

**GRYMEUS, A NEW GENUS OF POUCHED OONOPID SPIDER
FROM AUSTRALIA (CHELICERATA: ARANEAE)**

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Abstract

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A new genus, *Grymeus*, is described for three new species, *G. robertsi* (type species) and *G. yanga*, from western Victoria and south-western New South Wales, and *G. barbatus* from central South Australia. It is unusual due to the presence of extensive, setaceous book-lung covers and a male pouch formed by the modification of the maxillae, labium and sternum. The genus is compared with other pouched oonopids from South America.

Introduction

Only four species of oonopid spiders have been previously described in which males are known to possess modified maxillae, labia and sterna forming a cavity to protect the distal portions of the palp: *Gamasomorpha wasmanniae* Mello-Leitão, *G. patquiana* Birabén, *Marsupopaea sturmi* Cooke and *M. cupida* (Keyserling). All are from South America. Recent field work in the semi-arid regions of Australia has uncovered three further species with similar modifications which are described below.

Specimens are lodged in the Museum of Victoria, Melbourne (NMV), the Australian National Insect Collection, Canberra (ANIC) and the South Australian Museum, Adelaide (SAM). Most terminology follows Forster (1967) and the terminology of the female genitalia follows Forster and Platnick (1985). All measurements are taken to the nearest 0.005 mm. Two specimens of *Grymeus robertsi* were air-dried and gold-coated for examination in a JEOL JSM-35C Scanning Electron Microscope. The respiratory system and female genitalia were examined by separating the abdomen from the cephalothorax and removing the dorsal abdominal plate. The ventral portion of the abdomen was then cleared by heating in 10% potassium hydroxide.

Oonopidae

***Grymeus* gen. nov.**

Type species. Grymeus robertsi sp. nov.

Diagnosis. *Grymeus* differs from all other known oonopid genera by the possession of setaceous book-lung covers (Fig. 9), stout, blunt, carinate setae (Fig. 10), and the distal patch of curved setae on the male palpal cymbium (Figs. 5, 15, 20). Males further differ by the combined presence of a pouch (Fig. 7) and the absence of porrect cheliceral setae (Figs. 2, 7, 12, 18).

Description. Colour dark red-brown. Carapace, abdomen, palps and legs with stout, blunt, carinate setae (Fig. 10); sternum with thinner setae. Carapace (Figs. 1-2, 11-12, 17-18) pear-shaped in dorsal view; clypeus with several stout, forwardly projecting setae. Six eyes; from above, posterior eye row slightly recurved; PME largest. Chelicera without teeth; with lamella; fang without proximal lobe. Maxillae convergent, nearly touching in midline (Fig. 7); labium rounded anteriorly (Fig. 7); maxillae and labium of male depressed, which together with anterior invagination of sternum form a pouch receiving terminal elements of palp (Fig. 7); sternum posteriorly rounded (Figs. 3-4, 13-14, 19); carapace and sternum joined by chitinous inter-coxal strips. Male palp (Figs. 5, 15, 20-21) with embolus and conductor gently curved, lying nearly at right angles to cymbium and in pouch (Fig. 7); cymbium with distal patch of curved setae; conductor lying beneath embolus; embolus apically divided into 2 separate flanges; tibia with 2 serrate trichobothria. Female palp without claw;

tibia with 2-3 serrate trichobothria. Leg formula 4123; legs relatively stout, without spines; tibiae with 1 sub-basal and 2 medial serrate trichobothria and metatarsi with 1 distal serrate trichobothrium; tarsal organ near distal end of tarsi, structure as in Fig. 8; onychium present, each bearing 2 doubly pectinate claws and 2 large and several smaller spatulate hairs. Abdomen with extensive dorsal and ventral plates (Figs. 1-4, 11-14, 17-19), the former generally overlapping the latter; female ventral plate divided into 2 by epigastric furrow which extends to lateral margins of ventral plate; male epigastric furrow not extending to lateral margins of ventral plate. Male genital aperture situated slightly anterior of epigastric furrow, genitalia not studied. Female genitalia (Figs 6, 16) with thick transverse muscle plate from which arises an anterior spherical lobe and a distally broadened anterior receptaculum, and a large, thin-walled posterior receptaculum; secretory gland not apparent; *G. yanga* also possesses a pair of cuticular patches fused to internal surface of abdominal wall (Fig. 16). Book-lung covers consisting of reticulated, matted setae that arise from setal bases (Fig. 9); covers nearly touching in midline above petiole; tracheal openings situated within tracheal slit situated behind epigastric furrow, tracheae extending into prosoma. Six spinnerets surrounded by a circular scute plus dorsal semi-circular scute; sclerotized colulus present, with 2 setae.

