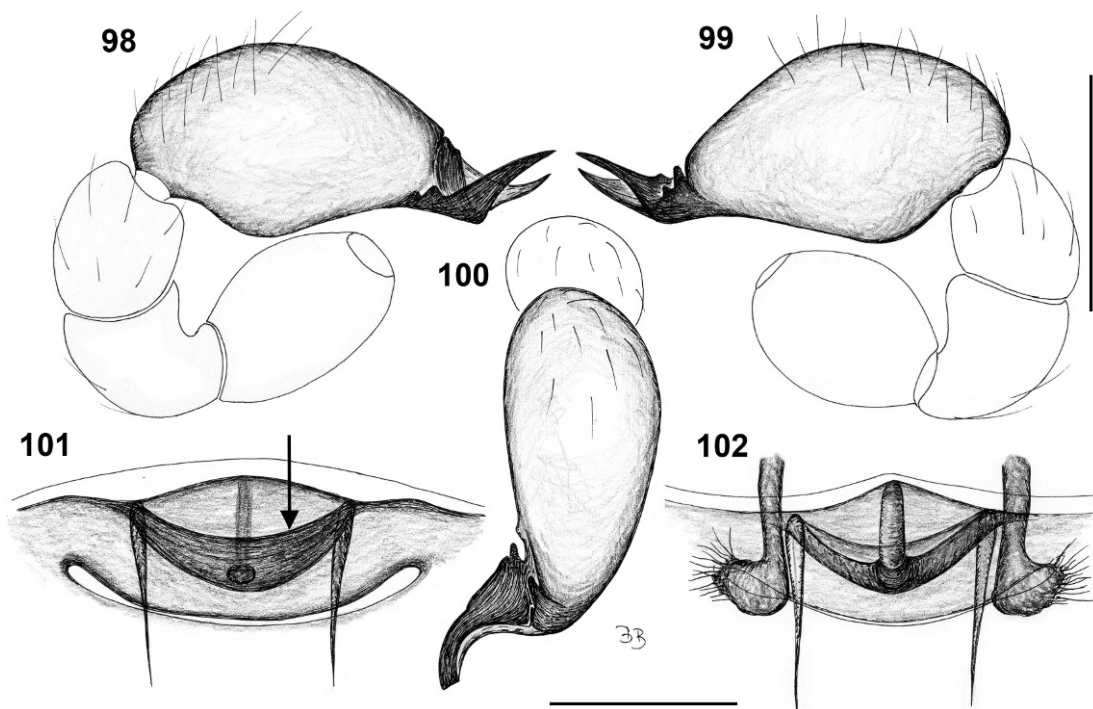
Cavisternum digweedi, new species

Figures 14, 98–102, map 1

TYPES: **AUSTRALIA: Northern Territory:** Male holotype from Kakadu National Park, Kapalga, site B2, 12°23'S, 132°18'E (5 Oct. 1986, A. Andersen et al.) (PBI_OON 00005438), deposited in WAM (T78180). Female allotype from Kakadu National Park, Kalpalga, site A1, 12°29'S, 132°19'E, woodland, pitfalls (15 Sep. 1986, A. Andersen)

(PBI_OON 00004609), deposited in WAM (T82247). Paratypes: 1 female from Kakadu National Park, Kapalga, site B2, 12°23'S, 132°18'E (26 Nov. 1986, A. Andersen) (PBI_OON 00003997), deposited in WAM (T82253); 1 female from Kakadu National Park, site B1, 12°23'S, 132°18'E, open forest, pitfalls (17 Dec. 1986, A. Andersen) (PBI_OON 00003995), deposited in WAM (T82252); 1 female from Kakadu National Park, site A2, 12°29'S, 132°19'E, woodland (30 June–2 July 1986, A. Andersen) (PBI_OON 00003992) deposited in WAM (T82250); 1 female from Kakadu National Park, Kalpalga, site A1, 12°29'S, 132°19'E, woodland, pitfalls (1 Oct. 1986, A. Andersen) (PBI_OON 00003991), deposited in WAM (T82249); 1 female from Kakadu National Park, site B1, 12°23'S, 132°18'E, open forest, pitfalls (7 Apr. 1987, A. Andersen) (PBI_OON 00003994) (WAM T82251); 2 males from Annaburroo, 12°50'S, 131°49'E (Oct. 1997, T.B. Churchill) (PBI_OON 00005432, PBI_OON 00005433), deposited in WAM (T82254, T82255).

ETYMOLOGY: The specific name is a patronym in honor of young Kai Digweed, born April 2009. Kai's arachnophobe father is



Figs. 98–102. *Cavisternum digweedi*, new species. **98–100.** Male palp (PBI_OON 05438). **98.** Prolateral view. **99.** Retrolateral view. **100.** Dorsal view. **101, 102.** Female epigyne (PBI_OON 04609). **101.** Ventral view; broad epigynal rim indicated. **102.** Dorsal view.

determined that his son should grow up to respect but not fear spiders.

DIAGNOSIS: Males of *C. digweedi* resemble those of *C. bertmaini*, with the sternal concavity occupying about half of the sternal length (fig. 14), and the epigastric scutum strongly protruding. Males of *C. digweedi* can be easily separated by their ovoid cymbium-bulb complex with a broadly based embolus and a twisted bifurcate tip (figs. 98–100). Females can be easily distinguished from all other *Cavisternum* species by the broad semicircular epigynal rim as wide as the apodemes, and the extremely narrow copulatory duct (figs. 101, 102).

MALE: Total length 1.07. Carapace 0.52 long, 0.37 wide; abdomen 0.55 long, 0.29 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum as long as wide, concavity small with drop-shaped field of clavate setae, covering about $\frac{1}{3}$ of sternum width and $\frac{1}{2}$ of sternum length, in posterior median part of sternum (fig. 14). Cheliceral fangs elongated, tips bent postero-

medially, positioned in V shape, tip distally widened. Abdomen ovoid, epigastric scutum strongly protruding. Cymbium-bulb complex ovoid with a broadly based embolus and a twisted bifurcate tip (figs. 98–100).

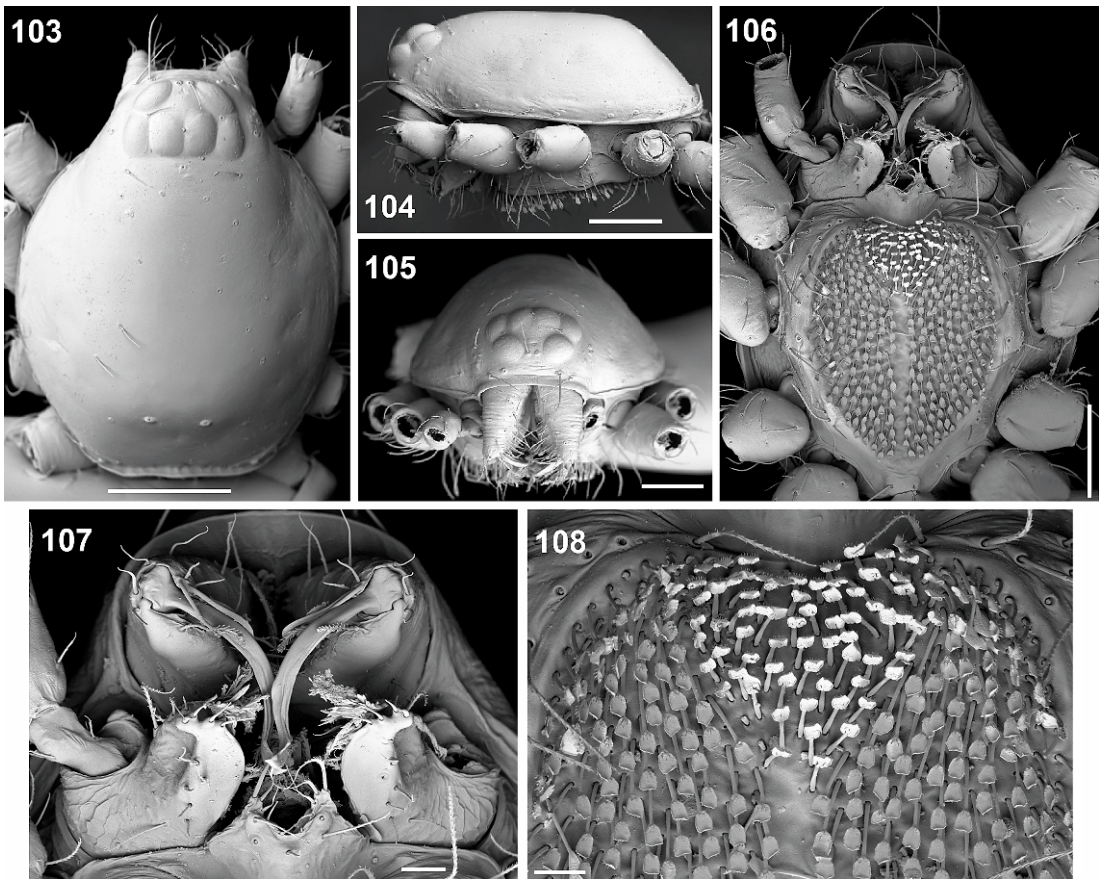
FEMALE: Total length 1.25. Carapace 0.49 long, 0.37 wide; abdomen 0.76 long, 0.31 wide. Coloration as in male. Epigastric area with dark semicircular rim, reaching apodemes laterally, with extremely narrow copulatory duct (figs. 101, 102).

DISTRIBUTION: This species is found in the north of the Northern Territory (map 1).

