

A REVIEW OF THE TASMANIAN SPECIES OF PARARCHAEIDAE AND HOLARCHAEIDAE (ARACHNIDA, ARANEAE)

M.G. Rix: Queensland Museum, PO Box 3300, South Brisbane,
Queensland 4101, Australia

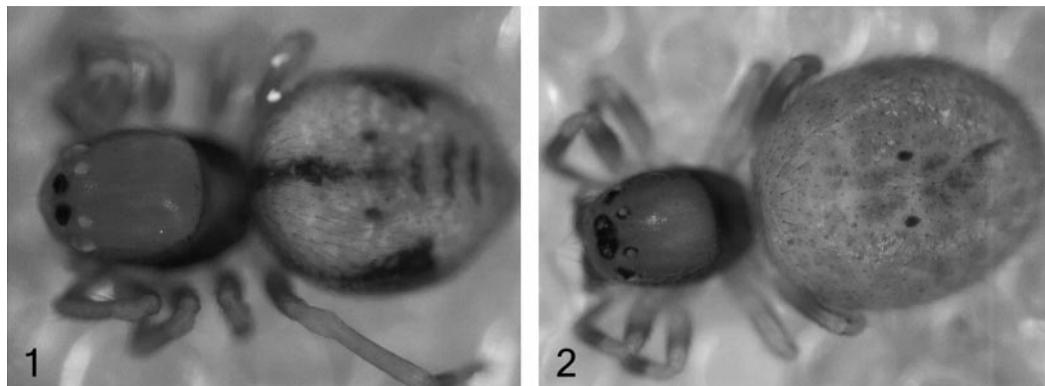
ABSTRACT. The Tasmanian species of Pararchaeidae and Holarchaeidae are revised and higher species-group relationships within the Pararchaeidae are examined. Three new species of *Pararchaea* Forster are described and the genitalia of *P. corticola* Hickman, *P. ornata* Hickman, *P. saxicola* Hickman and *P. bryophila* Hickman are redescribed, the receptacula of *P. ornata*, *P. saxicola* and *P. bryophila* for the first time. The male of *P. ornata* is newly described. With the addition of *P. hickmani* new species, *P. lulu* new species and *P. robusta* new species, the Tasmanian pararchaeid fauna is enlarged to include seven species. *Holarchaea globosa* (Hickman) is rediagnosed and the female genitalia and male are described and illustrated for the first time. Biological information is included where known.

Keywords: Tasmania, *Pararchaea*, *Holarchaea*, taxonomy, new species, Australia

The Pararchaeidae and Holarchaeidae are monogeneric families of small (0.8–3.2 mm), entelegyne, araneomorph spiders, known only from Australia and New Zealand (Forster & Platnick 1984). Both groups belong to the widely-known, tetrafamilial ‘archaeid assemblage’, sharing with the Afrotropical, Malagasy and Australian Archaeidae and the New Zealand and Chilean Mecysmaucheniidae an anterior cephalothoracic foramen completely surrounding the cheliceral bases (Forster & Platnick 1984). While probably more diverse, and clearly more widespread in the past (with two genera of fossil Archaeidae known from European Baltic amber), the four families together form a relatively speciose clade of extant palpimanoid spiders. Certainly, only a small proportion of the Australian species of *Pararchaea* Forster, and the New Zealand species of *Holarchaea* Forster, are currently named, despite extensive collections present in museums. This work is a contribution to the task of elucidating this rich alpha-diversity, reviewing in full the known pararchaeid and holarchaeid spider species of Tasmania. Higher species-group relationships within the Pararchaeidae are also examined, and biological information is summarized for all taxa where known.

The Pararchaeidae and Holarchaeidae share similar, largely linked, taxonomic histories. The first species in both families were de-

scribed by Forster (1949), with *Pararchaea rubra* (Forster 1949) initially placed in the genus *Zearchaea* Wilton 1946 and *Holarchaea novaeseelandiae* (Forster 1949) in the genus *Archaea* Koch & Berendt 1854; both taxa were included in the family Archaeidae. The genera *Pararchaea* and *Holarchaea* were subsequently erected by Forster (1955), the former expanded to include the generic type *P. alba* Forster 1955 from New Zealand and *P. binnaburra* Forster 1955 from the Lamington Plateau, south-eastern Queensland. Forster (1955: 398) noted that “the close relationship shown between the Australian species *P. binnaburra* and *P. alba* is of great interest in that it provides yet another indication of the close affinity of a section of the Australian cryptozoic fauna with that of New Zealand.” Four more species of Australian *Pararchaea* were described by Hickman (1969) from Tasmania, followed by the holarchaeid *Holarchaea globosa* (Hickman 1981), from south-western Tasmania. Forster & Platnick (1984) erected the monogeneric, entelegyne families Pararchaeidae and Holarchaeidae, along with the Mecysmaucheniidae and the newly delimited Archaeidae, recognizing the heterogeneous nature of the four taxa. Thus the Archaeidae (formerly a generic ‘dumping ground’ for taxa for over 100 years) was finally restricted to include, among extant taxa, only three genera from South Africa, Madagascar and mainland



Figures 1–2.—*Pararchaea* species: 1. *P. ornata*, holotype female, dorsal view, showing abdominal coloration; 2. *P. saxicola*, allotype female, dorsal view. Note the clearly procurved posterior margin of the pars cephalica on both specimens.

Australia, all united by haplogyne genitalia and an extreme elevation of the pars cephalica (Forster & Platnick 1984).

METHODS

All specimens were described and illustrated in 75% ethyl alcohol, or from scanning electron micrographs. Female genitalia were cleared in lactic acid. Digital photographs were taken through binocular and compound microscopes and cleared epigynes were temporarily mounted on glass cavity slides with 100% glycerine. All measurements are in millimetres and taken from camera lucida projection. All illustrations are by the author.

Abbreviations.—AME = anterior median eyes; ALE = anterior lateral eyes; ALS = anterior lateral spinnerets; DS1 = dorsal sigillum 1 (anterior left); DS2 = dorsal sigillum 2 (anterior right); DS3 = dorsal sigillum 3 (posterior right); DS4 = dorsal sigillum 4 (posterior left); DSP1 = dorsal sigilla pair 1 (anterior); DSP2 = dorsal sigilla pair 2 (posterior); DSQ = dorsal sigilla quadrangle; PME = posterior median eyes; PLE = posterior lateral eyes; PMS = posterior median spinnerets; PLS = posterior lateral spinnerets; PTA = peg tooth group A; PTB = peg tooth group B; PTC = peg tooth group C; SEM = scanning electron micrograph; TAS = Tasmania; VS1 = ventral sigillum 1 (anterior left); VS2 = ventral sigillum 2 (anterior right); VS3 = ventral sigillum 3 (posterior right); VS4 = ventral sigillum 4 (posterior left); VSP1 = ventral sigilla pair 1 (anterior); VSP2 = ventral sigilla

pair 2 (posterior); VSQ = ventral sigilla quadrangle.

Specimens examined are located in the following repositories: Australian Museum, Sydney (AMS); Queensland Museum, Brisbane (QM); Queen Victoria Museum, Launceston (QVM); Museum of Victoria, Melbourne (VICM).

SYSTEMATICS

Family Pararchaeidae Forster & Platnick
Pararchaeidae Forster & Platnick 1984: 65.

Type genus.—*Pararchaea* Forster, by original designation.

Diagnosis.—The Pararchaeidae can be distinguished from all other spider families by chelicerae arising from a distinct, ventrally sclerotized foramen (as in Archaeidae and Mecysmaucheniidae), in combination with entelegyne female genitalia (Forster & Platnick 1984). Pararchaeid spiders can also be recognized by having the combination of the following characters: anterior tarsi longer than metatarsi, stout peg teeth on the distal prolateral chelicerae, non-reduced female pedipalps, squamate cephalothoracic cuticle with hairs only on the pars-cephalica and a distinctively procurved posterior margin to the pars-cephalica in dorsal view (Figs. 1, 2).

Distribution.—The Pararchaeidae are known only from Australia and New Zealand. Within Australia, numerous specimens have been collected from north-eastern, middle-eastern and south-eastern Queensland, eastern

New South Wales, Victoria, Tasmania and southwestern Western Australia.

Remarks.—Spiders of the family Pararchaeidae are most similar in body form and size to certain Mecysmaucheniidae, namely *Aotearoa magna* (Forster 1949) from New Zealand. If the number of spinnerets on the latter is noted, however (*Aotearoa* with two spinnerets, *Pararchaea* with six), then the Pararchaeidae is unlikely to be confused with any other Araneae, especially in Australia where mecysmaucheniid spiders are apparently absent.

Pararchaea Forster 1955

Pararchaea Forster 1955: 397; Hickman 1969: 3; Forster & Platnick 1984: 71.

Type species.—*Pararchaea alba* Forster 1955, by original designation.

Diagnosis.—As for family.

Generic description.—In part from Forster & Platnick 1984.