Etymology. The generic name is from the Greek *grymea* (bag) and refers to the pouch of the male (masculine).

Remarks. *Grymeus* resembles *Gamasomorpha*

Karsch and related genera, but differs most notably by the presence of (a) setaceous book-lung covers, (b) stout, blunt, carinate setae on most of the body, and (c) the male pouch. Brignoli (1974) noted that the palp of *Gamasomorpha cataphracta* Karsch, the type species, rests on a small ledge of the sternum, and I have examined several similar Australian species. Even though

this ledge may be considered a precursor of the pouch and hence limiting the value of the pouch as a generic character, none of these species possess the unusual book-lung covers characteristic of *Grymeus*. These covers are apparently unique within the Araneae, and a detailed study of their structure may prove to be of extreme interest.

Species of *Grymeus* most closely resemble two South American species, *Ga. wasmanniae* and *Ga. patquiana*, males of which possess a pouch but lack the setaceous book-lung covers and stout setae (Birabén, 1954). Males of these two species further differ by the presence of porrect cheliceral setae (Birabén, 1954). To fully reflect the apparent sister-group relationship of *Grymeus* and the two South American species, the latter probably deserve to be removed from *Gamasomorpha* to a new genus.

The only other described oonopids with a male pouch are the two Colombian species of the genus *Marsupopaea* Cooke, *M. sturmi* (male holotype in the American Museum of Natural History, New York, examined) and *M. cupida*. *Marsupopaea* appears to be unrelated to *Grymeus* or the two *Gamasomorpha* species mentioned above and is more closely related to species of *Opopaea* Simon due to similarities of the male palp (Cooke, 1972).

Key to species of *Grymeus*

1. Males 2
 - Females (those of *G. barbatus* not known) 4
2. Carapace with 2 or 3 longitudinal dorsal rows of stout setae (Figs. 11-12); small patch of tubercles present above petiole *G. yanga*
 - Carapace without longitudinal dorsal rows of stout, long setae (Figs. 1-2); patch of tubercles not present above petiole 3
3. Setae anterior to genital operculum very long and curved (Fig. 19); genital operculum situated in middle of abdomen (Fig. 19) *G. barbatus*
 - Setae anterior to genital operculum short and virtually straight (Fig. 3); genital operculum situated in anterior third of abdomen (Fig. 3) *G. robertsi*

4. Carapace with 2 or 3 longitudinal dorsal rows of stout setae (Figs. 11-12); small patch of tubercles present above petiole; female genitalia with paired cuticular patches fused to internal abdominal wall (Fig. 16).....*G. yanga*
 - Carapace without longitudinal dorsal rows of stout, long setae (Figs. 1-2); patch of tubercles not present above petiole; female genitalia without paired cuticular patches fused to internal abdominal wall (Fig. 6)*G. robertsi*

***Grymeus robertsi* sp. nov.**

Figures 1-10

Type material. Holotype: Victoria, Horseshoe Bend, Little Desert National Park (36°32.5'S, 142°01'E), under bark of *Eucalyptus camaldulensis*, M.S. Harvey and B.E. Roberts, 6 Jul 1982, NMV K209 (♂).

Paratypes: Victoria. Same data as holotype, NMV K210-222 (5 ♂♂, 8 ♀♀); ANIC (2 ♂♂, 2 ♀♀: 1 ♂, 1 ♀ gold-coated for SEM). 4 km S of Horseshoe Bend, Little Desert National Park, ex leaf litter of *Astroloma conostephioides*, M.S. Harvey and B.E. Roberts, 6 Jul 1982, NMV K223 (1 ♂). Mt Arapiles (36°45'S, 141°50'E), 365 m, ex leaf litter of *E. goniocalyx*, M.S. Harvey and D.C.F. Rentz, 27 Oct 1983, ANIC, Berlesate No. 898 (1 ♂). 15 km WNW of Yaapeet, Lake Albacutya Park, under bark of *E. camaldulensis*, M.S. Harvey and B.E. Roberts, 4 Jul 1982, NMV K224 (1 ♀).

Diagnosis. Carapace without longitudinal rows of long, stout, dorsal setae (Fig. 2). Small patch of tubercles above petiole lacking. Females lack paired cuticular patches fused to the internal abdominal wall anterior to genitalia and possess relatively smooth lateral margins of the muscle attachment plate (Fig. 6). Setae anterior to genital operculum not particularly elongate and only slightly curved (Figs. 3-4).