Cavisternum ewani, new species

Figures 2, 5, 8, 103–114, map 3

TYPES: **AUSTRALIA:** *Queensland:* Male holotype from Great Basalt Walls National Park, 19°14'33"S, 146°28'22"E, pitfall trap array, open forest, 420 m (27 Sept.–17 Dec. 2006, R. Raven, B. Baehr) (PBI_OON 00006013), deposited in QM (S81339). Female



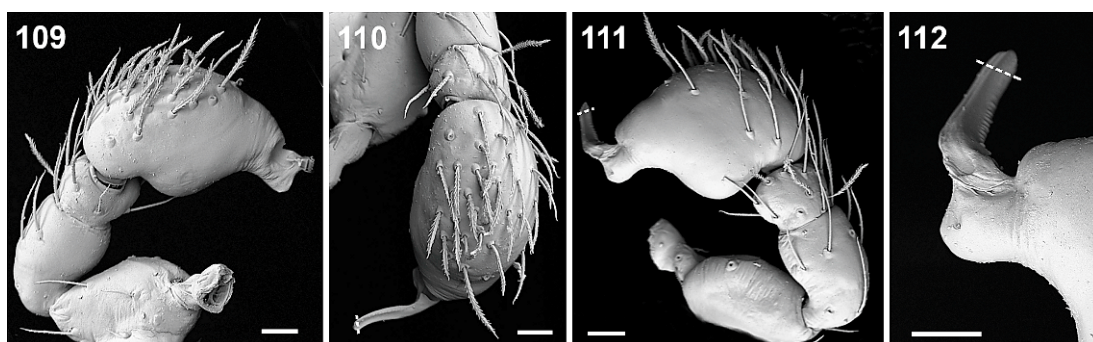
Figs. 103–108. *Cavisternum ewani*, new species, male (PBI_OON 23368). **103.** Carapace, dorsal view. **104.** Carapace, lateral view. **105.** Carapace frontal. **106.** Sternum, ventral view. **107.** Chelicerae, ventral view. **108.** Clavate setae. Scales: figs. 103–106, 100 μ m; figs. 107, 108, 20 μ m.

allotype from Rochford Scrub, 20°06'58"S, 146°35'38"E, pitfall (11 Dec. 2006–11 Feb. 2007, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006276), deposited in QM (S76771). Paratypes: 4 males from Lords Table, SE base, site 2, 22°40'30"S, 148°01'12"E, 13 Jan. 2006, C. Burwell, 1 male deposited in each of AM (PBI_OON 00023369, KS106292), AMNH (PBI_OON 00023370), WAM (PBI_OON 00023371, T95023), remainder in QM (PBI_OON 00021624, S73500).

ETYMOLOGY: The specific name is a patronym in honor of Ewan Jay Martyr McLean, the son of Stacey McLean, Senior Program Officer, Biodiversity Planning, Environment and Parks Branch, Brisbane City Council.

DIAGNOSIS: Males of *C. ewani* resemble those of *C. toadshow* with the sternal concavity occupying most of the sternal length, and the epigastric scutum not protruding (fig. 5). However, males of *C. ewani* can be easily separated from all other species by their broad field of clavate setae covering almost the whole width of the sternum (fig. 8). Females can be easily distinguished from all other *Cavisternum* species by their large elliptical membranous epigastric area (fig. 113).

MALE: Total length 1.07. Carapace 0.50 long, 0.39 wide; abdomen 0.57 long, 0.33 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, median concavity occupying most of sternal length, with U-shaped field of



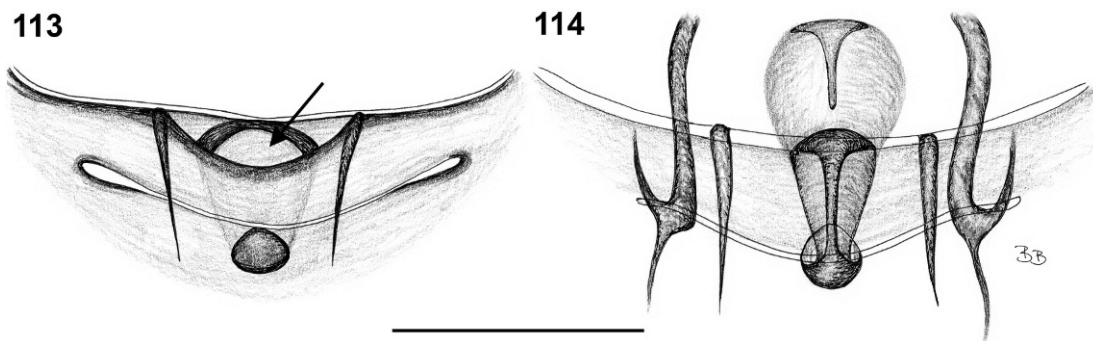
Figs. 109–112. *Cavisternum ewani*, new species, male palp (PBI_OON 23368). **109.** Prolateral view. **110.** Dorsal view. **111.** Retrolateral view. **112.** Embolus, retrolateral view. Scales: 20 μ m.

clavate setae, anterior margin of setae rectangular (fig. 8). Chelicerae slightly divergent, fangs, extremely long, slightly longer than paturon, directed posteriorly and crossed (figs. 106, 107). Abdomen ovoid. Epigastric scutum not protruding (fig. 5). Cymbium-bulb complex pear shaped, bearing a long, thin, medially bent embolus at its apex (figs. 109–112).

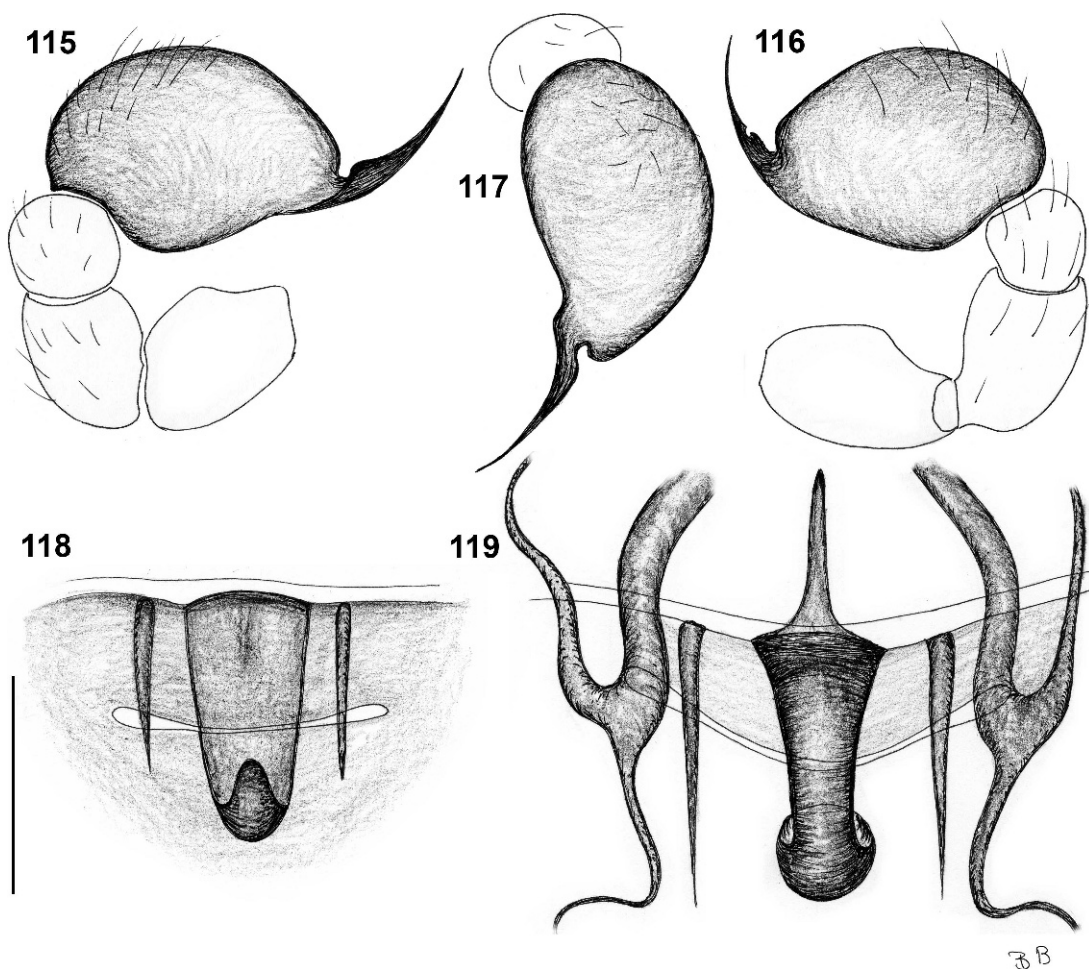
FEMALE: Total length 1.21. Carapace 0.46 long, 0.38 wide; abdomen 0.75 long, 0.32 wide. Coloration as in male. Epigastric fold with one large elliptical area, copulatory duct narrow in the middle and widened at both ends (figs. 113, 114).

OTHER MATERIAL EXAMINED: AUSTRALIA: Queensland: 16 km N of Warremba, 24°54'09"S, 148°35'36"E, 331 m, 27 June–6 Sep. 2006, R. Raven, B. Baehr, A. Amey, 1 ♂ (PBI_OON 00006214, QM S75256); 19 km NW of Wrotham Park Stn, Burketown Dvt Road, 16°31'43"S, 143°53'38"E, 188 m, 12 July–26

Sep. 2006, R. Raven, B. Baehr, A. Amey, 1 ♂ (PBI_OON 00006156, QM S75182). Dunbar E of Lynd River on Burketown Dvt Road, 16°21'48"S, 143°03'11"E, 91 m, 12 July–26 Sep. 2006, R. Raven, B. Baehr, A. Amey, 2 ♂ (PBI_OON 00006237, QM S75305). Killymoon Creek, S of Townsville, 19°24'S, 147°01'E, 27 July–2 Dec. 1992, R. Raven, P. Lawless, E. Lawless, M. Shaw, 1 ♂ (PBI_OON 00020956, QM S75577), 26 Oct. 1991–27 July 1992, 1 ♂, 1 ♀ (PBI_OON 00020998, QM S79583). Lake Broadwater via Dalby, 27°21'S, 151°06'E °E, 17 May–25 Nov. 1985, M. Bennie, 1 ♂ (PBI_OON 00020832, QM S79449). Lords Table, SE base, site 2, 22°40'30"S, 148°01'12"E, 13 Jan. 2006, C. Burwell, 1 ♂ (PBI_OON 00020038, QM S80257), 1 ♂ (PBI_OON 00020045, QM S73497). Red Falls, 19°55'47"S, 145°44'00"E, 360 m, 16 Dec. 2006, R. Raven, B. Baehr, A. Amey, 1 ♂ (PBI_OON 00006012, QM S81342). Roper Creek, via Coomburagee, site 3,



Figs. 113, 114. *Cavisternum ewani*, new species, female epigyne (PBI_OON 06072). **113.** Ventral view; elliptical membranous area indicated. **114.** Dorsal view.



Figs. 115–119. *Cavisternum foxae*, new species (PBI_OON 06069). 115–117. Male palp (PBI_OON 06069). 115. Prolateral view. 116. Retrolateral view. 117. Dorsal view. 118, 119. Female epigyne (PBI_23350). 118. Ventral view. 119. Dorsal view.