Cephalothorax: Carapace, when viewed laterally, rhomboidal. Pars cephalica rising steeply from pars thoracica above level of coxae III or IV; highest centrally or posteriorly, sloping towards eyes. Viewed dorsally, carapace rounded or oval with rounded lateral indentations; posterior, procurved margin of pars cephalica appearing clearly demarcated from rest of carapace (Figs. 1 & 2). Carapace cuticle squamate, without tubercles or mounds. Eight eyes in two rows; laterals pearly-white, contiguous, widely separated from medians; AME closely spaced, dark-colored; PME pearly-white, well separated from each other and AME. Carapace mainly devoid of hairs, except on dorsal and dorso-lateral aspect of pars cephalica and around eyes and clypeus. Anterior margin of carapace encircling bases of chelicerae, with sclerotized cuticle extending ventrally to form antero-ventrally-facing oval foramen. Ventral suture below foramen completely or incompletely fused with sclerotized cuticle; if latter with thin longitudinal division. Clypeus extending antero-ventrally in front of eyes; longest medially (forming dorsal margin of foramen). Lateral margins of pars-thoracica smoothly indented, with or without small (separate) triangular inter-coxal sclerites projecting ventrally between coxae; the latter meeting and sometimes fusing with sternal projections. If without intercoxal sclerites, carapace either

fused to or separate from sternum. Sternum not much longer than wide, posteriorly obtuse; cuticle squamate, usually fused with posterior carapace around petiole. Maxillae directed across labium; serrula a single row of teeth. Labium triangular, wider than long; not re-bordered.

Chelicerae: Paturon relatively long, sometimes elongate, proximally constricted; cuticle finely reticulated or squamate. Pronounced keel extending down ventral surface of paturon; originating about a third of length from proximal end, continuing to behind distal tip of non-extended fang. Fang relatively short, strongly curved. Pored cheliceral gland mound situated between distal end of keel and tip of non-extended fang; in some species associated with ridged spur. Promargin adjacent to fang with three groups (PTA, PTB, PTC) of stout peg teeth, each tooth with raised socket basally; PTA with 5–6 contiguous teeth directly adjacent to non-extended fang; PTC with 3 larger teeth on promargin of outer surface; PTB with 1–3 teeth between PTA and PTC. Outer surface of paturon of males with or without transverse stridulatory ridges. Retrolateral surface of paturon with strong, smooth, moveable hairs (erected upon full opening of chelicerae).

Legs and female pedipalp: Legs (longest to shortest: 4, 1, 2, 3) relatively short, cuticle squamate, clothed with slender serrate or smooth hairs; no spines or scopulae. Single trichobothrium on metatarsi, 2–4 on tibiae; bothria well developed with smooth posterior hood. Tarsi longer than metatarsi (excluding Leg IV of some species), with three claws; upper claws with single row of teeth, inferior claw with single medial tooth. Tip of tarsi with modified serrate hairs; base sometimes distinctly swollen. Tarsal organ capsulate. Femur I usually with proximal, dorsally curved row of retrolateral denticles; in some species forming an apparent stridulatory mechanism with prolateral file on femur II. Female pedipalp entire, without claw; usually with several long, stiff hairs prolaterally.

Abdomen: Abdomen, when viewed dorsally, broadly oval without tubercles. Cuticle coriaceous; clothed with short to long smooth or serrate hairs. Petiole encircled by sclerotized cuticle; often extending posteriorly on males to cover epigastric region and anterior face of abdomen (forming anterior sclerite). Small to

large, variably-shaped dorsal scute present on males. Dorsal abdomen with anterior (DSP1) and posterior (DSP2) pair of oval or circular, small (DS1 & DS2) to large (DS3 & DS4) sigilla, forming quadrangle (DSQ) antero-centrally. Ventral abdomen also with anterior (VSP1) and posterior (VSP2) pair of subequal, circular sigilla (VS1-4), forming quadrangle (VSQ) centrally. Internal darkened sclerotic invaginations usually visible around tracheal opening and along posteriorly-converging lines either side of VSQ. Book lung covers and external epigyne of females separately sclerotized; intromittent pores surrounded by an epigynal sclerite. Post-epigastric sclerites present on males and females; small and square or triangular on females, significantly enlarged and usually fused to anterior sclerite on males. Six spinnerets, fully developed; surrounded ventrally and/or dorsally by separate sclerites, or encircled by sclerotized cuticle. Posterior tracheal opening situated closely anterior to colulus, surrounded by extended spinneret sclerite, or by separate tracheal sclerite on females of most species. Colulus small, conical, with two posteriorly projecting hairs.

Male genitalia: Epiandrous glands composed of spigots arising in clusters either side

of genital opening; spigots with shared, raised sockets. Male palpal patella and tibia without processes. Cymbium spoon-shaped with prominent retrolateral apophysis (paracymbium) proximally, of variable (usually distinctive) shape. Bulb large, extending over full length of cymbium; embolus spinous, arising from base and curving around prolateral margin of bulb. Sclerotized distal plate situated over bulb, distal to base of embolus; usually complex with one or more apophyses and ornate cuticular microstructure.

Female genitalia: Epigyne with pair of separate (although sometimes broadly touching), thick-walled, variously lobed receptacula, composed of internal systems of ducts and chambers; a single distinct fertilization duct leads from each receptaculum into bursal cavity, bending outwardly or prolaterally (often only visible when cleared epigyne are viewed laterally).

Included species.—*Pararchaea alba* Forster 1955, *P. binnaburra* Forster 1955, *P. bryophila* Hickman 1969, *P. corticola* Hickman 1969, *P. hickmani* new species, *P. lulu* new species, *P. ornata* Hickman 1969, *P. robusta* new species, *P. rubra* (Forster 1949), *P. saxicola* Hickman 1969.

Key to the Tasmanian species of *Pararchaea*

1. Males 2
 Females 8
2. Dorsal abdomen with distinctive anterior cardiac stripe and posterior chevrons
 *Pararchaea ornata* Hickman
 Dorsal abdomen not patterned as above 3
3. Retrolateral femur I with dorsally curved row of proximal denticles; proximal tarsus I not distinctly swollen; postero-dorsal aspect of pars cephalica without medial indentation ... 4
 Retrolateral femur I without dorsally curved row of proximal denticles; proximal tarsus I distinctly swollen; postero-dorsal aspect of pars cephalica with medial indentation (Fig. 10) *Pararchaea bryophila* Hickman
4. Dorsal scute small, not extending posterior to level of DSP2 5
 Dorsal scute large, extending posterior to level of DSP2 6
5. Dorsal scute roughly circular (Fig. 16) *Pararchaea hickmani* new species
 Dorsal scute very small, transversely elongate (Fig. 11) *Pararchaea saxicola* Hickman
6. Dorsal scute longitudinally elongate, pale in color (Fig. 22); paracymbium distally 'star-shaped' (Fig. 21) *Pararchaea lulu* new species
 Dorsal scute roughly as long as wide, dark brown in color; paracymbium not distally 'star-shaped' 7
7. Cymbium with retrolateral lobe-like extension at base of paracymbium (Fig. 12); paracymbium with two divergent apophyses; post-epigastric sclerites not extending posterior to level of VSP1 *Pararchaea corticola* Hickman
 Cymbium without retrolateral lobe-like extension at base of paracymbium; paracymbium

- a single, distally rounded, curved projection (Fig. 26); post-epigastric sclerites extensive, extending posterior to level of VSP1 (Fig. 28) *Pararchaea robusta* new species
- 8. Retrolateral femur I with dorsally curved row of proximal denticles 9
Retrolateral femur I without dorsally curved row of proximal denticles
. *Pararchaea bryophila* Hickman
- 9. External epigyne distinctive, as illustrated in Fig. 8 *Pararchaea corticola* Hickman
External epigyne not as illustrated in Fig. 8 10
- 10. Dorsal abdomen with distinctive anterior cardiac stripe and posterior chevrons (Fig. 1) . .
. *Pararchaea ornata* Hickman
Dorsal abdomen not patterned as above 11
- 11. Receptacula large, 'comma-shaped', broadly touching along inward margins (Fig. 6) . . .
. *Pararchaea saxicola* Hickman
Receptacula otherwise 12
- 12. Receptacula oval-shaped, posteriorly convergent (Fig. 5) . . *Pararchaea robusta* new species
Receptacula otherwise 13
- 13. Receptacula with prominent, 'nose-like' inward lobes (Fig. 4); abdomen without 'marbled'
coloration in life *Pararchaea lulu* new species
Receptacula without prominent, 'nose-like' inward lobes (Fig. 3); abdomen with 'marbled'
coloration in life *Pararchaea hickmani* new species

Pararchaea bryophila Hickman 1969
(Figs. 7, 9–10)

Pararchaea bryophila Hickman 1969: 9, figs. 25–30; Schütt 2000: 137, figs. 2, 6, 7, 10.

Type material.—Holotype male, Punch Bowl Reserve, Launceston, Tasmania, Australia, 41°25'S, 147°7'E, 24 August 1929, moss, V.V. Hickman (AMS KS 6633). Allotype female, same data as holotype (AMS KS 6634).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♂, 1 ♀, Launceston (AMS KS 54300); 1 ♀, Point Sorell (QVM 13: 17998); 1 ♀, no locality data (QVM 13: 23869); 1 ♂, 1 ♀, northeast TAS (AMS KS 25985); 1 ♂, King River (AMS KS 65966); 1 ♂, West Downs via Ridgely (AMS KS 66072); 2 ♀, same data (AMS KS 66078); 1 ♀, Dip River Falls (AMS KS 66038); 1 ♀, ~3 km S of Waratah Junction on Murchison Hwy (AMS KS 66088); 2 ♂, Punch Bowl Reserve, Launceston (AMS KS 28721); 1 ♂, 2 ♀, same data (AMS KS 54295).