Description. Male: Total length 1.82-1.90. Carapace (Figs. 1-2) 0.77-0.80 long, 0.53-0.57 wide, 0.30-0.33 high, without longitudinal rows of stout, dorsal setae. Eye sizes of holotype: ALE 0.06, PME 0.07, PLE 0.05. Palp as in Fig. 5. Leg and palp measurements of holotype: leg I: femur 0.395, patella 0.19, tibia 0.295, metatarsus 0.21, tarsus 0.165, total 1.255; leg II: femur 0.355, patella 0.21, tibia 0.275, metatarsus 0.20, tarsus 0.14, total 1.18; leg III: femur 0.335, patella 0.17, tibia 0.25, metatarsus 0.185, tarsus 0.15, total 1.09; leg IV: femur 0.42, patella 0.22, tibia 0.325, metatarsus 0.22, tarsus 0.205, total 1.39; palp: femur 0.15, patella 0.08, tibia 0.09, tarsus 0.23, total 0.55. Abdomen (Figs. 1-3) 1.08-1.20 long, 0.70-0.77 wide. Genital operculum situated in anterior third of abdomen. Setae anterior to geni-

tal operculum not particularly elongate and only slightly curved.

Female: Total length 1.89-2.02. Carapace 0.71-0.77 long, 0.51-0.56 wide, 0.27-0.33 high. Eye sizes of K217: AME 0.05, PME 0.06, PLE 0.05. Leg and palp measurements of K219: leg I: femur 0.405, patella 0.225, tibia 0.25, metatarsus 0.20, tarsus 0.17, total 1.25; leg II: femur 0.35, patella 0.205, tibia 0.24, metatarsus 0.20, tarsus 0.155, total 1.15; leg III: femur 0.355, patella 0.18, tibia 0.235, metatarsus 0.19, tarsus 0.14, total 1.10; leg IV: femur 0.445, patella 0.23, tibia 0.31, metatarsus 0.255, tarsus 0.19, total 1.43; palp: femur 0.155, patella 0.105, tibia 0.07, tarsus 0.18, total 0.51. Abdomen (Fig. 4) 1.21-1.39 long, 0.77-0.81 wide. Genital operculum situated in anterior third of abdomen. Setae anterior to genital operculum not particularly elongate and only slightly curved. Genitalia (Fig. 6): lateral margins of muscle attachment plate relatively smooth; without paired cuticular patches fused to internal abdominal wall.