22°54'16"S, 148°20'00"E, 300 m, 11 Jan. 2006, C. Burwell, 1 ♂ (PBI_OON 00020031, QM S80091). SW along Alternate Savannah Way, SE of Chillagoe, 17°29'30"S, 144°36'53"E, 460 m, 13 July–27 Sep. 2006, R. Raven, B. Baehr, A. Amey, 1 ♂ (PBI_OON 00006072, QM S75099); same data but 2 ♂, 1 ♀ (PBI_OON 00023368, AM KS106290, one male used for SEM). Taroom district BS 24, 25°35'59"S, 149°46'11"E, June–11 Sep. 1996, P. Lawless, H. Janetzki, D. Cook, 1 ♂ (PBI_OON 00006976, QM S72962).

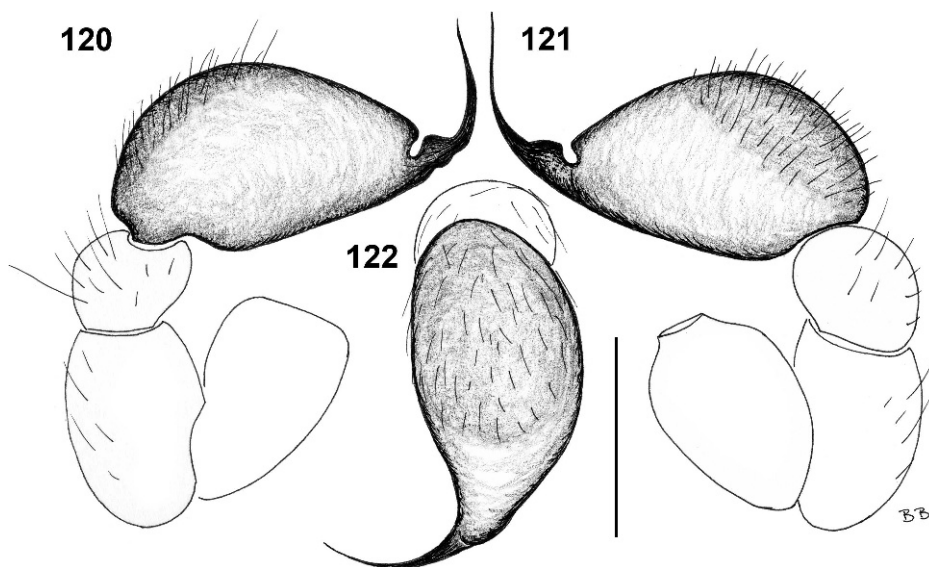
DISTRIBUTION: This species is widely distributed in drier areas of eastern Queensland (map 3).

Cavisternum foxae, new species

Figures 15, 115–119, map 4

TYPES: **AUSTRALIA:** *Queensland:* Male holotype from Bang Bang Jump-up, *Acacia* forest, 18°31'31"S, 140°39'38"E, 57 m, (10 July–23 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006069), deposited in QM (S75121). Female allotype collected with holotype (PBI_OON 00023350), deposited in QM (S83813).

ETYMOLOGY: This specific name is a patronym in honor of Lily Harriet Fox, a supporter of spider taxonomy.



Figs. 120–122. *Cavisternum gatangel*, new species, male palp (PBI_OON 06070). 120. Prolateral view. 121. Retrolateral view. 122. Dorsal view.

DIAGNOSIS: Males of *C. foxae* resemble those of *C. toadshow*, with the sternal concavity occupying the whole sternal length and half of the sternal width, and the epigastric scutum not protruding. However, males of *C. foxae* can be easily separated by the rectangular anterior margin of the patch of clavate setae, which reaches the anterior margin of the sternum, but with a bare median band (fig. 15), and by their ovoid cymbium-bulb complex with a broadly based and corkscrew-shaped embolus (figs. 115–117). Females can be easily distinguished from all other *Cavisternum* species by the long, narrow copulatory duct reaching beyond the tracheal groove (figs. 118, 119).

MALE: Total length 1.11. Carapace 0.49 long, 0.39 wide; abdomen 0.62 long, 0.30 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, with long field of clavate setae, covering about half of sternum width; anterior margin rectangular, posteriorly oval shaped, median band bare (fig. 15). Cheliceral fangs elongated, tips not widened distally. Abdomen cylindrical, epigastric scutum not protruding. Cymbium-bulb complex broadly ovoid with a thin, medially bent embolus incised at base (figs. 115–117).

FEMALE: Total length 1.14. Carapace 0.48 long, 0.36 wide; abdomen 0.66 long, 0.22 wide. Coloration as in male. Epigastric area (figs. 118, 119) with long narrow copulatory duct reaching beyond tracheal groove.

OTHER MATERIAL EXAMINED: AUSTRALIA: Queensland: Bang Bang Jump-up, *Acacia* forest, 18°31'31"S, 140°39'38"E, 57m, 10 July–23 Sep. 2006, R. Raven, B. Baehr, A. Amey, 12 ♂ (PBI_OON 00023349, QM S86479); Bang Bang Jump-up, rocky hillside, 18°31'25"S, 140°39'48"E, 38 m, 10 July–23 Sep. 2006, R. Raven, B. Baehr, A. Amey, 1 ♂ (PBI_OON 00006149, QM S75221); same data, 1 ♂ (PBI_OON 00020606, QM S77174); Warren Vale Station, Poverty Knob, 18°27'10"S, 140°40'16"E, 43 m, 3 July–24 Sep. 2006, R. Raven, B. Baehr, A. Amey, 2 ♂ (PBI_OON 00006238, QM S75306); same data (PBI_OON 00006089, QM S75124).

DISTRIBUTION: This species is found in northwestern Queensland (map 4).

Cavisternum gatangel, new species

Figures 16, 120–122, map 4

TYPE: AUSTRALIA: Queensland: Male holotype from 19 km NW of Winton by road,

22°16'11"S, 142°55'34"E, 212 m (29 June–7 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 000060700), deposited in QM (S75125).

ETYMOLOGY: This specific name is a patronym in honor of the German-Australian travel agency, the Worldwide Travel Angels.

DIAGNOSIS: Males of *C. gatangel* resemble those of *C. ewani*, with the median sternal concavity occupying nearly the whole sternal length (fig. 16). However, males of *C. gatangel* can be easily separated by their shorter cheliceral fangs, their widely triangular field of clavate setae, and the cone-shaped cymbium-bulb complex with a thin, medially bent embolus which is incised at base (figs. 120–122).

MALE: Total length 1.00. Carapace 0.47 long, 0.40 wide; abdomen 0.53 long, 0.35 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum as long as wide with broad, triangular field of clavate setae, covering most of sternum, bare median band half as long as covered field and equal in width (fig. 16). Cheliceral fangs not reaching labium, crossed, tips distally widened. Abdomen ovoid, epigastric scutum not protruding. Cymbium-bulb complex cone shaped with a thin, medially bent embolus incised at base (figs. 120–122).

FEMALE: Unknown.

DISTRIBUTION: This species is known only from the type locality in midwestern Queensland (map 4).

Cavisternum heywoodi, new species

Figures 17, 123–127, map 5

TYPES: **AUSTRALIA: Queensland:** Male holotype from Mt Molloy, 16°44'27"S, 145°19'19"E, riparian woodland, 400 m (Dec. 1992–Jan. 1993, S. Burnett) (PBI_OON 00007474), deposited in QM (S72984). Female allotype from same location (1 Jan. 1993, S. Burnett) (PBI_OON 00020933), deposited in QM (S59015).

ETYMOLOGY: The specific name is a patronym in loving memory of Hosea Heywood.

DIAGNOSIS: Males of *C. heywoodi* resemble those of *C. rochesteriae* with the sternal concavity occupying about ½ the sternal length and ⅔ of the sternal width (fig. 17),

and the epigastric scutum slightly protruding. Males of *C. heywoodi* have smaller eyes, and long and thick fangs, which that cross and reach labium (fig. 17), and a long flattened embolus with a deep basal incision (fig. 124). Females of *C. heywoodi* differ from other known females by the tripartite copulatory duct (figs. 126, 127).

MALE: Total length 1.17. Carapace 0.54 long, 0.46 wide; abdomen 0.63 long, 0.38 wide. Carapace, sternum, mouthparts, and abdominal scutae orange-brown, legs yellow. Sternum as long as wide, with median concavity occupying about ½ of sternal length, ⅔ of sternal width (fig. 17). Cheliceral paturon with large triangular distal tooth at basis of fang, fang long, tip distally widened, bent posteromedially and crossing other fang. Abdomen ovoid, epigastric scutum slightly protruding. Cymbium-bulb complex square, with a long flattened embolus deeply incised at retrolateral base (figs. 123–125).

FEMALE: Total length 1.21. Carapace 0.52 long, 0.41 wide; abdomen 0.69 long, 0.35 wide. Coloration as in male. Epigastric area with semicircular rim, reaching apodemes laterally, a large U-shaped field consisting of three parts reaching beyond tracheal groove and a narrow copulatory duct (figs. 126, 127).

OTHER MATERIAL EXAMINED: **AUSTRALIA: Queensland:** Davies Creek National Park, 17°00'S, 145°34'E, 29 Oct. 1991–23 July 1992, R. Raven, P. Lawless, M. Shaw, 2 ♂, 1 ♀ (PBI_OON 00006914, QM S22724), 1 ♀ (PBI_OON 00019982, QM S79595); 23 July–26 Nov. 1992, R. Raven, P. Lawless, M. Shaw, 2 ♂ (PBI_OON 00019949, QM S72979).