Diagnosis.—Male and female *P. bryophila* can be distinguished from all other known Tasmanian congeners by the absence of retrolateral denticles on the femur of leg I and their small size.

Description.—*Male* (AMS KS 66072): Pedipalp (Fig. 9): paracymbium large, 'sickle-shaped', with two divergent projections. Distal plate with two prominent, pro-distally directed apophyses.

Female (QVM 13: 17998): Epigyne (Fig. 7): receptacula posteriorly convergent, together forming 'V-shape'; each receptaculum with 'nose-like' inward lobe.

Distribution and habitat.—*Pararchaea bryophila* appears to be widespread in Tasmania. Hickman (1969) recorded that the types were collected from moss.

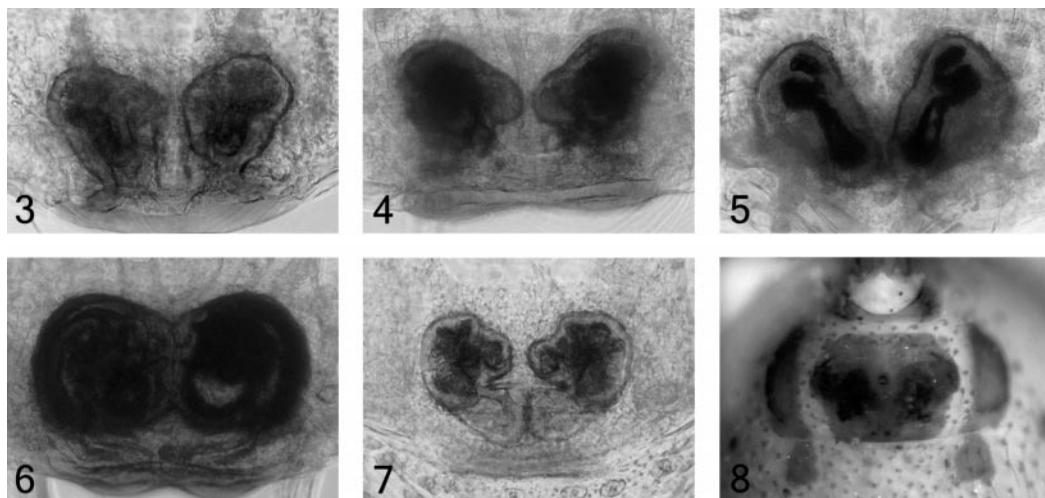
Pararchaea corticola Hickman 1969
(Figs. 8, 12)

Pararchaea corticola Hickman 1969: 3, figs. 10–15.

Type material.—Holotype male, The Queen's Domain, Hobart, Tasmania, Australia, 42°52'S, 147°19'E, 24 May 1937, under the loose bark of eucalypts, V.V. Hickman (AMS KS 6635). Allotype female, same data as holotype except March 1955 (AMS KS 6636).

Diagnosis.—Female *P. corticola* can be distinguished from all other known Tasmanian congeners by the large size and the characteristic shape of the external epigyne (Fig. 8). Males can be distinguished from all other known Tasmanian congeners by the retrolateral lobe-like extension on the cymbium (at base of paracymbium; Fig. 12), and the presence of an oval sclerite surrounding VSP2.

Description.—*Male* (holotype AMS KS 6635): Pedipalp (Fig. 12): paracymbium large, with two divergent apophyses. Cymbium with retrolateral, lobe-like extension at base of paracymbium. Distal plate extended distally to



Figures 3–8.—Epigynes of *Pararchaea* species: 3–7. Cleared receptacula, dorsal view. 3. *P. hickmani*; 4. *P. lulu*; 5. *P. robusta*; 6. *P. saxicola*; 7. *P. bryophila*; 8. *P. corticola*, allotype female external epigyne, ventral view.

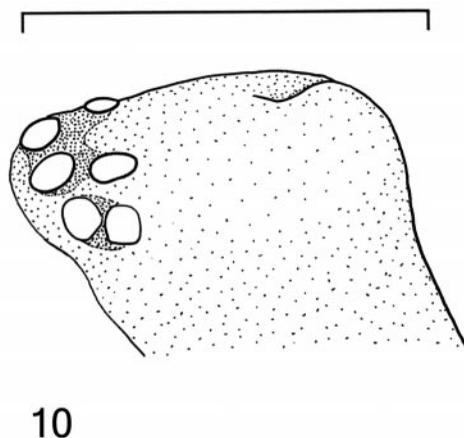
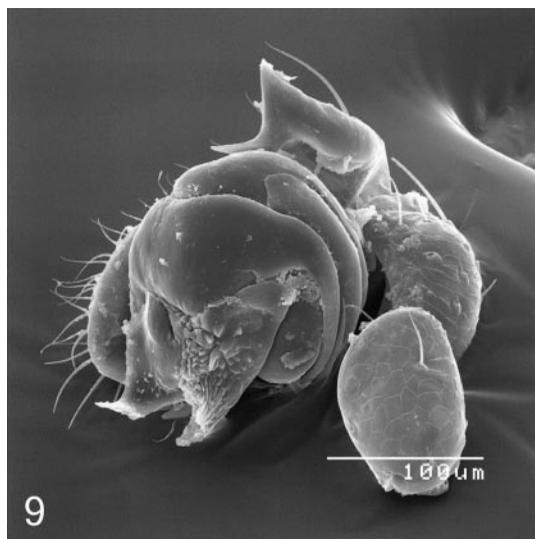
form prominent ‘conductor’ around tip of embolus.

Female (allotype AMS KS 6636): Epigyne (Fig. 8): as the allotype was the only female specimen of this species examined, the epigyne was not dissected. The external appearance is, however, characteristic, and sufficient for identification.

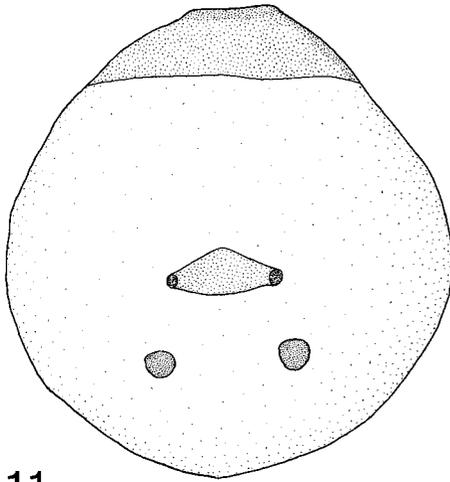
Distribution and habitat.—*Pararchaea*

corticola is known only from the Queen’s Domain, Hobart, Tasmania. Hickman (1969) recorded that the types were collected from under the loose bark of eucalypts.

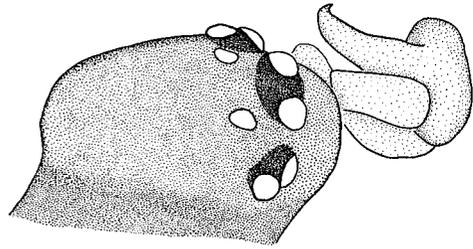
Remarks.—I conducted field work at the Queen’s Domain in January and February 2002, but found no evidence of this or any other *Pararchaea* species (despite targeted collecting). The forest was mainly dominated



Figures 9–10.—*Pararchaea bryophila*, male: 9. Left pedipalp, retro-ventral view, showing ornate distal plate and distinctive paracymbium; 10. Carapace, dorso-lateral view, showing medial indentation. Scale bar = 0.5 mm.



11



12

Figures 11–12.—*Pararchaea* species: 11. *P. saxicola*, holotype male abdomen, antero-dorsal view, showing small dorsal scute; 12. *P. corticola*, holotype male carapace and pedipalp, dorso-lateral view, showing retrolateral lobe-like extension at base of paracymbium. Scale bars = 0.5 mm.

by *Eucalyptus* trees and extensive grassland, and signs of a recent and widespread fire were apparent.