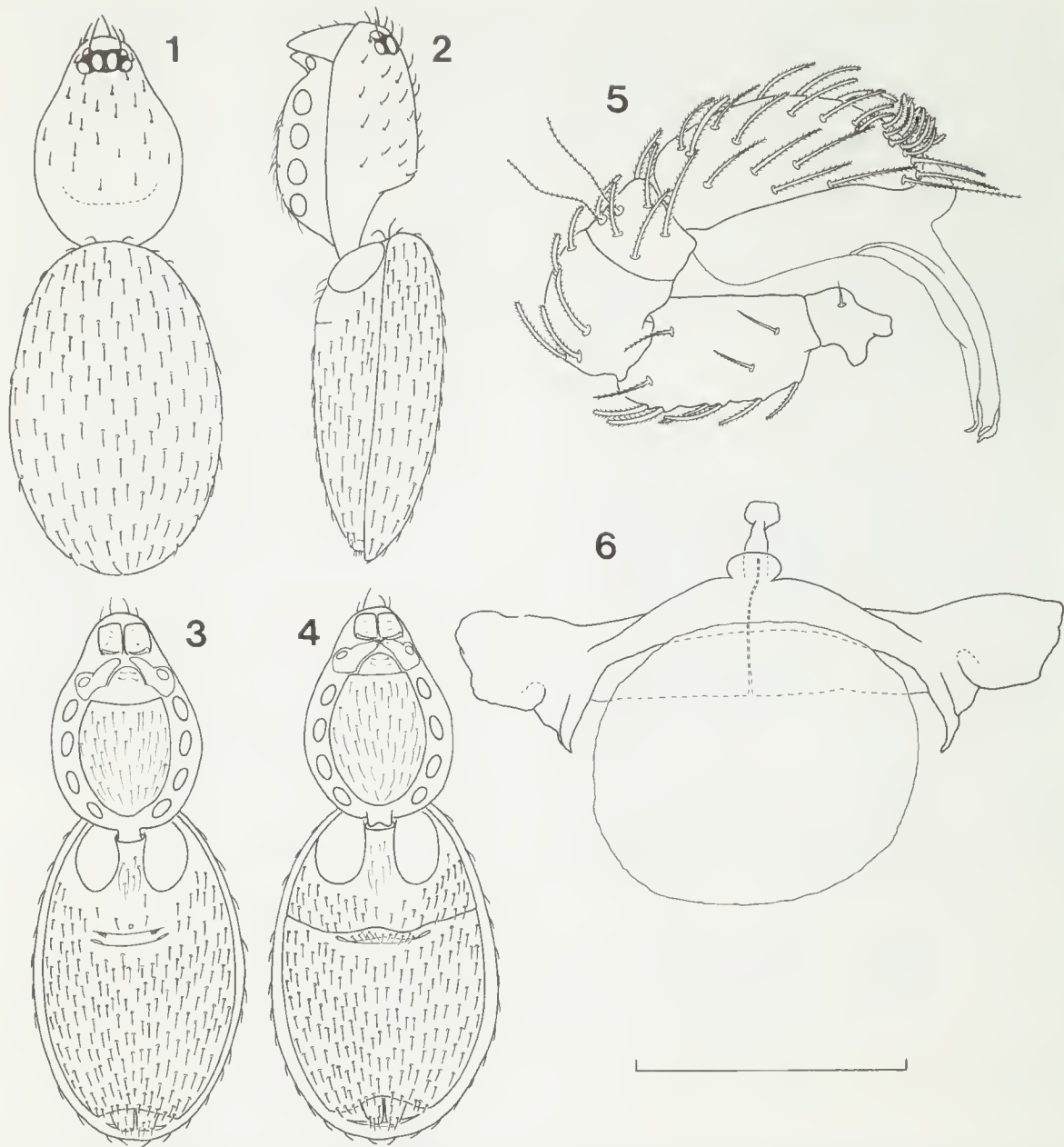
Etymology. This species is named for Bryan Roberts who assisted in the collection of most of the specimens.

Remarks. Although this species has been taken primarily under the bark of trees, two specimens have been collected from leaf litter. A single mating sequence was observed to take place under a sheet of *Eucalyptus camaldulensis* bark at Horseshoe Bend during October 1983 (the specimens were not collected). The male was positioned under the female and both were facing in the same direction with their ventral surfaces in contact. This corresponds to mating position III of Kaston (1948). No web was present.

***Grymeus yanga* sp. nov.**

Figures 11-16

Type material. Holotype: Victoria, 5 km W of Mildura (34°10'S, 142°06'E), under bark of *Eucalyptus camaldulensis*, M.S. Harvey, B.J. Scott and L.A. Hoare, 21 Sep 1985, NMV K344 (♂).