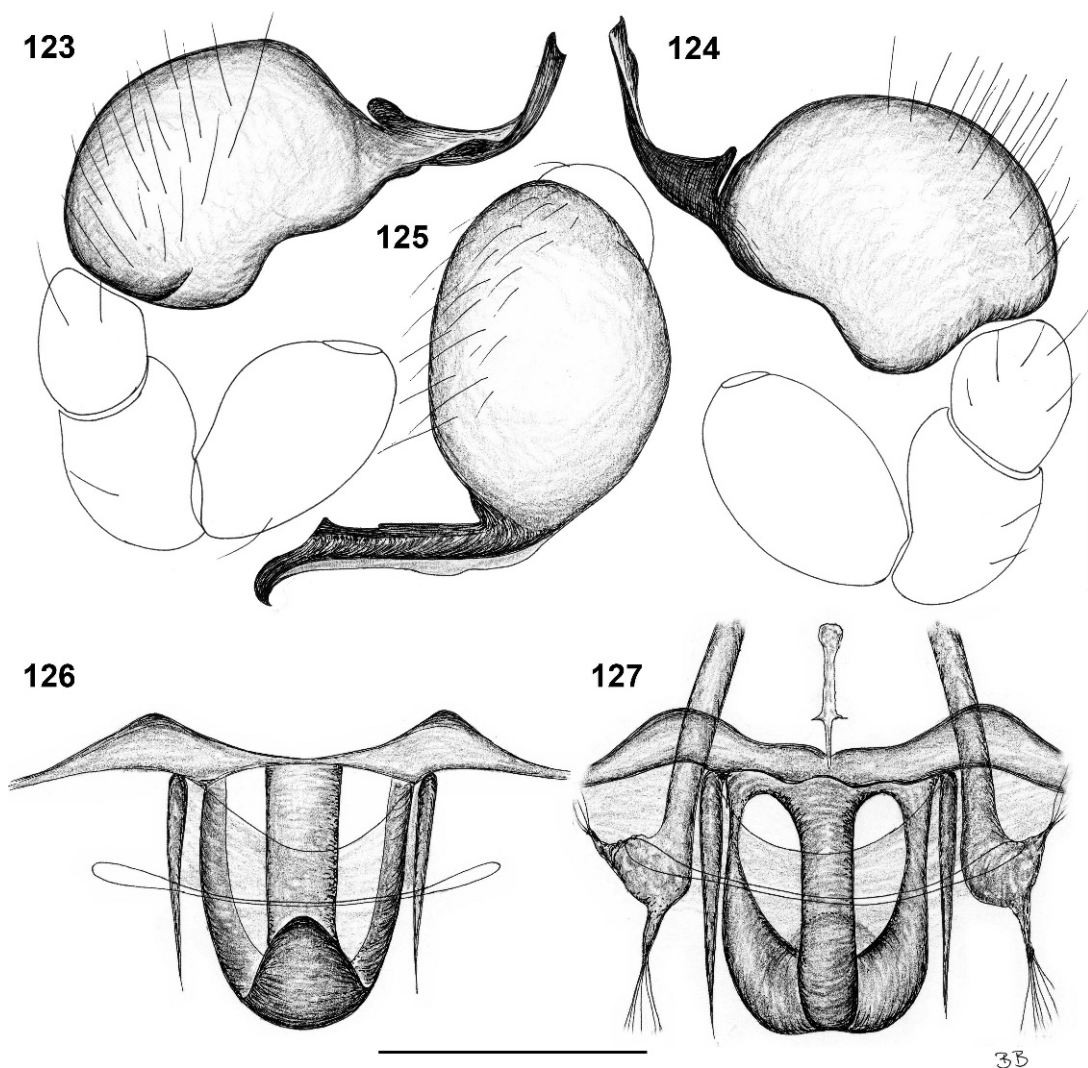
DISTRIBUTION: This species is found in northeastern Queensland (map 5).

Cavisternum hughesi, new species

Figures 18, 128–130, map 6

TYPE: **AUSTRALIA: Queensland:** Male holotype from 13 km E of Weipa, 12°40'S, 142°00'E, in flight intercept trap (24 Oct.–15 Nov. 1993, P. Zborowski, M. Horak) (PBI_OON 00022901), deposited in QM (S86409).

ETYMOLOGY: The specific name is a patronym in honor of Gerald (aka Gerry) Hughes. Gerald is a carefree spirit from

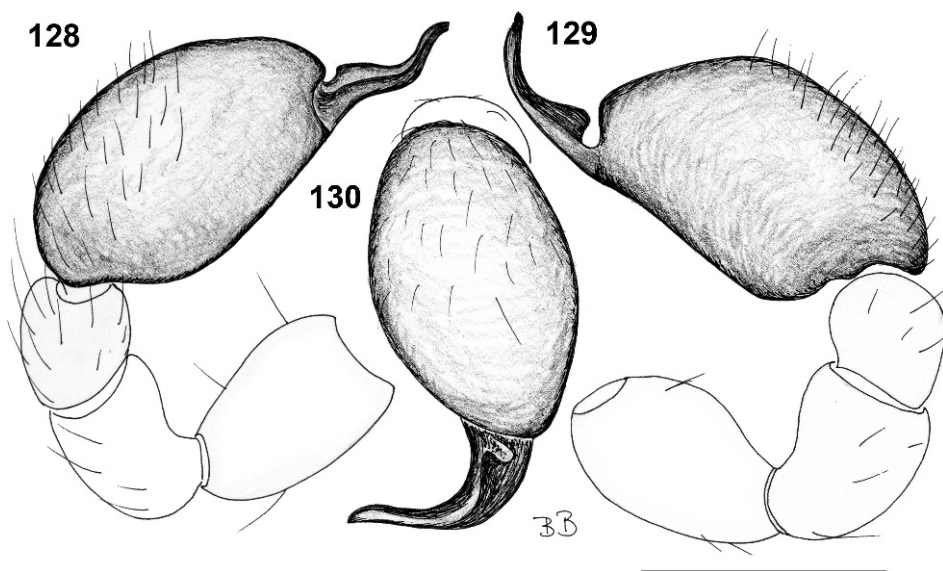


Figs. 123–127. *Cavisternum heywoodi*, new species. **123–125.** Male palp (PBI_OON 07474). **123.** Prolateral view. **124.** Retrolateral view. **125.** Dorsal view. **126, 127.** Female epigyne (PBI_OON 06914). **126.** Ventral view. **127.** Dorsal view.

Birkenhead, England with a zest for life and an irrational fear of spiders.

DIAGNOSIS: Males of *C. hughesi* resemble those of *C. gatangel* in the cone-shaped cymbial bulb (figs. 128–130) and the size of the sternal concavity (fig. 18). They can be easily separated by the much wider bare median band (fig. 18) and the slightly protruding epigastric scutum; in addition, the embolus is longitudinally grooved and broader than in *C. gatangel*.

MALE: Total length 0.98. Carapace 0.45 long, 0.34 wide; abdomen 0.53 long, 0.28 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum as long as wide, concavity occupying most of the sternum length, with broadly oval field of clavate setae, bare median band triangular, half length of concave area (fig. 18). Cheliceral fangs long but not reaching labium, with sharp tips, crossing. Abdomen cylindrical, epigastric scutum slightly protruding.



Figs. 128–130. *Cavisternum hughesi*, new species, male palp (PBI_22901). 128. Prolateral view. 129. Retrolateral view. 130. Dorsal view.

Cymbium-bulb complex cone shaped, embolus longitudinally grooved and broadened basally with U-shaped incision (fig. 128–130).

FEMALE: Unknown.

DISTRIBUTION: This species is known only from western Cape York Peninsula (map 6).

***Cavisternum ledereri*, new species**

Figures 19, 131–135, map 4

TYPES: **AUSTRALIA: Queensland:** Male holotype from Thatch Creek (NQ 32), 19°06'S, 145°18'E (26 July–1 Dec. 1992; R. Raven, P. Lawless, E. Lawless, M. Shaw) (PBI_OON 00020010), deposited in QM (S25275). Female allotype collected with holotype (PBI_OON 00023346), deposited in QM (S83815).

ETYMOLOGY: The specific name is a patronym in honor of Zachary Lederer, a supporter of spider taxonomy.

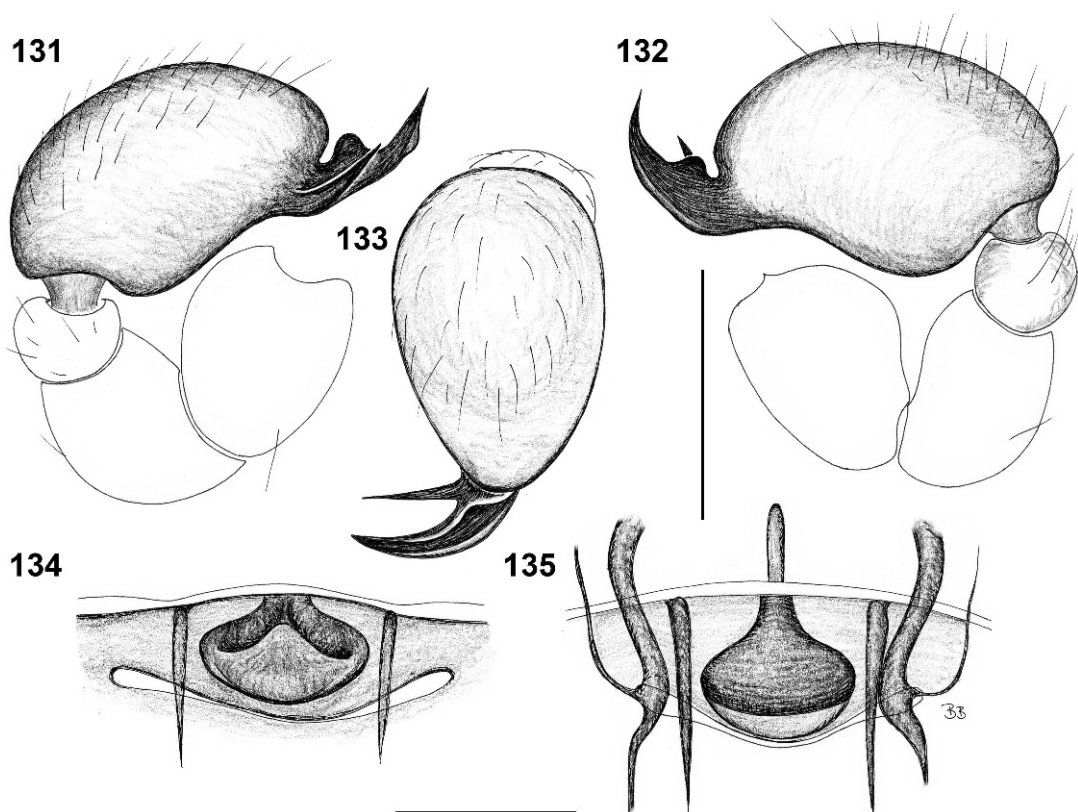
DIAGNOSIS: Males of *C. ledereri* resemble those of *C. foxae* as both have the sternal concavity occupying the whole sternal length (fig. 19) and the epigastric scutum is not protruding. However, males of *C. ledereri* can be easily separated from all other species by their pear-shaped cymbium-bulb complex with a bifurcate embolus (fig. 133). Females

can be easily distinguished from all other *Cavisternum* species by their dark, broadly oval epigastric area with inverted V-shaped copulatory opening situated between groove and epigastric fold, and with the copulatory duct short, broadly oval and narrowed toward the epigastric fold (figs. 134, 135).