***Pararchaea hickmani* new species**
(Figs. 3, 13–17)

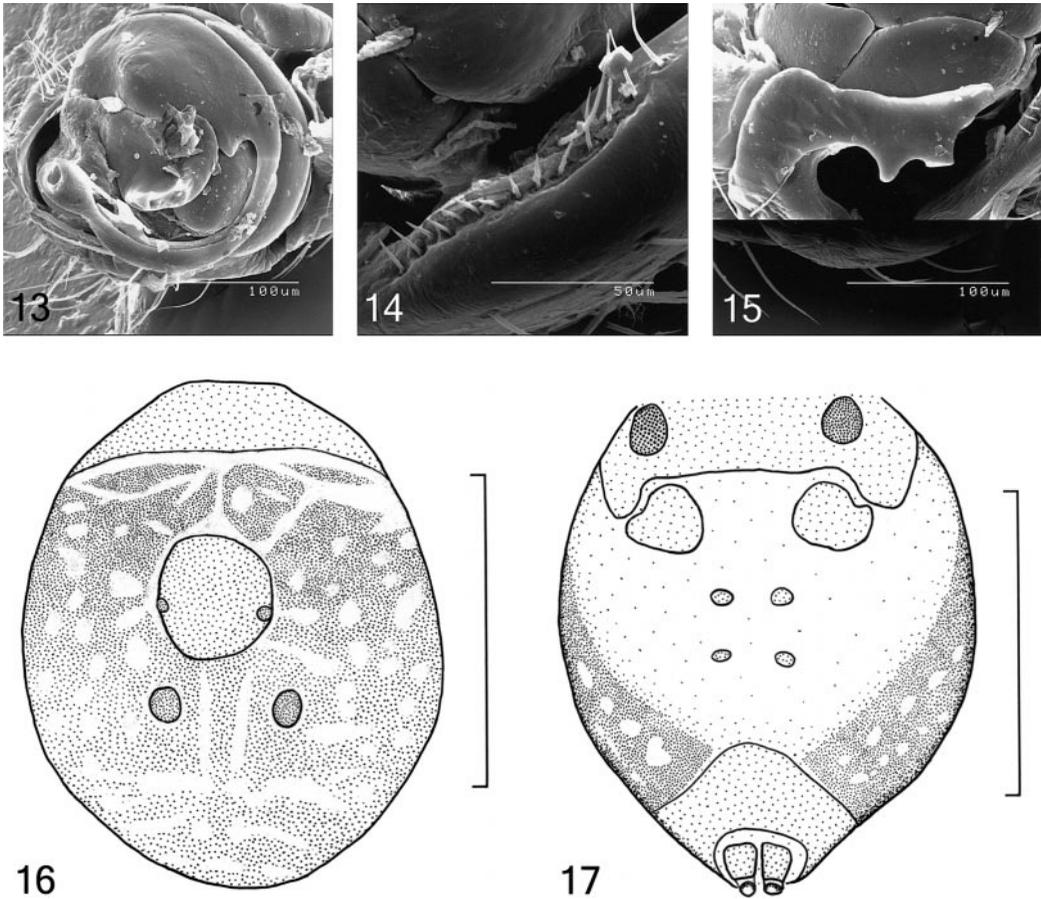
Type material.—Holotype male, Strathgordon, Tasmania, Australia, 42°46'S, 146°03'E, 17 January 2002, sifted from moss in forested valley overlooking inbound highway, M. Rix (AMS KS 82657). Allotype female, end of Basils Rd, West Downs via Ridgely, Tasmania, Australia, 42°20'S, 145°39'E, 1 December 1978, S737, map/grid reference 8015–853229, litter, D. DeLittle (AMS KS 82658).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♀, Waterhouse Point (QVM 13: 46); 1 ♀, same data (QVM 13: 3244); 1 ♀, same data (QVM 13: 3212); 1 ♂, same data (QVM 13: 46); 1 ♀, same data (QM S16727); 1 ♂, Gordon River Road near Maydena (QM S60759); 1 ♂, 1 ♀, Mount Barrow (AMS KS 54299); 2 ♂, Punchbowl Reserve, Launceston (AMS KS 28719); 2 ♂, McPartlan Pass (QM S60758); 1 ♂, same data (QM S60760); 1 ♂, same data (QM S60761).

Diagnosis.—Female *P. hickmani* can be distinguished from all other known Tasmanian congeners by the 'marbled' abdominal coloration (in life), and the shape of the receptacula (the latter without distinct, 'nose-like' inward

lobes; Fig. 3). Males can be distinguished from all other known Tasmanian congeners by the 'marbled' abdominal coloration (in life), and the small, circular dorsal scute (Fig. 16).

Description.—*Male* (holotype AMS KS 82657): Carapace 0.68 long, 0.45 wide. Abdomen 0.85 long, 0.63 wide. Total length 1.53. Color: carapace mustard-yellow. Abdomen pale cream, with light brown marbled patterning dorsally. Legs uniform pale cream. Carapace: in lateral view rhomboidal; dorsal surface of pars cephalica sloping almost linearly down to AME from posterior margin. Chelicerae: stridulatory ridges present on outer surface. Dentition: PTA 5, PTB 2, PTC 3 (10). Abdomen (Figs. 16–17): circular petiolar sclerite extending dorsally and ventrally (forming anterior sclerite); extending ventrally to cover entire epigastric region; extending dorsally to cover anterior face of abdomen. Post-epigastric region separately sclerotized, with two rounded sclerites (extending to half distance of epigastric furrow to VSP1 from latter). Small, roughly circular dorsal scute anterior and posterior to DSP1. Spinnerets encircled by sclerotized cuticle, extending ventrally up to length of VSQ from latter. Ventral internal sclerotized invaginations visible laterally and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Pedipalp (Figs. 13–15): paracymbium curved, distally widened, with three small distal ex-



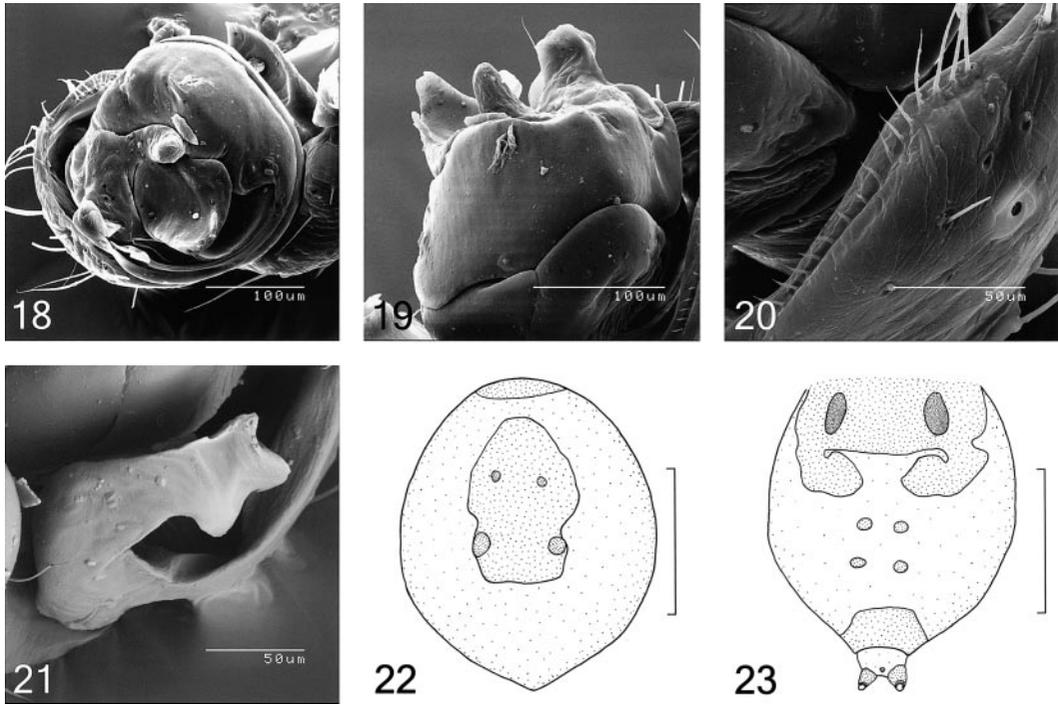
Figures 13–17.—*Pararchaea hickmani*, male: 13. Left pedipalp, ventral view, showing distally bifurcate embolus; 14. Left cymbium, retrolateral view, showing brush of hairs in groove; 15. Paracymbium of left pedipalp, retrolateral view, showing distinctive distal shape; 16. Abdomen, dorsal view, showing circular dorsal scute and ‘marbled’ coloration; 17. Abdomen, ventral view, showing separate post-epigastric sclerites. Scale bars = 0.5 mm.

tensions. Distal plate complex, with median apophyses. Embolus distally bifurcate. Cymbium with brush of hairs in groove along retrolateral edge. Legs: femur I with dorsally curved row of 5 retrolateral denticles.

Female (allotype AMS KS 82658): Carapace 0.73 long, 0.48 wide. Abdomen 1.11 long, 0.82 wide. Total length 1.84. Color: carapace brownish-yellow. Abdomen mustard-yellow, with very light brown marbled patterning dorsally. Legs uniform mustard-yellow. Carapace: in lateral view rhomboidal; dorsal surface or pars cephalica weakly convex, sloping gently down to AME from posterior margin. Chelicerae: stridulatory ridges absent on outer surface. Dentition: PTA 5, PTB 3, PTC 3 (11). Abdomen: circular petiolar sclerite encircling

petiole; not extending dorsally or ventrally. Epigyne surrounded by rectangular sclerite. Book lung covers plus triangular region posterior to each cover sclerotized. Two, small, square post-epigastric sclerites. Spinnerets encircled by sclerotized cuticle; cuticle medially constricted ventrally. Tracheal sclerite present. Ventral internal sclerotic invaginations visible laterally and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Epigyne (QVM 13: 3244; Fig. 3): receptacula anteriorly widened, rounded; inward faces roughly straight, parallel. Legs: femur I with dorsally-curved row of 5 retrolateral denticles.

Distribution and habitat.—*Pararchaea hickmani* is widespread in Tasmania, where it



Figures 18–23.—*Pararchaea lulu*, male: 18. Left pedipalp, ventral view; 19. Left pedipalp, retro-ventral view, showing prominent median apophyses of distal plate; 20. Left cymbium, retrolateral view, showing brush of hairs in groove; 21. Paracymbium of left pedipalp, retrolateral view, showing distinctive distal ‘star’ shape; 22. Abdomen, dorsal view, showing longitudinally-elongate scute; 23. Abdomen, ventral view. Scale bars = 0.5 mm.

has been collected from moss (growing on the ground and on logs) and pitfall traps. The species is known from coastal and subalpine heathland habitats, and is the dominant *Pararchaea* species in some regions (pers. obser.).