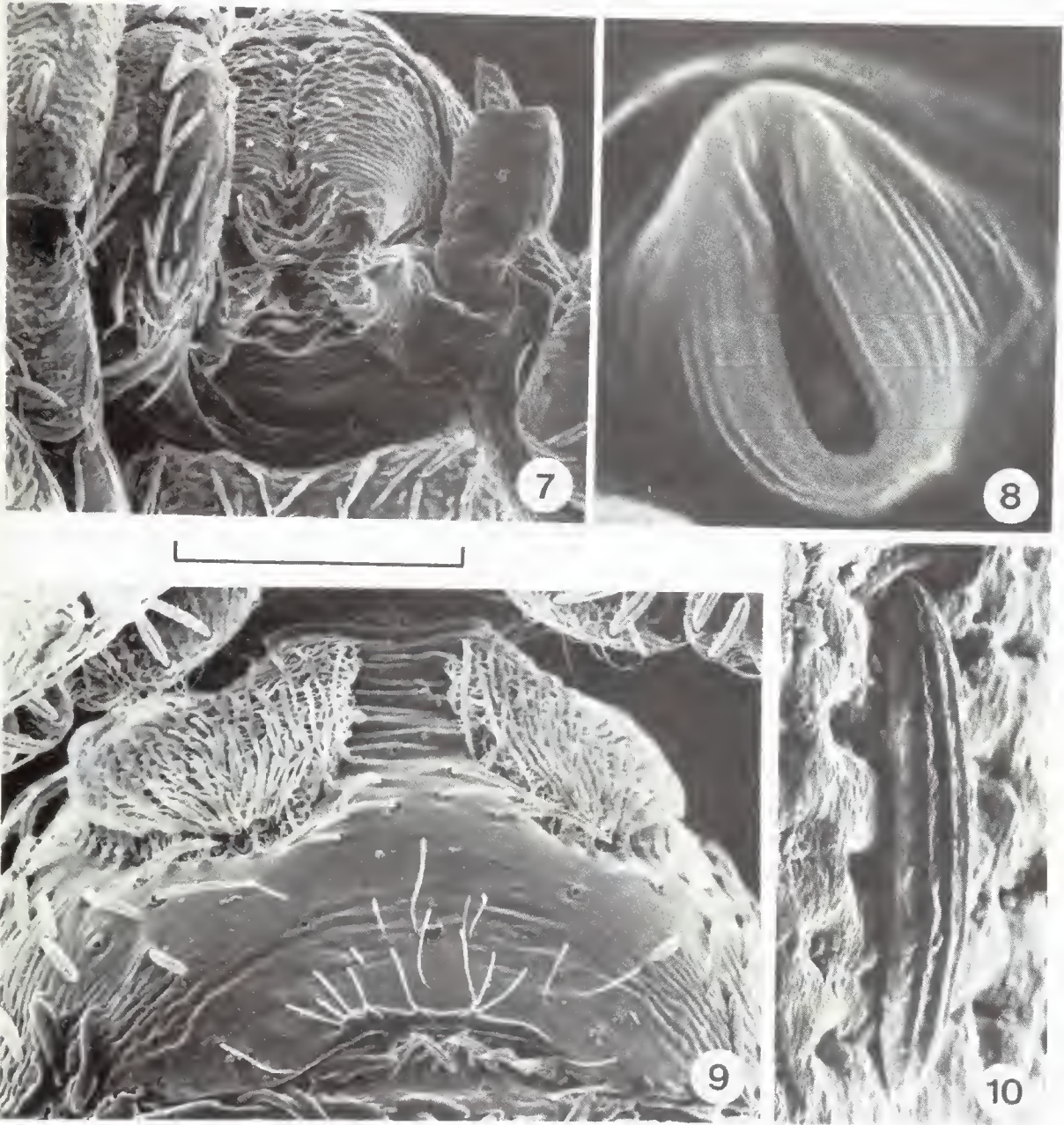
Figures 1-6. *Grymeus robertsi* sp. nov. Holotype male: Fig. 1, dorsal view. Fig. 2, lateral view. Fig. 3, ventral view. Paratype female, K219: Fig. 4, ventral view. Holotype male: Fig. 5, left palp, lateral view. Paratype female, K222: Fig. 6, genitalia, dorsal view. Scale line = 1.00 mm (Figs. 1-4), 0.24 mm (Fig. 5), 0.16 mm (Fig. 6).

Paratypes: Victoria. Same data as holotype, NMV K345-353 (4 ♂♂, 5 ♀♀).