MALE: Total length 1.11. Carapace 0.51 long, 0.40 wide; abdomen 0.60 long, 0.30 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, concavity, along the whole length of the sternum, U-shaped field of clavate setae covering about $\frac{3}{4}$ of sternum width (fig. 19). Cheliceral fangs extremely long, crossed, tips bent medially and distally widened. Abdomen cylindrical, epigastric scutum not protruding. Cymbium-bulb complex pear shaped with bifurcate embolus (figs. 131–133).

FEMALE: Total length 1.17. Carapace 0.50 long, 0.38 wide; abdomen 0.67 long, 0.30 wide. Coloration as in male. Epigastric area a broadly oval region with inverted V-shaped copulatory opening, situated between groove and epigastric fold, copulatory duct short, broadly oval, narrowed toward epigastric fold (figs. 134, 135).

OTHER MATERIAL EXAMINED: **AUSTRALIA: Queensland:** Thatch Creek (NQ 32), 19°06'S,



Figs. 131–135. *Cavisternum ledereri*, new species. 131–135. Male palp (PBI_20010). 131. Prolateral view. 132. Retrolateral view. 133. Dorsal view. 134, 135. Female epigyne (PBI_OON 07430). 134. Ventral view. 135. Dorsal view.

145°18'E (26 July–1 Dec. 1992, R. Raven, P. Lawless, E. Lawless, M. Shaw), 2 ♂ (PBI_OON 00023345) (QM S83814); same data except (1 Dec. 1992–14 Apr. 1993), 18 ♂, 1 ♀ (PBI_OON 00007430) (QM S59573); same data, 1 ♂ (PBI_OON 00020939, QM S52810).

DISTRIBUTION: This species is known only from the type locality in mideastern Queensland (map 4).

Cavisternum maxmoormanni, new species

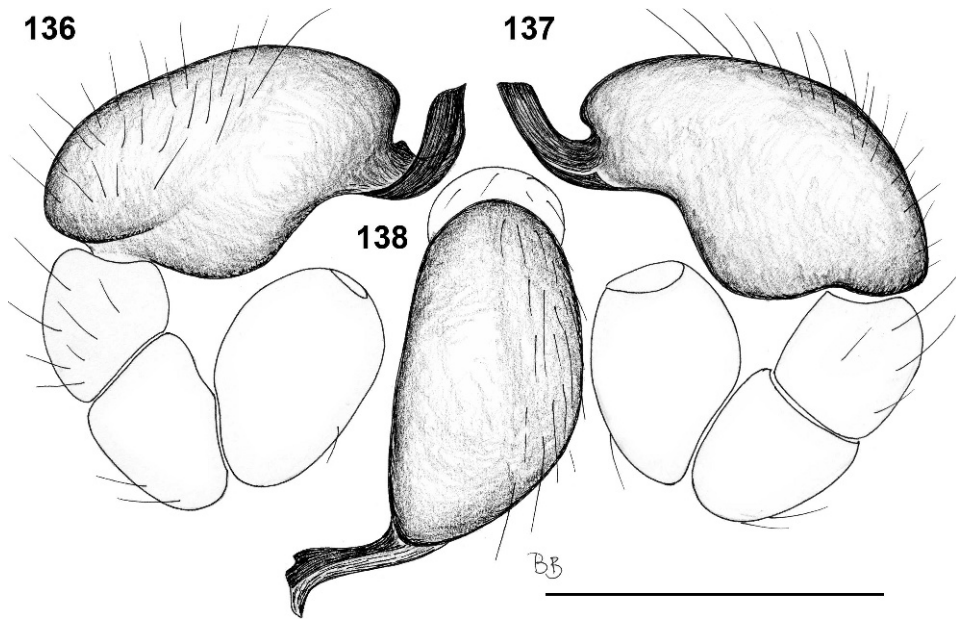
Figures 20, 136–138, map 5

TYPE: AUSTRALIA: Northern Territory: Male holotype from N of Walhallow, Tablelands Highway, 17°37'30"S, 135°41'19"E, 240 m (8 July–22 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006198), deposited in QM (S81165).

ETYMOLOGY: The specific name is a patronym in honor of Max Moormann, a young man who enjoys being on his hands and knees in the dirt discovering the secret life of the outback.

DIAGNOSIS: Males of *C. maxmoormanni* resemble those of *C. michaelbellomoi* as both have a very small sternal concavity (fig. 20). However, males of *C. maxmoormanni* have a strongly protruding epigastric scutum, relatively short posteromedially directed fangs just reaching the labium (fig. 20), and a flat, medially bent embolus with a slightly incised base (figs 136–138).

MALE: Total length 1.00. Carapace 0.48 long, 0.36 wide; abdomen 0.52 long, 0.30 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum as long as wide with very small median concavity (fig. 20). Cheliceral fangs relatively



Figs. 136–138. *Cavisternum maxmoormanni*, new species, male palp (PBI_OON 06198). **136.** Prolateral view. **137.** Retrolateral view. **138.** Dorsal view.

short, not reaching labium, posteromedially directed forming V shape, tips not widened. Abdomen ovoid, epigastric scutum strongly protruding. Cymbium-bulb complex square with flattened embolus only slightly incised at base (figs. 136–138).

FEMALE: Unknown.

DISTRIBUTION: This species has been found only at the type locality in northeastern Northern Territory (map 5).

Cavisternum mayorum, new species

Figures 21, 139–143, map 6

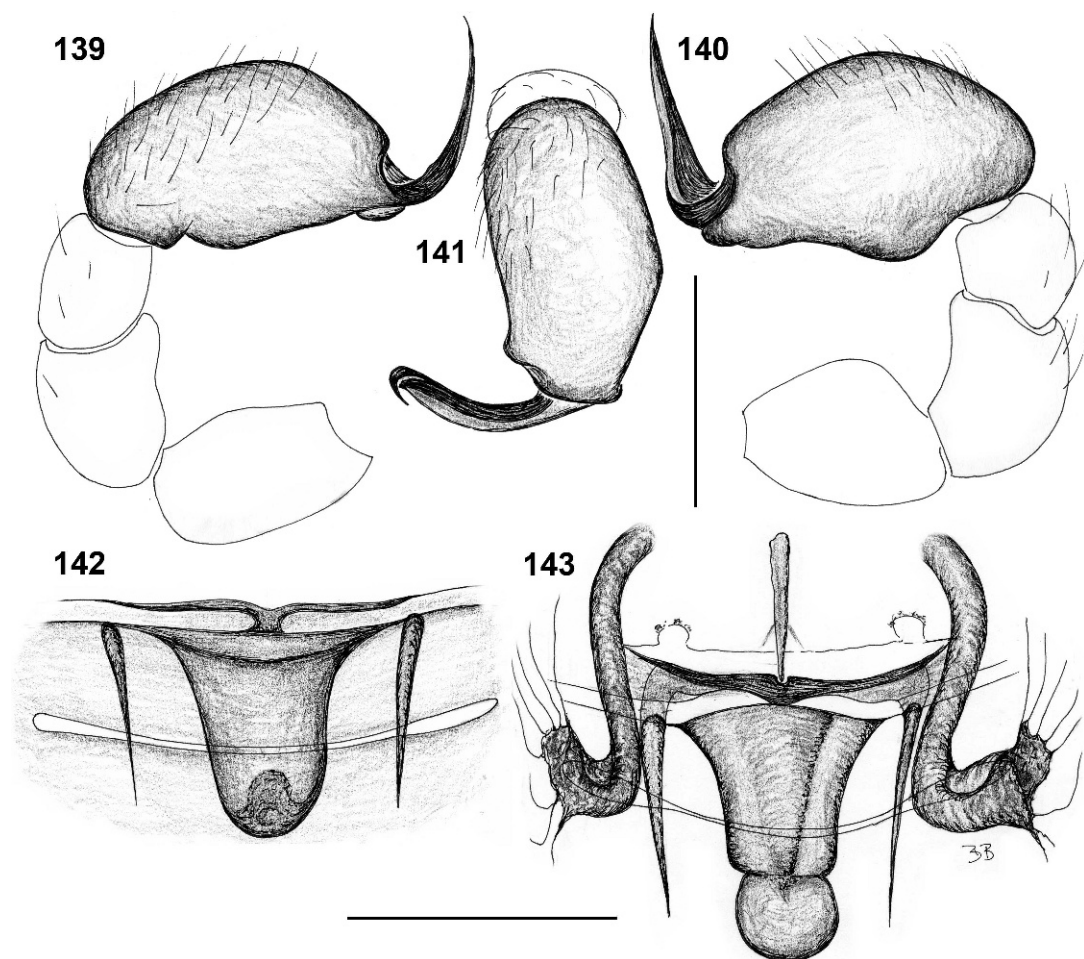
YPES: **AUSTRALIA: Queensland:** Male holotype from 4 km NE of Undilla on Gregory Downs–Camooweal Road (NQ 32), 19°36'11"S, 138°44'49"E, 255 m (30 June–23 Sep. 2006; R. Raven, B. Baehr, A. Amey) (PBI_OON 00006167), deposited in QM (S75210). Female allotype collected with holotype (PBI_OON 00023347), deposited in QM (S20634).

ETYMOLOGY: The specific name is a patronym in honor of Caitlyn and Taylah May. Both girls possess a great love of all animals,

most likely inherited from their great-great-grandfather, Charles Barrett—a naturalist and author during the first half of the 20th century.

DIAGNOSIS: Males of *C. mayorum* resemble those of *C. barthorum* in having a long field of clavate setae with the sternal concavity covering about half of the sternum width (fig. 21). Males of *C. mayorum* can be easily separated by the oval field not reaching the anterior sternal margin, the extremely long and undulate male fangs (fig. 21), the strongly protruding epigastric scutum, and the square cymbium-bulb complex with an extremely long, smoothly inward-bent embolus (figs. 139–141). Females can be easily distinguished by their long, broad copulatory duct, which reaches beyond the tracheal groove (figs. 142, 143).

MALE: Total length 1.14. Carapace 0.52 long, 0.42 wide; abdomen 0.62 long, 0.37 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, with oval field of clavate setae not reaching anterior margin, covering about $\frac{3}{4}$ of sternum length and about $\frac{1}{2}$ of sternum width (fig. 21). Cheliceral fangs ex-



Figs. 139–143. *Cavisternum mayorum*, new species. **139–141.** Male palp (PBI_OON 06167). **139.** Prolateral view. **140.** Retrolateral view. **141.** Dorsal view. **142, 143.** Female epigyne (PBI_OON 06167). **142.** Ventral view. **143.** Dorsal view.

tremely long, thin undulate, crossed. Abdomen ovoid, epigastric scutum strongly protruding. Cymbium-bulb complex square with extremely long, smoothly inward-bent embolus (figs. 139–141).