Etymology.—The specific epithet is a patronym in honor of the late Vernon V. Hickman, for his substantial contribution to the study of Tasmanian Pararchaeidae.

Pararchaea lulu new species
(Figs. 4, 18–23)

Type material.—Holotype male, Warra Forest near Geeveston, Tasmania, Australia, 43°04’S, 146°43’E, 14 April 2000, ex. log decay, D. Bashford (QVM 13: 39992). Allotype female, same data as holotype (QVM 13: 39993).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♂, Warra Forest near Geeveston (QVM 13: 39994); 1 ♂, same data (QVM 13: 39995); 1 ♀, Pump House Point, Lake St Clair (QVM 13:23690); 1 ♀, 1 ♂,

Lake Dobson Road, Mount Field National Park (QM S60757); 2 ♀, Arve Forest (AMS KS 28716); 1 ♀, Tarraleah (AMS KS 28724); 1 ♀, same data (AMS KS 28725); 1 ♀, Frodshams Pass (AMS KS 62695); 1 ♀, Mount Wellington (AMS KS 28722); 1 ♂, 1 ♀, same data (AMS KS 54298); 1 ♀, Fingal (AMS KS 28717); 1 ♀, Trevallyn (AMS KS 54296); 1 ♀, Fish River track to Walls of Jerusalem (AMS KS 54301); 1 ♂, southwest TAS (AMS KS 26475); 1 ♀, Strathgordon (AMS KS 28726).

Diagnosis.—Female *P. lulu* can be distinguished from all other known Tasmanian congeners by the pale abdominal coloration, and the shape of the receptacula (the latter with distinct, ‘nose-like’ inward lobes; Fig. 4). Males can be distinguished from all other known Tasmanian congeners by the pale abdominal coloration, the large, longitudinally-elongate dorsal scute (Fig. 22), and the distally ‘star-shaped’ paracymbium (Fig. 21).

Description.—*Male (holotype QVM 13:*

39992): Carapace 0.71 long, 0.53 wide. Abdomen 1.08 long, 0.82 wide. Total length 1.79. Color: carapace mustard-yellow. Abdomen pale yellow with mustard-yellow dorsal scute. Legs uniform light mustard-yellow. Carapace: in lateral view rhomboidal; dorsal surface of pars cephalica almost flat, except for slightly convex central region. Chelicerae: stridulatory ridges present on outer surface. Dentition: PTA 5, PTB 2, PTC 3 (10). Abdomen (Figs. 22–23): circular petiolar sclerite extending dorsally and ventrally (forming anterior sclerite); extending ventrally to cover entire epigastric and post-epigastric regions (extending to a little under half distance of epigastric furrow to VSP1 from latter); extending dorsally to cover anterior face of abdomen. Dorsal scute extending from behind posterior margin of anterior sclerite to half width of DSP2 from latter; widest posterior to DSP1, tapering anteriorly. Spinnerets encircled by sclerotized cuticle, extending ventrally up to length of VSQ from latter. Ventral internal sclerotic invaginations visible laterally and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Pedipalp (Figs. 18–21): paracymbium curved, distally widened, with three distal extensions forming ‘star-shape’. Distal plate complex, with prominent median apophyses. Embolus distally bifurcate. Cymbium with brush of hairs in groove along retrolateral edge. Legs: femur I with dorsally curved row of 4 retrolateral denticles.

Female (allotype QVM 13: 39993): Carapace 0.80 long, 0.55 wide. Abdomen 1.16 long, 0.94 wide. Total length 1.96. Color: carapace mustard-yellow. Abdomen pale cream. Legs uniform pale mustard-yellow. Carapace: in lateral view rhomboidal; dorsal surface of pars cephalica weakly convex, sloping gently down to AME from posterior margin. Chelicerae: stridulatory ridges absent on outer surface. Dentition: PTA 5, PTB 3, PTC 3 (11). Abdomen: circular petiolar sclerite encircling petiole; not extending dorsally or ventrally. Epigyne surrounded by rectangular sclerite. Book lung covers plus triangular extension posterior to each cover sclerotized. Two, small, square post-epigastric sclerites. Spinnerets encircled by sclerotized cuticle dorsally and ventrally; cuticle medially constricted ventrally. Tracheal sclerite present. Ventral internal sclerotic invaginations visible laterally

and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Epigyne (AMS KS 28716; Fig. 4): receptacula rounded, with prominent ‘nose-like’ inward lobes. Legs: femur I with dorsally curved row of 4 retrolateral denticles.

Distribution and habitat.—*Pararchaea lulu* is widespread in Tasmania, where specimens have been collected from moss and rotting logs.

Etymology.—The specific epithet is a patronym in honor of Lisa Boutin (nicknamed ‘Lulu’), personal friend of the author, and collector of many recent pararchaeid and holarchaeid specimens. The name is to be treated as a noun in apposition.

Pararchaea ornata Hickman 1969
(Fig. 1)

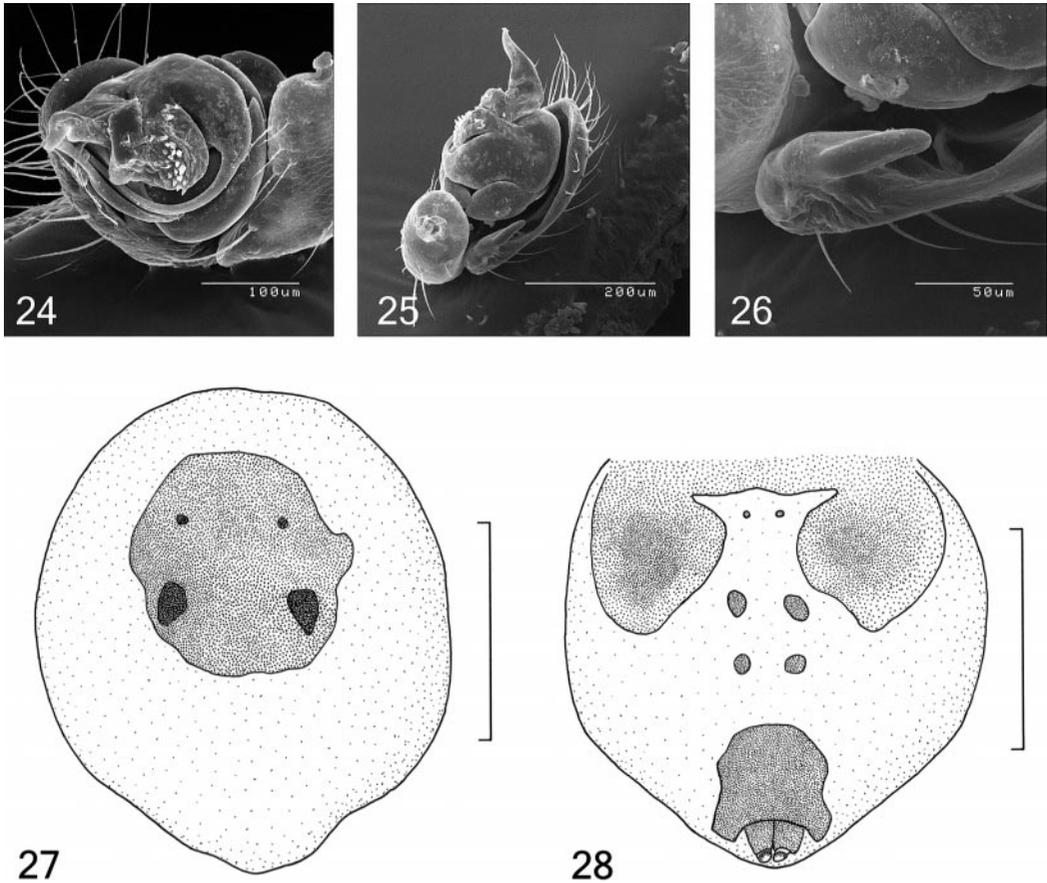
Pararchaea ornata Hickman 1969: 7, figs. 21–24.

Type material.—Holotype female, The Queen’s Domain, Hobart, Tasmania, Australia, 42°52’S, 147°19’E, 13 April 1968, shaking gorse (*Ulex europaeus*), V.V. Hickman (AMS KS 6638).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♂, 1 ♀, A3 roadside between Weldborough and Derby (QVM 13: 39996); 1 ♂, same data (QVM 13: 39997).

Diagnosis.—Female *P. ornata* can be distinguished from all other known Tasmanian congeners by the body coloration: the dorsal abdomen is pale yellowish, with dark brown posterior chevrons, a dark brown anterior cardiac stripe, and dark brown antero-lateral regions (Fig. 1). Males can also be distinguished from all other known Tasmanian congeners by the body coloration, which is similar to that of the female.

Description.—*Male (QVM 13: 39997)*: Carapace 0.65 long, 0.48 wide. Abdomen 0.87 long, 0.71 wide. Total length 1.52. Color: pars cephalica and medial posterior region of pars thoracica mustard yellow; lateral pars thoracica dark brown. Abdomen pale yellow with dark brown cardiac stripe and five dark brown chevrons dorsally; antero-lateral regions also dark brown. Legs mustard yellow; metatarsi and tarsi banded brown proximally. Carapace: in lateral view rhomboidal; dorsal surface of pars cephalica weakly convex, sloping down to AME from posterior margin. Chelicerae: stridulatory ridges absent on outer surface.