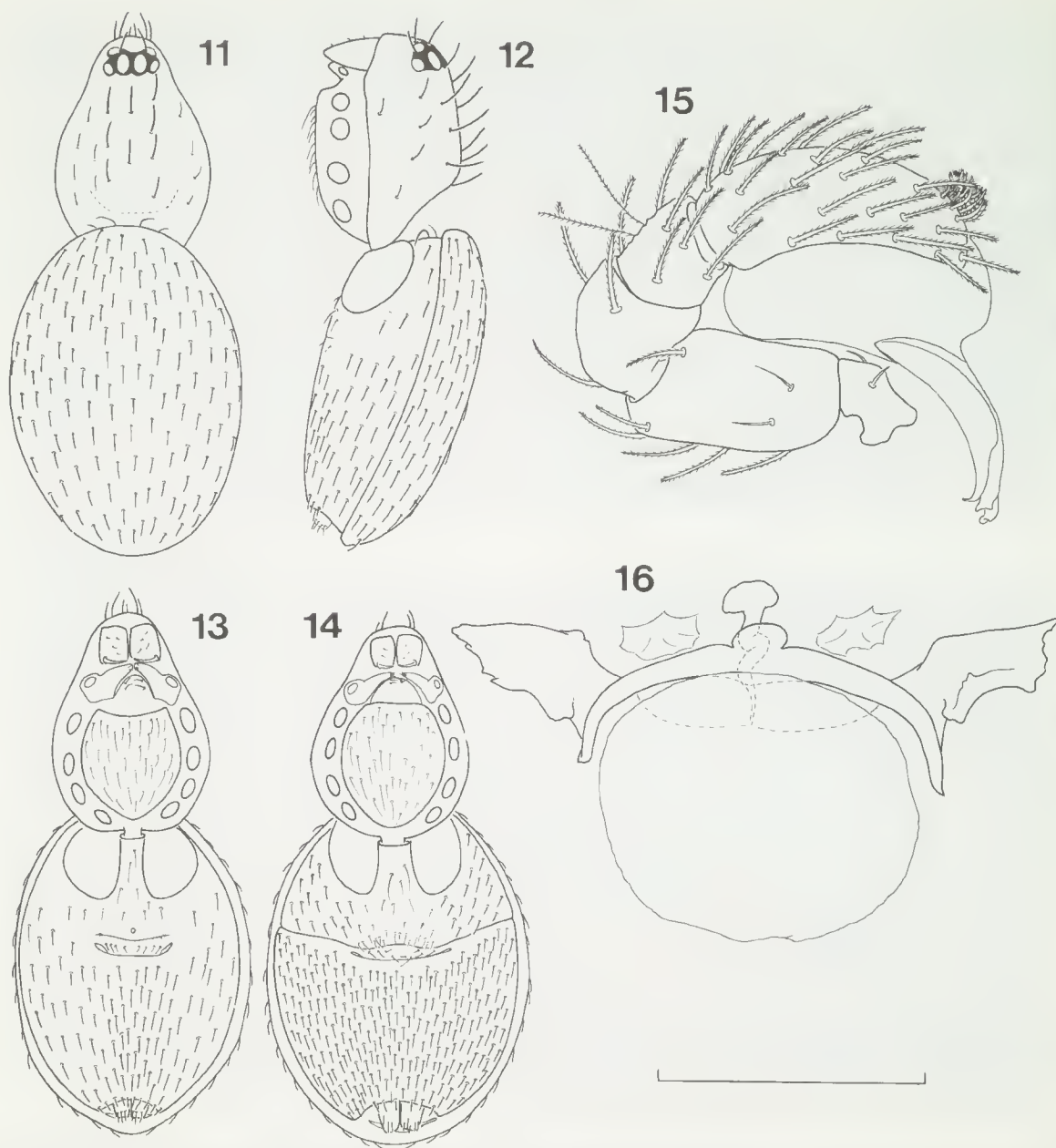
New South Wales, Yanga Lake (34°42'S, 143°35'E), under bark of *E. camaldulensis*, D.C.E. Rentz and M. S. Harvey, 24 Oct 1983, ANIC (1 ♀).

Diagnosis. Carapace with 2 or 3 longitudinal rows

of long, stout, setae (Figs. 11-12). Small patch of tubercles present above petiole. Females possess paired cuticular patches fused to internal abdominal wall anterior to genitalia and rough lateral margins to muscle attachment plate (Fig. 16).



Figures 7-10. Scanning electron micrographs of *Grymeus robertsi* sp. nov. Paratype male: Fig. 7, mouthparts and pouch, ventral view. Fig. 8, tarsal organ from leg II. Paratype female: Fig. 9, anterior portion of abdomen, ventral view. Paratype male: Fig. 10, seta from dorsal abdominal plate. Scale line = 0.10 mm (Figs. 7, 9), 0.005 mm (Fig. 8), 0.04 mm (Fig. 10).



Figures 11-16. *Grymeus yanga* sp. nov. Holotype male: Fig. 11, dorsal view. Fig. 12, lateral view. Fig. 13, ventral view. Paratype female, K349: Fig. 14, ventral view. Holotype male: Fig. 15, left palp, lateral view. Paratype female: Fig. 16, genitalia, dorsal view. Scale line = 1.00 mm (Figs. 11-14), 0.24 mm (Fig. 15), 0.16 mm (Fig. 16).

Setae anterior to genital operculum not particularly elongate and only slightly curved (Figs 13-14).