FEMALE: Total length 1.16. Carapace 0.51 long, 0.39 wide; abdomen 0.65 long, 0.25 wide. Coloration as in male. Epigastric area dark, with long, relatively broad copulatory duct reaching beyond tracheal groove (figs. 142, 143).

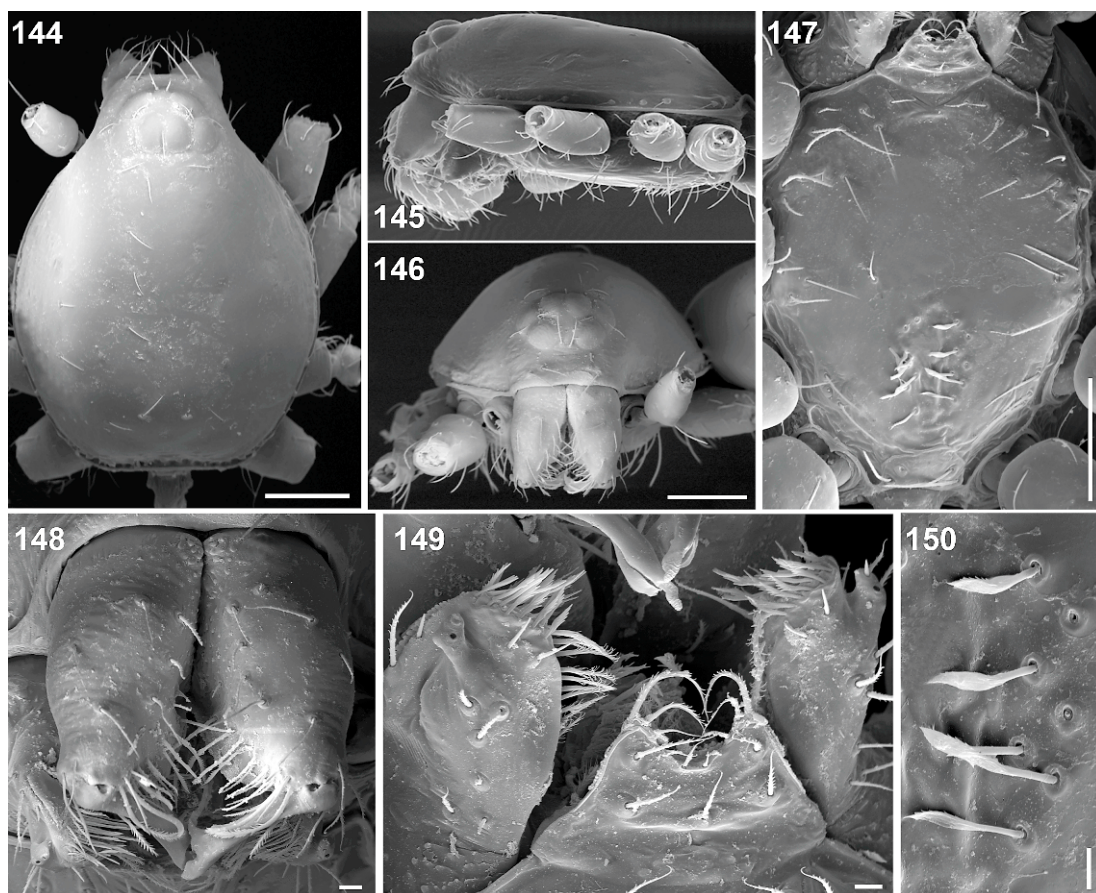
DISTRIBUTION: This species is known only from the type locality in northwestern Queensland (map 6).

Cavisternum michaelbellomoi, new species

Figures 3, 6, 9, 144–157; map 2

TYPES: **AUSTRALIA: Queensland:** Male holotype from Dalrymple National Park (site 2), 19°49'42"S, 146°05'26"E, 275 m (13 Dec. 2006–12 Feb. 2007, G. Monteith, D. Cook) (PBI_OON 00023352), deposited in QM (S81352). Female allotype collected with holotype (PBI_OON 00023351), deposited in QM (S83816).

ETYMOLOGY: The specific name is a patronym in honor of Michael Bellomo a bestselling author of books on science and



Figs. 144–150. *Cavisternum michaelbellomoi*, new species, male (PBI_OON 23367). **144.** Carapace, dorsal view. **145.** Carapace, lateral view. **146.** Carapace, frontal view. **147.** Sternum, ventral view. **148.** Chelicerae, dorsoventral view. **149.** Endites and labium. **150.** Detail of clavate setae on sternum. Scales: figs. 144–147, 100 μ m; figs. 148–150, 10 μ m.

technology. He is based in Los Angeles, California, and is extremely nervous around any arachnid larger than 1 mm.

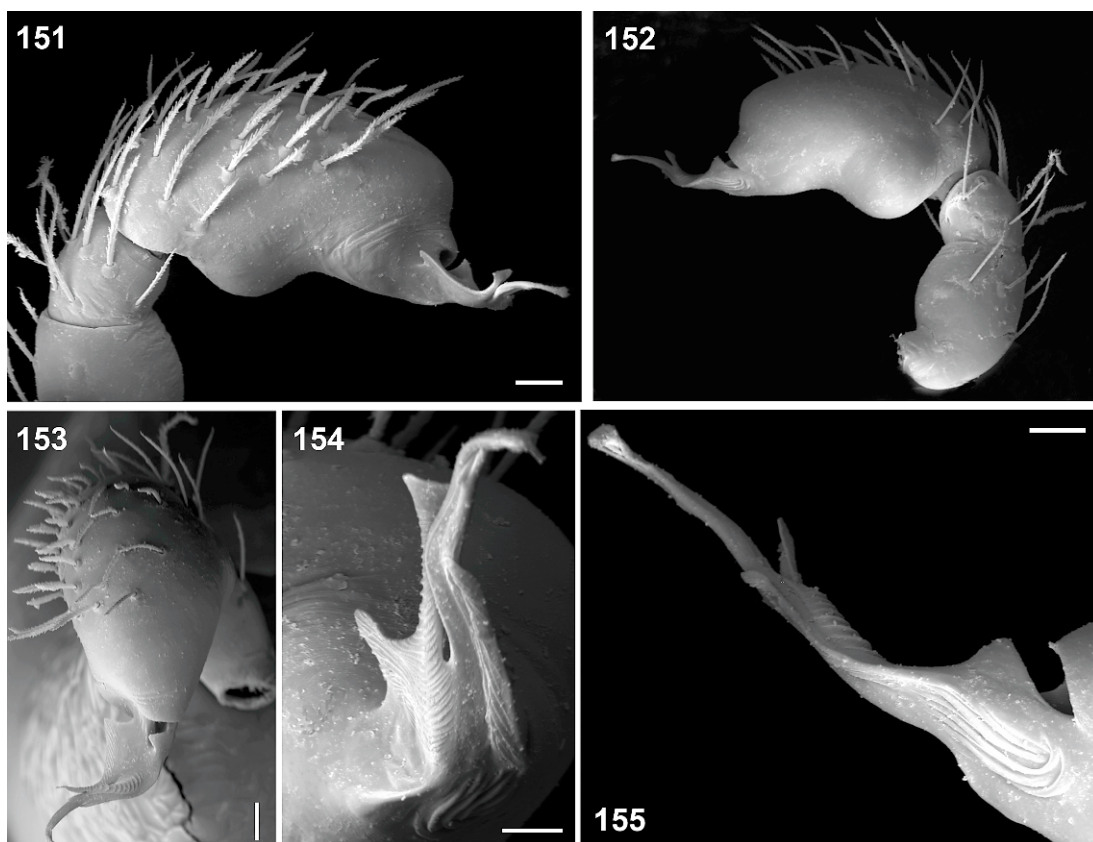
DIAGNOSIS: Males of *C. michaelbellomoi* resemble those of *C. maxmoormanni*, as both have a small patch of sternal clavate setae within a shallow sternal concavity (fig. 9). They differ in having the epigastric area only slightly protruding (fig. 6), and the triangular embolus with a long thin tip (figs. 151–155). Females can be easily separated by the relatively large triangular dark area within the epigastric area (figs. 156, 157).

MALE: Total length 1.25. Carapace 0.53 long, 0.39 wide; abdomen 0.72 long, 0.31 wide. Carapace, sternum, mouthparts, and abdom-

inal scutae yellow-brown, legs yellow. Sternum longer than wide, median concavity present as a small pit in posterior half of sternum (fig. 9). Chelicerae slightly divergent, fang distally widened (about $\frac{2}{3}$ of paturon length). Abdomen cylindrical, epigastric scutum slightly protruding. Cymbium-bulb complex ovoid, embolus triangular with long thin tip, sides of embolus striated (figs. 151–155).

FEMALE: Total length 1.26. Carapace 0.53 long, 0.40 wide; abdomen 0.73 long, 0.32 wide. Coloration as in male. Epigastric area with wide triangular dark region, copulatory duct broadly triangular and dorsally bent (figs. 156, 157).

OTHER MATERIAL EXAMINED: **AUSTRALIA:** *Queensland:* Dalrymple National Park, vine



Figs. 151–155. *Cavisternum michaelbellomoi*, new species, male palp (PBI_OON 23367). **151.** Prolateral view. **152.** Retrolateral view. **153.** Dorsal view. **154.** Embolus, ventral view. **155.** Embolus, retrolateral view. Scales: figs. 151–153, 20 μ m; figs. 154, 155, 10 μ m.

scrub on basalt, 19°49'41"S, 146°05'02"E, 275 m, 13 Nov. 2006, R. Raven, 1 ♀ (PBI_OON 00006347, QM S75340); Dalrymple National Park (site 2), 19°49'42"S, 146°05'26"E, 275 m, 13 Dec. 2006–12 Feb. 2007, G. Monteith, D. Cook, 2 ♂, 3 ♀ (PBI_OON 00006003) (QM S83817); same data, 2 ♂ (PBI_OON 00006287) (QM S75322); Red Falls, 19°55'47"S, 145°44'00"E S, 360 m, 16 Dec. 2006, B. Baehr, 2 ♂, 1 ♀ (PBI_OON 00006275) (QM S78001); same data except 3 ♂ (PBI_OON 00023367, AM KS106289, one used for SEM); Toomba Homestead site, 19°58'04"S, 145°34'49"E, 395 m, 17 Dec. 2006–13 Feb. 2007, R. Raven, A. Amey, 1 ♂ (PBI_OON 00006295) (QM S76833); same data except 13 Feb. 2007, R. Raven, 1 ♂ (PBI_OON 00006360) (QM S79369); same data except 2 ♂ (PBI_OON 00006453, QM S75375).