Figures 24–28.—Male *Pararchaea robusta*: 24. Left pedipalp, ventral view; 25. Left pedipalp, retro-ventral view, showing prominent distal ‘conductor’; 26. Paracymbium of left pedipalp, ventral view, showing simple, distally-rounded shape; 27. Abdomen, dorsal view; 28. Abdomen, ventral view, showing extensive post-epigastric sclerites. Scale bars = 0.5 mm.

Dentition: PTA 5, PTB 2, PTC 3 (10). Abdomen: circular petiolar sclerite extending dorsally and ventrally (forming anterior sclerite); extending ventrally to cover entire epigastric and post-epigastric regions (extending to two-thirds distance of epigastric furrow to VSP1 from latter); extending dorsally to cover anterior face of abdomen. Small, oval dorsal scute anterior and posterior to DSP1, fusing with anterior sclerite anteriorly. Spinnerets encircled by sclerotized cuticle, extending ventrally up to length of VSQ from latter. Ventral internal sclerotic invaginations visible laterally and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Pedipalp: paracymbium pointed, sinuous, with inward hook. Legs: femur I with dorsally curved row of 4 retrolateral denticles.

Female (QVM 13: 39996): Epigyne: receptacula laterally rectangular, with distinctive ‘nose-like’ inward lobes.

Distribution and habitat.—*Pararchaea ornata* is known only from southern and north-eastern Tasmania. Hickman (1969) recorded that the holotype female was collected by shaking gorse (*Ulex europaeus*, Fabaceae). The species appears to be very rare.

***Pararchaea robusta* new species**
(Figs. 5, 24–28)

Type material.—Holotype male, Frodshams Pass, Scotts Peak Road, 1.5 km west of Gordon River Road, Tasmania, Australia, 42°49’S, 146°13’E, 15 February 1990, *Nothofagus cunninghami* Sample 8, R. Coy, P. Lillywhite & A.L.Yen (VICM K-8796). Allotype

female, same data as holotype (VICM K-8797).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♀, Mount Wedge Track (QVM 13: 24033); 1 ♀, Liffey Falls (AMS KS 28713).

Diagnosis.—Female *P. robusta* can be distinguished from all other known Tasmanian congeners by the distinct, oval-shaped, posteriorly-convergent receptacula (Fig. 5). Males can be distinguished from all other known Tasmanian congeners by the extensive post-epigastric sclerites (Fig. 28).

Description.—*Male* (holotype VICM K-8796): Carapace 0.75 long, 0.50 wide. Abdomen 1.12 long, 0.93 wide. Total length 1.87. Color: carapace brown; pars thoracica darkest. Abdomen mustard-yellow, with dark brown dorsal scute. Legs mustard-yellow; femora, tibiae, metatarsi and tarsi banded brown proximally. Carapace: in lateral view rhomboidal; dorsal surface of pars cephalica weakly convex, sloping down to AME from posterior margin. Chelicerae: stridulatory ridges absent on outer surface. Dentition: PTA 6, PTB 3, PTC 3 (12). Abdomen (Figs. 27–28): circular petiolar sclerite extending dorsally and ventrally to cover entire epigastric and post-epigastric regions (extending to level between VSP1 and VSP2 behind epigastric furrow). Broadly oval dorsal scute extending from behind posterior margin of anterior sclerite to half length of DSQ behind latter; with lateral extension directly anterior to DS3. Spinnerets surrounded by sclerotized cuticle dorsally and ventrally, extending ventrally up to length of VSQ from latter. Ventral internal sclerotic invaginations visible laterally and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Pedipalp (Figs. 24–26): paracymbium simple, curved, distally rounded. Distal plate ornately sclerotized, extending distally into prominent ‘conductor’. Legs: femur I with dorsally curved row of 6 retrolateral denticles.

Female (allotype VICM K-8797): Carapace 0.94 long, 0.65 wide. Abdomen 1.33 long, 1.13 wide. Total length 2.27. Color: carapace brown; pars thoracica darkest. Abdomen mustard-yellow, with dark brown DSP2. Legs mustard-yellow; femora, tibiae, metatarsi and tarsi banded brown proximally. Carapace: in lateral view rhomboidal; dorsal surface of pars cephalica weakly convex, sloping down to

AME from posterior margin. Chelicerae: stridulatory ridges absent on outer surface. Dentition: PTA 6, PTB 3, PTC 3 (12). Abdomen: circular petiolar sclerite encircling petiole; not extending dorsally or ventrally. Epigyne surrounded by rounded rectangular sclerite. Book lung covers plus triangular extension posterior to each cover sclerotized. Two, small, truncated-triangular post-epigastric sclerites. Spinnerets surrounded by sclerotized cuticle dorsally and ventrally; cuticle medially constricted ventrally. Tracheal sclerite present. Ventral internal sclerotic invaginations visible laterally and posteriorly. Abdomen clothed with black hairs; absent on antero-lateral faces. Epigyne (AMS KS 28713; Fig. 5): receptacula oval-shaped, posteriorly convergent. Legs: femur I with dorsally curved row of 6 retrolateral denticles.

Distribution and habitat.—*Pararchaea robusta* is known only from southern and central Tasmania.

Etymology.—The specific epithet refers to the robust appearance of this species.

Pararchaea saxicola Hickman 1969
(Figs. 2, 6, 11)

Pararchaea saxicola Hickman 1969: 5, figs. 16–20.

Type material.—Holotype male, The Queen’s Domain, Hobart, Tasmania, Australia, 42°52’S, 147°19’E, 4 May 1938, *in copulo* on underside of loose stone on ground, V.V. Hickman (AMS KS 6639). Allotype female, same data as holotype (AMS KS 6640).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♀, The Queen’s Domain, Hobart (AMS KS 54297).

Diagnosis.—Female *P. saxicola* can be distinguished from all other known Tasmanian congeners by the distinctive, large, ‘comma-shaped’ receptacula, broadly touching along their inward margins (Fig. 6). Males can be distinguished from all other known Tasmanian congeners by the very small, transversely-elongate dorsal scute (Fig. 11).

Description.—*Male* (holotype AMS KS 6640): Pedipalp: bulb expanded. Paracymbium curved, with inner hook. Distal plate projecting over embolus; both interacting with paracymbium on retrolateral side.

Female (AMS KS 54297): Epigyne (Fig. 6): receptacula large, ‘comma-shaped’, broadly touching along inward margins.

Distribution and habitat.—*Pararchaea saxicola* is known only from the Queen's Domain, Hobart, Tasmania, and was collected from under stones in May 1936.

Remarks.—I conducted field work at the Queen's Domain in January and February 2002, but found no evidence of this or any other *Pararchaea* species (despite targeted collecting). The forest was mainly dominated by *Eucalyptus* trees and extensive grassland, and signs of a recent and widespread fire were apparent.

Family Holarchaeidae Forster & Platnick

Holarchaeidae Forster & Platnick 1984: 71.

Type genus.—*Holarchaea* Forster, by original designation.

Diagnosis.—The Holarchaeidae can be distinguished from all other spider families by elongate chelicerae arising from a distinct but ventrally unsclerotized foramen, in combination with entelegyne female genitalia, an absence of peg teeth on the chelicerae and a swollen (anteriorly projecting) clypeus (see Forster & Platnick 1984). Holarchaeid spiders can also be recognized by having tarsi longer than metatarsi, widened female pedipalps distally, and spherical abdomens.

Distribution.—The Holarchaeidae are known only from Tasmania and New Zealand. Despite extensive surveying of Victorian *Nothofagus* (beech) forests (Graham Milledge, pers. comm.), holarchaeid spiders have not been found on the Australian mainland.

Remarks.—The Holarchaeidae are a morphologically and biogeographically distinct spider family, unlikely to be confused (upon close examination) with any other Araneae. New Zealand *Zearchaea* (Mecysmaucheniidae) appear superficially similar to *Holarchaea*, but with only two spinnerets, peg teeth, and a foramen completely surrounded by sclerotized cuticle, the former genus is easily distinguished.

Holarchaea Forster 1955

Holarchaea Forster 1955: 392; Forster & Platnick 1984: 76.

Type species.—*Archaea novaeseelandiae* Forster 1949, by original designation.

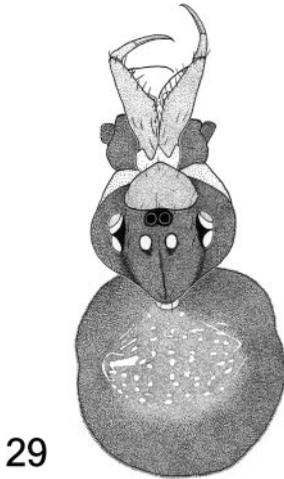
Diagnosis.—As for family.

Generic description.—In part from Forster & Platnick 1984.