Description. Male: Total length 1.63-1.86. Cara-

pace (Figs. 11-12) 0.67-0.81 long, 0.555-0.605 wide, 0.315-0.35 high; with several rows of stout, slightly curved setae (Figs. 11-12). Eye sizes of holotype: ALE 0.055, PME 0.06, PLE 0.05. Palp as in Fig. 15. Leg and palp measurements of

holotype: leg I: femur 0.495, patella 0.24, tibia 0.305, metatarsus 0.29, tarsus 0.205, total 1.535; leg II: femur 0.435, patella 0.23, tibia 0.285, metatarsus 0.26, tarsus 0.205, total 1.415; leg III: femur 0.425, patella 0.205, tibia 0.265, metatarsus 0.255, tarsus 0.18, total 1.33; leg IV: femur 0.54, patella 0.295, tibia 0.385, metatarsus 0.345, tarsus 0.20, total 1.765; palp: femur 0.20, patella 0.115, tibia 0.085, tarsus 0.26, total 0.66. Abdomen (Figs. 11-13) 1.00-1.19 long, 0.725-0.85 wide. Genital operculum situated in anterior third of abdomen. Setae anterior to genital operculum not particularly elongate and only slightly curved. Small patch of tubercles present above petiole, possibly acting as stridulatory file, with the posterior margin of carapace acting as pick.

Female: Total length 1.80-2.00. Carapace 0.685-0.785 long, 0.575-0.59 wide, 0.295-0.35 high. Eye sizes of specimen from Yanga Creek: ALE 0.07, PME 0.06, PLE 0.04. Leg and palp measurements of specimen from Yanga Creek: leg I: femur 0.47, patella 0.25, tibia 0.325, metatarsus 0.29, tarsus 0.215, total 1.55; leg II: femur 0.44, patella 0.245, tibia 0.305, metatarsus 0.265, tarsus 0.23, total 1.485; leg III: femur 0.38, patella 0.22, tibia 0.29, metatarsus 0.27, tarsus 0.21, total 1.37; leg IV: femur 0.545, patella 0.295, tibia 0.395, metatarsus 0.335, tarsus 0.25, total 1.82; palp: femur 0.225, patella 0.075, tibia 0.09, tarsus 0.215, total 0.605. Abdomen (Fig. 14) 1.225-1.27 long, 0.88-0.98 wide. Genital operculum situated in anterior third of abdomen. Setae anterior to genital operculum not particularly elongate and only slightly curved. Small patch of tubercles present above petiole, as in male. Genitalia (Fig. 16): lateral margins of muscle attachment plate rough; paired cuticular patches fused to internal abdominal wall.

Etymology. The specific epithet is a noun in apposition taken from one of the collection sites.

Grymeus barbatus sp. nov.

Figures 17-21

Type material. Holotype: South Australia, 25 km SSW of Mabel Creek Homestead (29°10'S, 134°15'30"E), pitfall, stony tableland, CRA Survey, 28 Oct 1984, SAM N1986266 (♂).

Diagnosis (male only). Carapace without longitu-

dinal rows of long, stout, dorsal setae (Fig. 18). Small patch of tubercles above petiole lacking. Setae anterior to genital operculum very long and curved (Fig. 19).