DISTRIBUTION: This species occurs in mid-eastern Queensland (map 2).

Cavisternum noelasherperdae, new species

Figures 22, 158–160, map 3

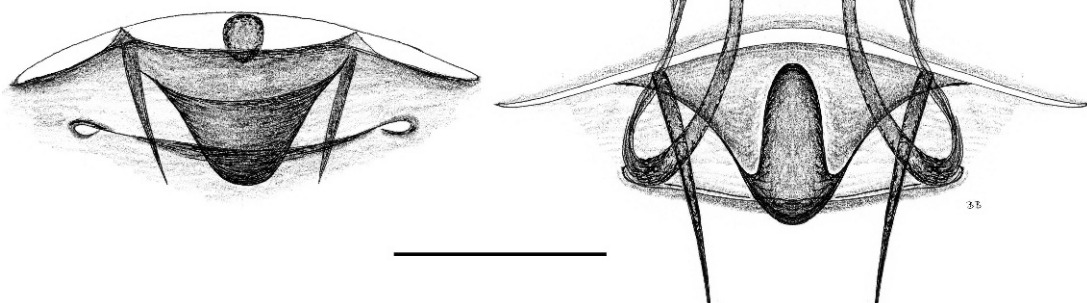
TYPE: AUSTRALIA: Northern Territory: Male holotype from Calvert Hills Station, 49 km W of Calvert Road turnoff, 16°49'23"S, 137°08'57"E, 150 m (6 July–14 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006104), deposited in QM (S75164).

ETYMOLOGY: The specific name is a patronym in honor of Noela Helene Shepherd.

DIAGNOSIS: Males of *C. noelasherperdae* resemble those of *C. ewani*, with the sternal concavity occupying most of the sternal length (fig. 22). However, males of *C. noelasherperdae*

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157



Figs. 156, 157. *Cavisternum michaelbellomoi*, new species, female epigyne (PBI_OON 06287). **156.** Ventral view. **157.** Dorsal view.

can be easily separated from all other species by their greatly reduced fangs (fig. 22), the endites with medially directed triangular lobes (fig. 22) and the row of stiff setae near the anterior margin of the clavate field (fig. 22).

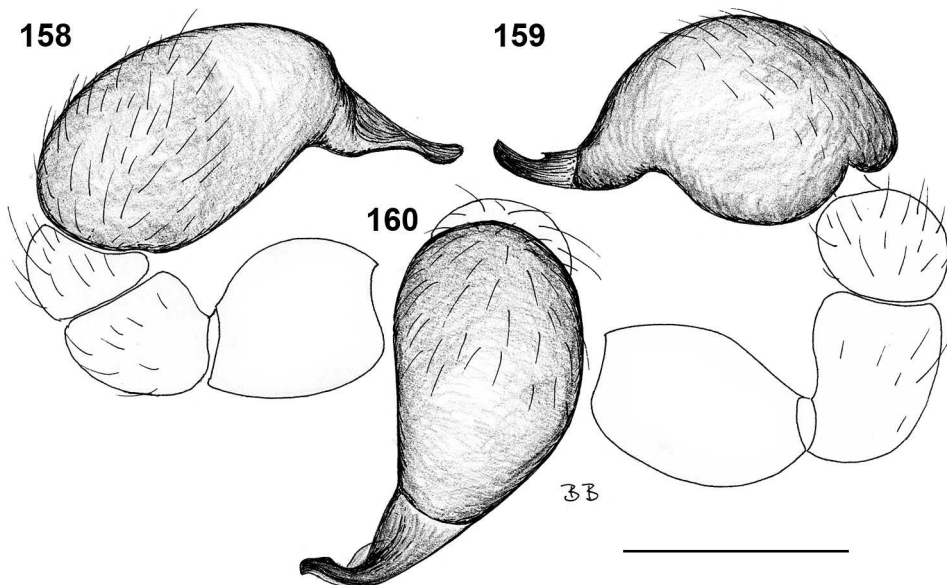
MALE: Total length 0.99. Carapace 0.49 long, 0.37 wide; abdomen 0.50 long, 0.29 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, median concavity occupying

most of sternal length, with field of clavate setae covering about half of sternum width, median band bare, anterior margin with rectangular rim of short, stiff setae (fig. 22). Chelicerae straight, fang directed medially, reduced, tip unmodified. Endites with medially directed triangular lobes. Abdomen ovoid, epigastric scutum slightly protruding; sperm pore surrounded by circular field of pores. Cymbium-bulb complex bearing a long, me-

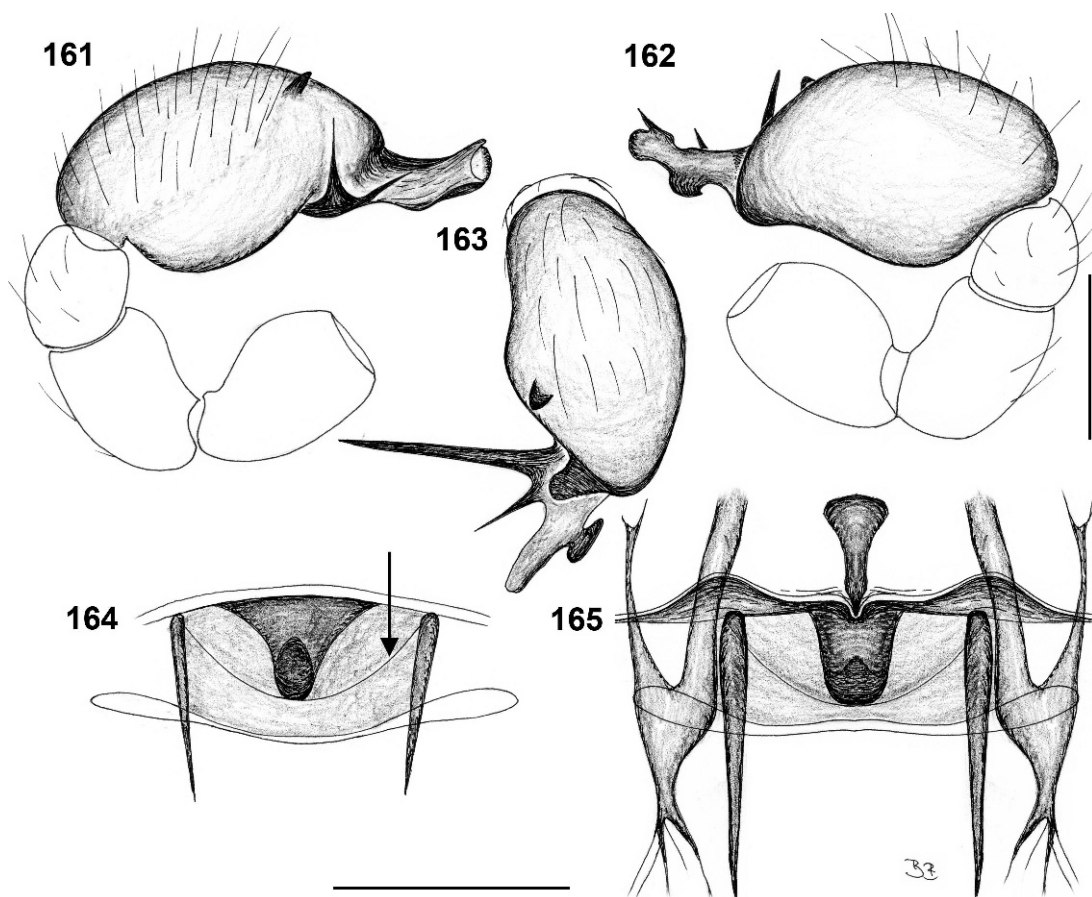
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Figs. 158–160. *Cavisternum noelasherperdae*, new species, male palp (PBI_OON 06104). **158.** Prolateral view. **159.** Retrolateral view. **160.** Dorsal view.



Figs. 161–165. *Cavisternum rochesteriae*, new species. 161–163. Male palp (PBI_OON 07072). 161. Prolateral view. 162. Retrolateral view. 163. Dorsal view. 164, 165. Female epigyne (PBI_OON 07072). 164. Ventral view; semicircular rim indicated. 165. Dorsal view.

dially bent embolus with a broadened basis (figs. 158–160).

FEMALE: Unknown.

DISTRIBUTION: This species is known only from Calvert Hills Station in northeastern Northern Territory (map 3).