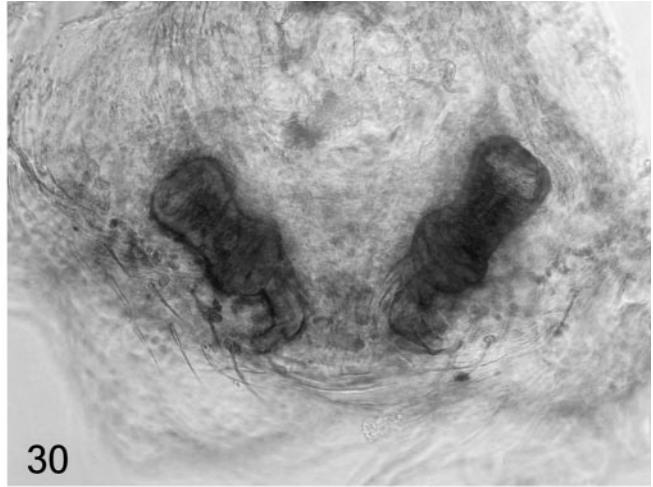
Cephalothorax: Carapace, when viewed laterally, anteriorly raised or triangular. Pars cephalica rising steeply from pars thoracica above level of coxa III. Lateral pars thoracica with furrow ventro-lateral to pars cephalica, dorsal pars thoracica slightly concave centrally. Viewed dorsally, carapace rounded; posterior margin of pars cephalica appearing demarcated from rest of carapace, extending to PLE. Carapace cuticle without tubercles, sometimes punctate. Eight eyes in two rows; laterals contiguous, pearly-white, widely separated from medians; AME smallest, circular, closely-spaced, dark-colored; PME oval, pearly-white, well separated. Carapace mainly devoid of hairs, except on postero-dorsal aspect of pars cephalica, clypeus and around eyes. Anterior margin of carapace encircling bases of chelicerae, with unsclerotized cuticle extending ventrally to form antero-ventrally-facing oval foramen. Clypeus large, swollen, projecting anteriorly and laterally around bases of chelicerae, connecting with sclerotized cuticle of anterior carapace ventro-laterally; longest medially (forming dorsal margin of foramen). Margin of pars thoracica smoothly curved, with separate, elongate sclerite above coxae III and IV on each side. Sternum longer than wide, posteriorly obtuse; cuticle lightly punctate. Maxillae directed across labium, not meeting in middle; serrula a single row of teeth. Labium triangular, wider than long; strongly rebordered.

Chelicerae: Paturon (Figs. 34 & 35) relatively long, elongate, constricted proximally; cuticle finely reticulated. Fang (Figs. 34–36) long, distally curved, usually hooked at tip, with raised, finely serrated prolateral edge (Fig. 36); divided at one third of length from base by transverse groove; without poison gland opening. Two or three true slender teeth on prolateral margin of paturon (Fig. 35); peg teeth absent. Pored cheliceral gland mound situated near tip of non-extended fang; retro-laterally-adjacent to proximal tooth. Hairs sparse; several filiform.

Legs and female pedipalp: Legs (longest to shortest: 1, 4, 2, 3) relatively long, slender, cuticle finely reticulated, clothed with slender smooth or weakly serrate hairs; no spines or scopulae. Single trichobothrium on metatarsi, 2 or 3 on tibiae; bothria well developed with smooth posterior hood. Tarsi longer than metatarsi, with three smooth claws; tarsi I and



29



30

Figures 29–30.—*Holarchaea globosa*: 29. Male cephalothorax and abdomen, antero-dorsal view; 30. Cleared female receptacula, dorsal view, showing bilobed morphology of each receptaculum.

II with reduced claws. Distal quarter of tarsi I and II more slender than proximal three-quarters; often with group of modified, strongly serrate hairs raised on low mounds, surrounding discoid organs of unknown function. Tarsal organ capsulate. Tibia and tarsus of female pedipalp shortened, widened, partially fused; with brush of long hairs ventrally; without claw.

Abdomen: Abdomen spherical or globose. Cuticle thin, without scutes or surface swellings; clothed with short hairs. Female epigyne a single slit-like opening, shortly anterior to epigastric furrow; lightly sclerotized, obscured by posterior of sternum in live animals and many specimens. Anterior respiratory openings lightly sclerotized. Six spinnerets; ALS largest, PMS smallest. Posterior tracheal spiracle absent. Colulus linguiform, with two posteriorly projecting hairs.

Male genitalia: Pedipalp (Figs. 31–33) with coiled embolus encircling bulb two or three times. Ventral surface of bulb relatively smooth (Fig. 32), without prominent apophyses. Cymbium spoon-shaped, with or without spine-like proximal retrolateral apophysis (Fig. 33). Patella and tibia variably-shaped, with spur-like processes distally (Fig. 33).

Female genitalia: Epigyne with single slit-like opening leading to pair of unilobed or bilobed receptacula (Fig. 30); each receptaculum with short, proximal, spur-like fertilization duct leading into bursal cavity.

Included species.—*Holarchaea globosa* (Hickman 1981), *H. novaeseelandiae* (Forster 1949).

Holarchaea globosa (Hickman 1981)
(Figs. 29–36)

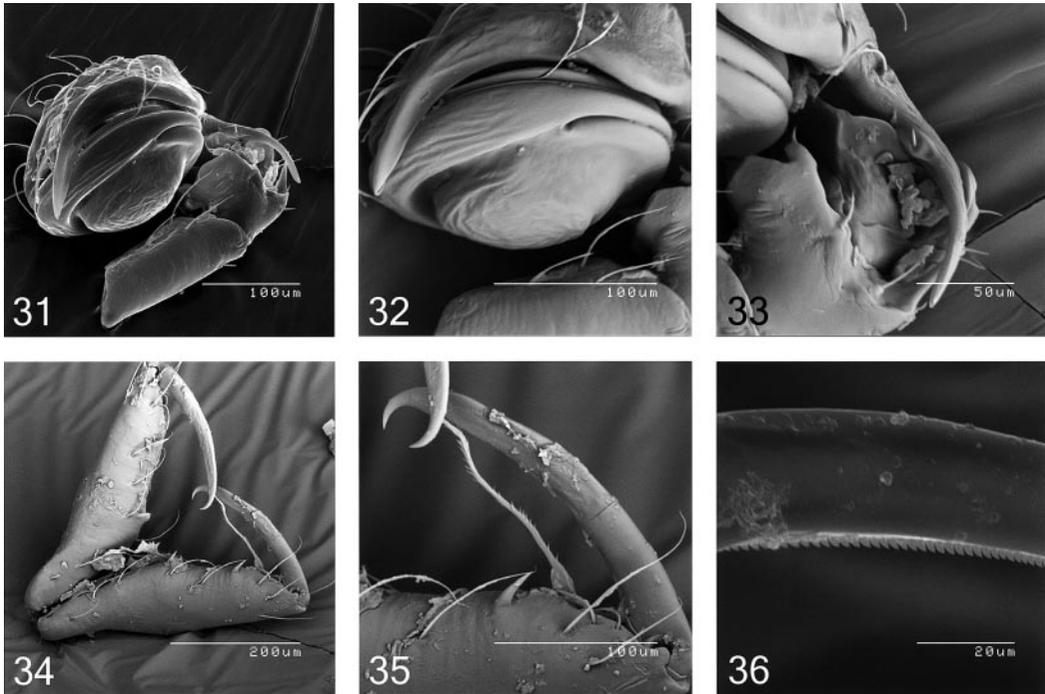
Zearchaea globosa Hickman 1981: 47, figs. 1–5.

Holarchaea globosa (Hickman): Forster & Platnick 1984: 76.

Type material.—Holotype female, Strathgordon, Tasmania, Australia, 42°46'S, 146°03'E, 25 April 1978, from moss, V.V. Hickman (AMS KS 6987).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♂, 1 ♀, Hogarth Falls Walk, People's Park, Strahan (QM S60756); 1 ♀, Main Cave (MU201–13v E-Tw-Tr), Montagu (QVM 13:12671); 1 ♀, same data (AMS KS 29515); 5 ♀, 2 ♂, Andrew River Caves, Western Heritage Area (AMS KS 21290); 1 ♀, Cuckoo Falls Walk, southeast of Scottsdale (QM S60755).

Diagnosis.—Male and female *H. globosa* can be distinguished from all other known congeners by the triangular shape of the carapace in lateral view (with highest point of pars cephalica separated from PME by distance greater than medial length of clypeus). Other autapomorphies include the single long, serrate, moveable hair near the base of each fang (Fig. 35), fangs with length greater than half length of paturon (Fig. 34), fangs without hooked tips (Fig. 35), a posteriorly-directed,



Figures 31–36.—*Holarchoaea globosa*, pedipalp and chelicerae: 31–33, Male left pedipalp; 31. Distal segments, retrolateral view; 32. Bulb and cymbium, retro-ventral view, showing pointed distal process of cymbium; 33. Cymbium, tibia and patella, retrolateral view, showing proximal, posteriorly directed, spine-like process of cymbium and complex tibia and patella. 34–36. Female chelicerae: 34. Chelicerae, frontal view, showing relative lengths of paturon and fang; 35. Fang, distal tooth and moveable hair of right chelicera, frontal view, showing distally curved fangs and morphology of serrate moveable hair; 36. Fang, showing strongly serrated prolateral edge.

spine-like proximal apophysis on the male palpal cymbium (Fig. 33) and bilobed, distally and proximally spherical female receptacula (Fig. 30).

Without a cladistic analysis of the entire Australasian holarchaeid fauna, it is unclear whether the above autapomorphies are indicative of a highly derived species of *Holarchoaea* (congeneric with the New Zealand species *H. novaeseelandiae*), or of a monotypic Australian genus, sister to the former.