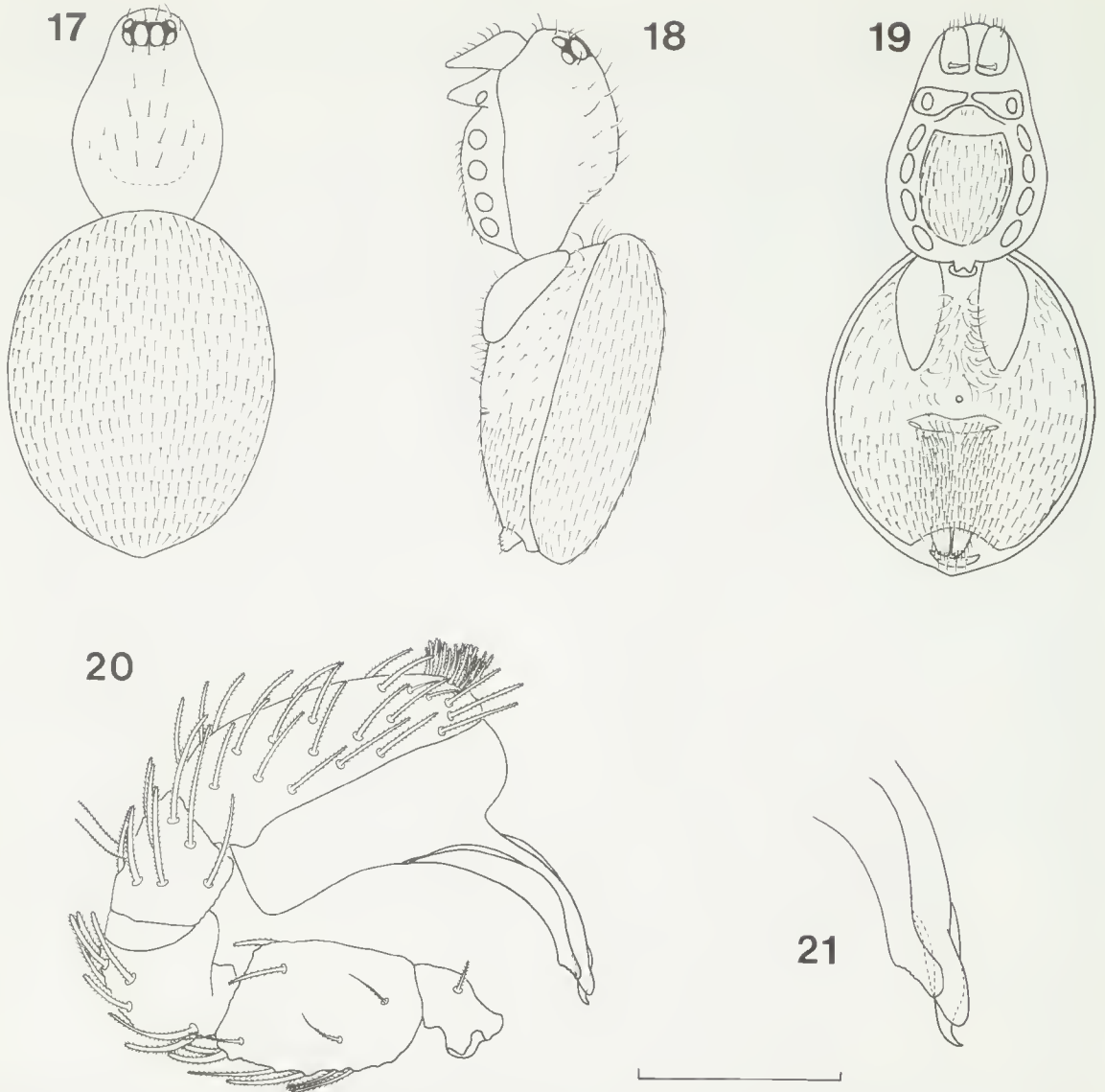
Description. Male: Total length 2.70. Carapace (Figs. 17-18) 1.10 long, 0.76 wide, 0.425 high, without longitudinal rows of stout, dorsal setae. Eye sizes of holotype: ALE 0.07, PME 0.11, PLE 0.06. Palp (Figs. 20, 21): conductor slightly dilated distally, with crenulate distal edge; one embolar flange hooked (Fig. 21). Leg and palp measurements of holotype: leg I: femur 0.675, patella 0.36, tibia 0.39, metatarsus 0.365, tarsus 0.21, total 2.00; leg II: femur 0.65, patella 0.34, tibia 0.38, metatarsus 0.36, tarsus 0.19, total 1.92; leg III: absent; leg IV: femur 0.765, patella 0.405, tibia 0.515, metatarsus 0.41, tarsus 0.245, total 2.34; palp: femur 0.25, patella 0.18, tibia 0.145, tarsus 0.38, total 0.955. Abdomen (Figs. 17-19) 1.70 long, 1.32 wide. Genital operculum situated in middle of abdomen (Fig. 19). Setae anterior to genital operculum very long and curved.

Etymology. From the Latin *barbatus* (bearded) referring to the long, curved setae anterior to the genital operculum.

Remarks. This is the largest species of the genus currently known. The holotype is not in perfect condition: the terminal segments of some legs are missing or damaged and both third legs are absent.

Acknowledgements

I wish to thank Dr N.I. Platnick (American Museum of Natural History, New York), Mr D.C. Lee and Mr D.B. Hirst (SAM) for the loan of material, the National Parks Service of Victoria for permission to collect in areas under their control, the Australian Biological Resources Study for funds, the Division of Entomology, CSIRO, for research facilities, K.A. Pickerd and C.D. Beaton for the scanning electron micrographs, those colleagues who either collected or assisted in the collection of specimens, M.R. Gray, B.Y. Main, R.J. Raven and especially R.J. Moran for helpful discussions, and R.J. Moran and R.B. Halliday for reviewing the manuscript.



Figures 17-21. *Grymeus barbatus* sp. nov., holotype male: Fig. 17, dorsal view. Fig. 18, lateral view. Fig. 19, ventral view. Fig. 20, left palp. Fig. 21, detail of embolus and conductor of left palp. Scale line = 1.00 mm (Figs. 17-19), 0.24 mm (Fig. 20), 0.12 mm (Fig. 21).

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