Cavisternum rochesteriae, new species

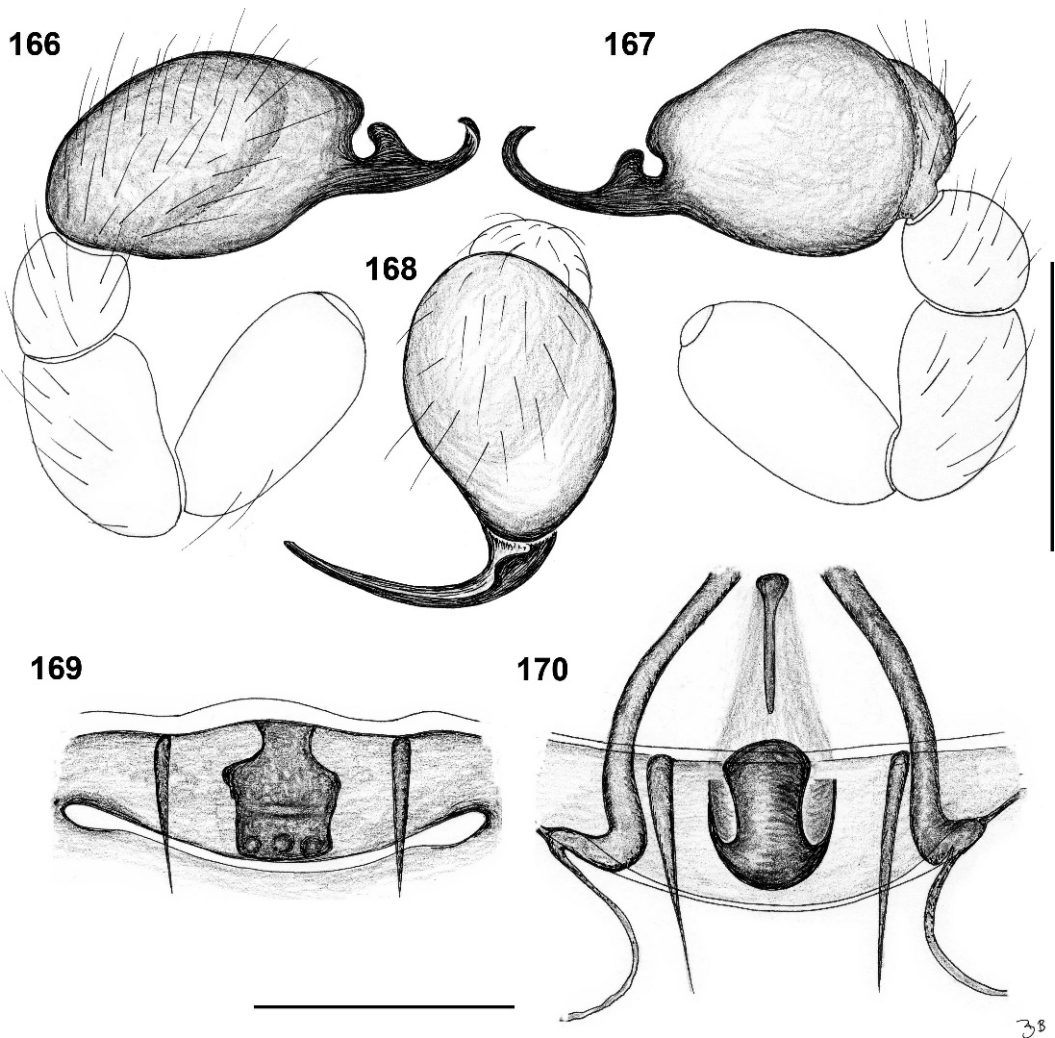
Figures 23, 161–165, map 5

TYPES: AUSTRALIA: *Queensland*: Male holotype from Mazeppa National Park, S end, 22°16'19"S, 147°16'00"E, 240 m (18 Dec. 2000, G. Monteith) (PBI_OON 00007072), deposited in QM (S78721). Female allotype collected with holotype (PBI_OON 00023348), deposited in QM (S86477).

ETYMOLOGY: The specific name is a patronym in honor of Renee Rochester, a supporter of spider taxonomy.

DIAGNOSIS: Males of *C. rochesteriae* resemble those of *C. heywoodi*, with the sternal concavity occupying about $\frac{1}{2}$ of the sternal length and $\frac{2}{3}$ of the sternal width (fig. 23), and the epigastric scutum slightly protruding. Males of *C. rochesteriae* have larger eyes, short medially directed fangs not reaching the labium (fig. 23), and a long tripartite embolus (figs. 161–163). Females can be easily distinguished by the epigynal semicircular rim and a dark triangular region, with the copulatory duct short, not reaching the tracheal groove (figs. 164, 165).

MALE: Total length 1.17. Carapace 0.52 long, 0.42 wide; abdomen 0.65 long, 0.38 wide.



Figs. 166–170. *Cavisternum toadshow*, new species. 166–168. Male palp (PBI_OON 06053). 166. Prolateral view. 167. Retrolateral view. 168. Dorsal view. 169, 170. Female epigyne (PBI_OON 06053). 169. Ventral view. 170. Dorsal view.

Carapace, sternum, mouthparts, and abdominal scutae orange-brown, legs yellow. Sternum as long as wide with median concavity occupying about $\frac{1}{2}$ of sternal length and $\frac{2}{3}$ of sternal width (fig. 23). Cheliceral fangs short, medially directed, not reaching labium, tip not widened; endite with additional toothlike projection dorsally. Abdomen ovoid, epigastric scutum slightly protruding. Cymbium-bulb complex square with additional cymbial prodistal tooth, embolus with three prongs, prolateral one acute and longest, median one half as long, retro-

lateral one about $\frac{2}{3}$ as long as prolateral prong (figs. 161–163).

FEMALE: Total length 1.33. Carapace 0.52 long, 0.42 wide; abdomen 0.81 long, 0.37 wide. Coloration as in male. Epigastric area with semicircular rim, reaching apodemes laterally, and a dark triangular region, copulatory duct short, not reaching tracheal groove (figs. 164, 165).

DISTRIBUTION: This species is known only from Mazeppa National Park in mideastern Queensland (map 5).

Cavisternum toadshow, new species

Figures 24, 166–170, map 3

Types: **AUSTRALIA: Queensland:** Male holotype from W of Normanton on Burketown–Normanton Road, 17°50'19"S, 140°51'34"E, 23 m (5 July–12 Sep. 2006, R. Raven, B. Baehr, A. Amey) (PBI_OON 00006053), deposited in QM (S75094). Female allotype collected with holotype (PBI_OON 00023344), deposited in QM (S86478).

Etymology: The specific name is a patronym in honor of Toadshow Ltd, a multimedia, web design, and print services company based in Brisbane, Queensland, and a supporter of spider taxonomy.

Diagnosis: Males of *C. toadshow* resemble *C. foxae* in having a long sternal concavity, but the patch of clavate setae is anteriorly oval in *C. toadshow*, does not reach the anterior margin, and is without a median band (fig. 24); the fangs are long and crossed with laterally directed tips (fig. 24). Females can be easily distinguished from all other *Cavisternum* species by their rectangular dark epigastric field (fig. 169).

Male: Total length 1.15. Carapace 0.50 long, 0.39 wide; abdomen 0.65 long, 0.33 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum longer than wide, with long oval field of clavate setae, covering about half of sternum width. Concavity fully covered with clavate setae (fig. 24). Chelicerae straight, fangs directed posteriorly, extremely long, crossed, with tips directed outward. Abdomen cylindrical, epigastric scutum not protruding. Cymbium-bulb complex oval with thin, medially bent embolus and rounded basal projection (figs. 166–168).

Female: Total length 1.12. Carapace 0.49 long, 0.38 wide; abdomen 0.63 long, 0.35 wide. Coloration as in male. Epigastric area with dark rectangular field, copulatory duct relatively short and the same width at each end (figs. 169, 170).

Other material examined: **AUSTRALIA: Queensland:** 13 km E of Gulf Development Road East, Normanton, 17°50'06"S, 141°07'20"E, 3 m, 4 July–12 Sep. 2006, R. Raven, B. Baehr, A. Amey, 1 ♀ (PBI_OON 00006042) (QM S81361); 16 km SSW of Normanton on road, 17°48'20"S, 141°00'48"E, 29 m, 4 July–12

Sep. 2006, R. Raven, B. Baehr, A. Amey, 1 ♂ (PBI_OON 00006225) (QM S75264); 1 km E on Gulf Development Road, S of Normanton, 17°44'19"S, 141°03'08"E, 20 m, 4 July–12 Sep. 2006, R. Raven, B. Baehr, A. Amey, 2 ♀ (PBI_OON 00006136) (QM S75171).

Distribution: This species is found in northeastern Queensland near the Gulf of Carpentaria (map 3).

Cavisternum waldockae, new species

Figures 25, 171–173, map 1

Type: **AUSTRALIA: Western Australia:** Male holotype from Drysdale River National Park, N of Larryoo, 14°51'S, 126°49'E (12 June 1992; M.S. Harvey, J.M. Waldock) (PBI_OON 00005444), deposited in WAM (T78181). Paratype: 1 male from Drysdale River National Park, N of Larryoo, 14°51'S, 126°49'E, 12 June 1992, M.S. Harvey, J.M. Waldock (PBI_OON 00005442) (WAM T78182).

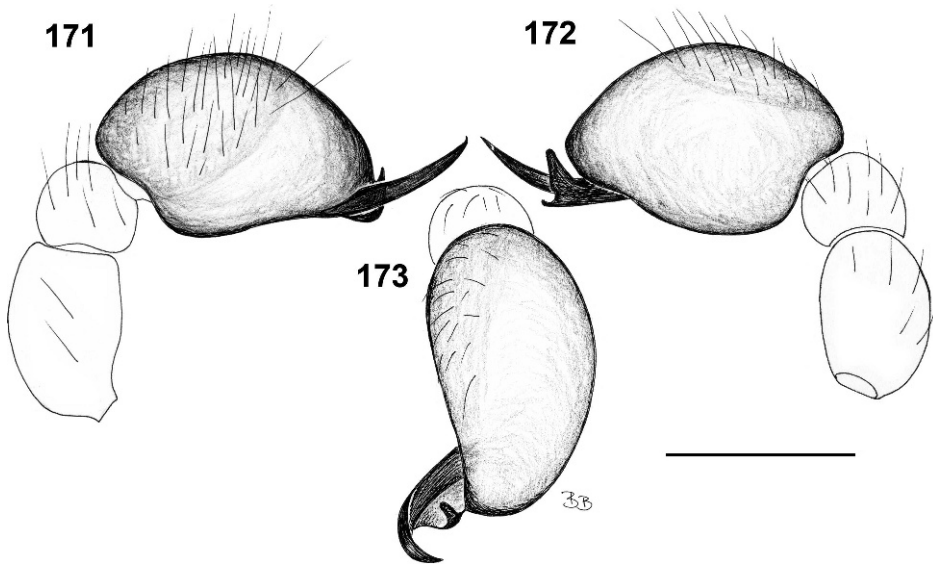
Etymology: The specific name is a patronym in honor of Julianne Waldock from the Western Australian Museum, who collected the holotype.

Diagnosis: Males of *C. waldockae* resemble those of *C. bertmaini*, with both possessing long cheliceral fangs positioned in a V shape and in the general shape of the palp. *Cavisternum waldockae* differs in having a longer, oval-shaped sternal concavity, which occupies $\frac{2}{3}$ of the sternum (fig. 25).

Male: Total length 1.15. Carapace 0.56 long, 0.41 wide; abdomen 0.59 long, 0.35 wide. Carapace, sternum, mouthparts, and abdominal scutae pale orange, legs yellow. Sternum as long as wide, with oval field of clavate setae, covering about half of sternum width (fig. 25). Cheliceral fangs directed posteriorly forming a V shape, elongated, about $\frac{2}{3}$ of paturon long, tips distally widened. Abdomen ovoid, epigastric scutum slightly protruding. Cymbium-bulb complex ovoid, bearing a long, medially bent embolus with a biarticulate basal apophysis (figs. 171–173).

Female: Unknown.

Distribution: This species is only known from a single location in the Drysdale River National Park, in northeastern Western Australia (map 1).



Figs. 171–173. *Cavisternum waldockae*, new species, male palp (PBI_OON 05444). **171.** Prolateral view. **172.** Retrolateral view. **173.** Dorsal view.

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