Description.—*Male* (QM S60756): Carapace 0.45 long, 0.40 wide. Abdomen 0.60 long, 0.55 wide. Total length 1.05. Color: carapace dark brown. Abdomen dark brown with lighter dotted striations anteriorly and anterolaterally. Legs uniform brown. Body and legs shiny black in life. Carapace (Fig. 29): in lateral view triangular; highest point of pars cephalica separated from PME by distance greater than medial length of clypeus. Clypeus swollen; triangular in dorsal view. Chelicerae:

elongate, constricted proximally, with single long, serrate, proximally-widened/flattened moveable hair projecting from near base of fang. Fang greater than half length of paturon; tip curved but not hooked; without poison gland opening. Dentition: 2 prolateral (true) teeth, widely spaced. Abdomen (Fig. 29): spherical, without surface sclerotization. Pedipalp (Figs. 31–33): patella large, wedge-shaped, with distal spurs. Tibia complex, twisted. Cymbium spoon-shaped, with prominent, posteriorly directed, spine-like apophysis proximally; retro-distally with broad, pointed apophysis. Ventral surface of bulb relatively smooth. Embolus coiled.

Female (QM S60756): Epigyne (Fig. 30): receptacula elongate, bilobed.

Distribution.—*Holarchoaea globosa* specimens are known from south-west, west, north-west, south-central and north-east Tasmania.

Remarks.—Adult specimens of *Holarchoaea globosa* have been collected at various

months of the year, including January, February, April, May and October.

General biology.—Very little is known about the biology of *H. globosa*. From the relatively few collection details available, it would appear that the species is restricted to wet and consistently humid habitats. Most specimens have been found on ferns or within moss and leaf litter in temperate rainforest (although several specimens have also been collected from caves: Main Cave near Montagu, Andrews River Caves and Cardia Cave near Acheron River, see Eberhard et al. 1991). Of these, the majority have not been observed alive (e.g., they were collected using tullgren extractions or pyrethrum fogging). However, I collected four *H. globosa* alive in January 2002: two from Hogarth Falls near Strahan (1 male & 1 female) and two from Cuckoo Falls near Scottsdale (1 juvenile & 1 female). All four specimens were collected from among the leaves of the 'hard water fern' (*Blechnum watsii*, Blechnaceae), an abundant, low-growing species within many Tasmanian rainforests (Garrett 1996). The former two were found close to midnight, during persistent rain, with the male seen hanging from a single line of silk between the fern leaves. The female was swept from vegetation nearby. The Cuckoo Falls female was beaten from ferns in tall beech (*Nothofagus*) and tree fern forest during overcast and humid conditions, whilst the juvenile was collected in the same manner, close to the waterfall. Interestingly, a male and female were also collected by Lisa Boutin (QVM) at Hogarth Falls four years earlier, again during persistent rain. The diet of *H. globosa* is unknown, although the organisms beaten from the *Blechnum* and tree ferns, oribatid mites, collembola and other spiders dominated.

Observations of live specimens.—Live *H. globosa* were maintained alive in captivity from 27 January until 11 February, 2002.

The *H. globosa* specimens I collected (see General Biology, above) were all shiny black in life (this appearance was rapidly lost after ethanol preservation), and superficially not unlike small theridiid spiders. Both sexes were agile when walking along a line of silk, but spent most of their time in captivity hanging or clinging upside-down. When lowered onto a horizontal surface the spiders would walk around until they found an object to assail,

then proceed upwards to find a suitable position for resuming an upside-down pose. While walking the spiders would regularly wave their first two pairs of legs around in the air, and when at rest would occasionally do the same (with leg I). In the upside-down resting position the legs were held close against the carapace and abdomen, and the elongate chelicerae were held vertically and flat against the anterior cephalothorax and endites (at an angle to each other, to form a triangle in anterior view). While the chelicerae of many holarchaeid specimens (in ethanol) point at an angle to the cephalothorax (due to relaxation of the cheliceral muscles during preservation), those of the live spiders were not seen to extend to such a degree, and the only cheliceral movement observed was of strictly diaxial form (when the spiders 'cleaned' their legs with their mouthparts).

INTERRELATIONSHIPS OF THE AUSTRALIAN TAXA

Species-group relationships are hypothesized and outlined below for the eight described Australian pararchaeid species. Without a full revision and cladistic analysis of the family, it is unclear whether the groups as here delimited represent separate monophyletic genera, or merely clusters of similar species united by substantial homoplasy. However, multiple somatic and correlated genitalic similarities clearly exist between groups of Australian species of *Pararchaea*, and the majority of species examined by the author, including those currently undescribed from the Australian mainland, can be attributed to one of the four putatively monophyletic clades as here diagnosed.

Pararchaea saxicola species group

Diagnosis.—United by: femur of leg I with proximal retrolateral denticles; male abdomen with small to very small dorsal scute (separate or fused to anterior sclerite), not surrounding or extending posterior to level of DSP2; male pedipalp with relatively short, inwardly hooked paracymbium, and without brush of hairs in groove along retrolateral edge of cymbium.

Distribution.—Known from north-eastern Queensland, south-eastern Queensland, north-eastern New South Wales, Tasmania and south-western Western Australia.

Included species.—*Pararchaea ornata* Hickman, *P. saxicola* Hickman, and several unnamed species.

Pararchaea lulu species group

Diagnosis.—United by: femur of leg I with proximal retrolateral denticles; male abdomen with small to medium-sized, pale dorsal scute (often longitudinally elongate), usually extending posterior to level of DSP2; male pedipalp with brush of hairs in groove along retrolateral edge of cymbium and distally expanded, bifurcate embolus.

Distribution.—Known from north-eastern, middle-eastern and south-eastern Queensland, eastern New South Wales, Victoria and Tasmania.

Included species.—*Pararchaea lulu* new species, *P. hickmani* new species and several unnamed species.

Pararchaea corticola species group

Diagnosis.—United by: femur of leg I with proximal retrolateral denticles; male abdomen with large, broad, dark brown dorsal scute, surrounding and extending posterior to level of DSP2; male pedipalp with prominent distal extension of distal plate into pointed ‘conductor’, without brush of hairs in groove along retrolateral edge of cymbium.

Distribution.—Known from south-eastern Queensland, eastern New South Wales, Victoria and Tasmania.

Included species.—*Pararchaea binnaburra* Forster, *P. corticola* Hickman, *P. robusta* new species and several unnamed species.

Pararchaea bryophila species group

Diagnosis.—United by: femur of leg I without proximal retrolateral denticles; postero-dorsal aspect of male pars-cephalica with medial indentation; male anterior tarsus distinctly swollen proximally; male abdomen with large, broad dorsal scute, extending posterior to level of DSP2; male pedipalp without brush of hairs in groove along retrolateral edge of cymbium; female receptacula together forming distinctive, posteriorly convergent ‘V-shape’, with ‘nose-like’ inward lobes.

Distribution.—Known from south-eastern Queensland, eastern New South Wales, Victoria and Tasmania.

Included species.—*Pararchaea bryophila* Hickman, and several unnamed species.

ACKNOWLEDGMENTS

This paper would not have been possible without the support and assistance provided by a number of people. To Lisa Boutin of the Queen Victoria Museum (Launceston), I am particularly grateful for the extended help and hospitality given to me during field work in Tasmania, for the prompt delivery of loan material and for the organization of the collecting permit. To Graham Milledge and Mike Gray (both of the Australian Museum, Sydney) and Robert Raven (of the Queensland Museum, Brisbane), for their extensive help in organizing loans and accessing museum collections and facilities. Also to Mike Gray for his assistance in digitally photographing epigynes and type specimens and to Robert Raven for use of the scanning electron microscopy facilities at the Queensland Museum. The Tasmanian Parks and Wildlife Service provided assistance in obtaining a collecting permit (Permit Number FA 01270). Thanks are also due to Robert Raven, who made helpful comments on an earlier draft of the manuscript.

LITERATURE CITED

- Eberhard, S.M., A.M.M. Richardson & R. Swain. 1991. The Invertebrate Cave Fauna of Tasmania. University of Tasmania Zoology Department, Hobart.
- Forster, R.R. 1949. New Zealand spiders of the family Archaeidae. Records of the Canterbury Museum 5:193–203.
- Forster, R.R. 1955. Spiders of the family Archaeidae from Australia and New Zealand. Transactions of the Royal Society of New Zealand 83: 391–403.
- Forster, R.R. & N.I. Platnick. 1984. A review of the archaeid spiders and their relatives, with notes on the limits of the superfamily Palpimanoidea (Arachnida, Araneae). Bulletin of the American Museum of Natural History 178:1–106.
- Garrett, M. 1996. The ferns of Tasmania: their ecology and distribution. Tasmanian Forest Research Council, Hobart.
- Hickman, V.V. 1969. New species of Toxopidae and Archaeidae (Araneida). Papers and Proceedings of the Royal Society of Tasmania 103:1–11.
- Hickman, V.V. 1981. New Tasmanian spiders of the families Archaeidae, Cycloctenidae, Amaurobiidae and Micropholcommatidae. Papers and Proceedings of the Royal Society of Tasmania 115: 47–68.
- Koch, C.L. & G.C. Berendt. 1854. Die im Bernstein

- befindlichen Crustaceen, Myriapoden, Arachniden und Apteren der Vorwelt. Edwin Groening, Berlin.
- Schütt, K. 2000. The limits of the Araneoidea (Arachnida: Araneae). *Australian Journal of Zoology* 48:135–153.
- Wilton, C.L. 1946. A new spider of the family Archaeidae from New Zealand. *Dominion Museum Records in Entomology* 1:19–26.
- Manuscript received 9 September 2003, revised 9 December 2003.*