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First description of a mysmenid spider species from mainland Australia and new data for *Mysmena tasmaniae* Hickman, 1979 (Araneae, Mysmenidae)

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ABSTRACT

We describe a new species of the spider family Mysmenidae, *Mysmena leichhardti* sp. nov., and provide detailed additional morphological and behavioral information of *M. tasmaniae*. *M. tasmaniae* is known to occur and has been collected exclusively in Tasmania. In contrast, we have recently collected several specimens of *M. leichhardti* sp. nov. from Queensland, therefore representing the first formal description of a mysmenid species from mainland Australia. □ *taxonomy, spiders, Orbiculariae, web, Araneomorphae, Arachnida.*

Mysmenids are small araneoid spiders occurring worldwide, which remain poorly studied from all aspects mostly due to their small size and cryptic habits. The family recently benefited from the first comprehensive phylogenetic study (Lopardo *et al.* 2011), where its monophyly has been robustly tested with a combined phylogenetic analysis of morphological and molecular data (but see Dimitrov *et al.* 2012 for a comprehensive orbicularian analysis and the problematic monophyly of mysmenids and other symphytogaethoids). Currently, a modern comparative phylogenetic morphological revision is in the process of submission (Lopardo & Hormiga in prep.; refer to Lopardo 2009). Traditionally, the diagnosis of *Mysmena* Simon, 1894 has been rather confusing and inaccurate, particularly due to a mislabeling of the vial containing the

type specimen of *Mysmena leucoplagiata* (Simon, 1879) (see Lopardo 2009). Although not formally recircumscribed, a redefined “*Mysmena*” has been suggested based on the proposed phylogenetic hypothesis of the aforementioned comprehensive phylogenetic study (Lopardo *et al.* 2011: fig. 12). *Mysmena* can be recognised by the general conformation of the male palp and the trajectory of its spermatic duct and by a few features related to the female genitalia (e.g., ventral scapus and weak but sclerotized fertilization ducts). The taxonomic diversity of mysmenids is seriously under-studied. This is especially true for Australia where only one species of mysmenid has been described so far, *M. tasmaniae* Hickman, 1979, but in recent collecting efforts within the mainland and Tasmania, numerous undescribed mysmenid specimens have been discovered.

In this study we describe *Mysmena leichhardtii* sp. nov. from Queensland, which represents the first mysmenid species ever described from mainland Australia. Furthermore, we provide additional details on the genitalic morphology, respiratory arrangement, spinneret spigot conformation and web architecture of *M. tasmaniae*.

MATERIAL AND METHODS

Specimens were studied using standard morphological techniques in arachnology and following Lopardo (2009). Specimens were initially examined in 80% ethanol using a Leica MZAPO or a Leica MZ16A stereomicroscope. Further detailed observations and illustrations were performed using a Leica DMRM compound microscope with a drawing tube. All measurements are in millimeters. Left structures (mostly male palps) are depicted unless otherwise stated. If the right palp is used and/or illustrated, its image was reversed to facilitate comparisons and noted in the figure legend. Setae are not depicted in final palp and epigynum drawings. As a convention, relative position of sclerites in the male palp is stated as if the cymbium were dorsal, regardless of the relative position of the cymbium to the whole palp or to the prosoma. Observation of respiratory structures and female internal genitalia follows Álvarez-Padilla & Hormiga (2007). Abdomens were bisected horizontally and digested with SIGMA Pancreatin P1750 enzyme complex, in a solution of sodium borate prepared using the concentrations described by Dingerkus & Uhler (1977) as modified by Álvarez-Padilla & Hormiga (2007). Bisected abdomens were left in this solution at room temperature overnight or for a few hours. After the enzymatic digestion, abdomens were transferred to distilled water and then to ethanol. Digital images of spider habitus were taken with a Leica DFC 500 camera and extended focal plane images assembled using the software package Leica Application Suite. For scanning electron microscopy (SEM) observations and images, specimens were dissected and dried using an Autosamdri-815 (Tousimis®, Rockville, MD) critical-point drier. Specimen structures were then mounted on a

SEM rivet with adhesive copper conductive tape, secured (when large in size) with a fine thread of glue made of an acetone solution of polyvinyl resin (Álvarez-Padilla & Hormiga 2007), and then sputter-coated with gold-palladium using a Desk II LLC Cold Sputter Coater (Denton Vacuum U.S.A, Moorestown, NJ). Images were taken with a LEO 1430VP scanning microscope at the Department of Biological Sciences SEM facility of the George Washington University (Washington, D.C.). Observation of male palps and female epigyna was performed under clove oil. Nomenclature and homology statements of genital structures follow Lopardo (2009). Web architecture photographs were taken directly in the field; contrast was increased by dusting the webs with cornstarch (Carico 1977; Eberhard 1976). All drawings and images were edited, and plates assembled and labelled using Adobe Photoshop. A general diagnosis is provided for the two species treated in this study (as a combination of features that distinguish them from all other congeneric species), plus additional details to distinguish them from each other. Current diagnoses, as in any taxonomic treatment, might change with addition of species.

ABBREVIATIONS

AC	..... aciniform (gland spigot/s)
AG	..... aggregate (gland spigot/s)
C	..... .tegular (bulbal) conductor
CD	..... copulatory duct
Cyl	..... cylindrical (gland spigot/s)
CyC	..... cymbial conductor
CyFs	..... setae on cymbial fold
CyP	..... cymbial process
E	..... embolus
FD	..... fertilization duct
MAP	..... major ampullate (gland spigot)
mt	..... metatarsus
n	..... nubbin
PC	..... paracymbium
Pi	..... piriform (gland spigot/s)
S	..... spermatheca

ST	..... subtegulum
T	..... tegulum
t	..... tartipore
ta	..... tarsus
UE	..... uterus externus
AMS	..... Australian Museum, Sydney (Australia)
MCZ	..... Museum of Comparative Zoology (Cambridge, USA)
QM	..... Queensland Museum (Brisbane, Australia)
ZIMG	..... Zoologisches Institut und Museum Greifswald (Germany)

SYSTEMATICS

MYSMENIDAE Petrunkevitch, 1928

Mysmena Simon, 1894

***Mysmena leichhardti* sp. nov.**
(Figs 1A, 2A,B, 3A, 4–8)

Etymology.— The species is named after one of Australia’s greatest explorers and naturalist, the Prussian Friedrich Wilhelm Ludwig Leichhardt (1813–ca.1848), who contributed immensely to the knowledge of Australia’s fauna, flora and geology.

Materials examined. Holotype ♂, Paratype ♀, AUSTRALIA: Queensland: Atherton Plateau, Rose Gums Wilderness Retreat, waterfall trail, around waterfall, rainforest, S17°18’51.1” E145°42’08.6”, 770 m, 15-17.iii.2006, manual collecting, G. Hormiga, L. Lopardo (deposited in QM ♂, S95159, ♀, S96320). Paratypes: same data and locality as holotype (3♂ 3♀ paratypes deposited in MCZ; 2♂ 4♀ paratypes deposited in ZIMG). Additional labels on vials: GH 0154, LL-AU-13, ARAGH000063, LLS-062, sequenced: GenBank accession numbers: HM030413.1, HM030423.1, HM030433.1.

Other material examined. AUSTRALIA: Queensland: Atherton Plateau, Rose Gums Wilderness Retreat, waterfall trail, around waterfall, rainforest, S17°18’51.1” E145°42’08.6”, 770 m, 15-17.iii.2006, manual collecting, G. Hormiga, L. Lopardo, ♀ ♂ on same web, ♀ (web with square frame, photo voucher R4.25-27,30-32), ♀ (photo voucher R3.32-37, R4.1-6), ♀ (photo voucher R5.1-3), ♀ (photo voucher R4.26-27), ♀ (photo voucher R4.15-16), sub♂ (photo voucher R4.25-29). Rose Gums Wilderness Retreat, 12.4 km 059° ENE Malanda, rainforest, S17°18’51.1” E145°42’08.6”, 770 m, 15-16.iii.2006, manual collecting,

G. Hormiga, L. Lopardo, 2♂ 9♀ (all material will be deposited at MCZ).

Note I.— The male and female of this species are paired from a couple collected in the same web.

Note II.— *M. leichhardti* sp. nov. was included in the phylogenetic analyses of Lopardo *et al.* (2011) as “*Mysmena*-MYSM-017-AUST”, and its morphology and web architecture partially reported in the aforementioned study (see their figs 5a, 6e, 8c, 9d).

Diagnosis. *Mysmena leichhardti* sp. nov. can be distinguished from all other *Mysmena* species by the following combination of features: almost indistinct posterior bump on the globose abdomen in both male and female (Fig. 1A); carapace much higher in males than in females (Fig. 1A); male with sclerotized spot on femur I, female femoral spot on femora I and II; female with indistinct scapus, membranous copulatory ducts and C-shaped (i.e. not coiled) spermathecae (Figs 2A, 4A-C); male palp proportionally large with long and coiled embolus (Figs 5, 6), cymbium relatively simple including few modifications, like cymbial process, primary and secondary cymbial conductor, and a flap on the distal primary conductor area (Figs 5C,D, 6B). *M. leichhardti* sp. nov. is the first described species of *Mysmena* occurring in mainland Australia. In particular, general color appearance, size, habitat and web architecture are quite similar in both Australian *Mysmena* species (Figs 1, 3), but *M. leichhardti* sp. nov. can be distinguished from *M. tasmaniae* by the carapace dimorphism, the general conformation and the size difference of male and female genitalia, being *M. leichhardti* sp. nov. genitalia almost double in size (see Fig. 2).

Description. Male (Holotype S95159, Paratype): Total body length 0.68. Carapace elevated, length 0.34, width 0.37, height 0.32. Leg measurements (legs I and IV only; ti/mt/ta): I 0.28/0.22/0.26; IV 0.17/0.14/0.20. Femoral spot on leg I. One prolateral clasping spine located medially on metatarsus I (Figs 8D,E). Chelicerae not fused. Clypeus height approximately 3.5

AME diameter. Sternum scutiform, domed, length 0.25, width 0.24, length/width 1.04, posterior border truncated, about width of two coxae IV. Abdomen globose, with minute, almost indistinct bump posteriorly, length 0.45, width 0.39, height 0.38. **Macrosetae:** Macrosetae (relatively weak spines) long, slender, on distal dorsal patellae and proximal retrolateral tibia at least on legs I, II and IV. Distal half of tarsus I with row of prolateral, short, slender, distinct setae truncated at apex (unknown function, Figs 8D,F). Tarsal organ located proximally, capsulate, domed, with rounded orifice (Fig. 8C). Three tarsal claws, serrate accessory setae (false claws) present. Median tarsal claw on leg IV slender, elongate, sinuous (Figs 8A,B). Trichobothrial bases simple, smooth, proximal hood smooth, similar on all legs and segments. Tarsal trichobothria absent. **Trichobothria:** **I, II,** tibia 0-(2+r1)-0-0; metatarsus r1-0-0. **IV,** tibia p1-2-1-0; metatarsal trichobothria absent. Appendage cuticle squamate. **Color:** Carapace dark yellowish, ocular area darker, lateral borders black; sternum yellowish with two dark longitudinal bands. Mouthparts yellowish. Legs yellowish, distal tibiae and metatarsi darker. Abdomen dark with four posterior white spots forming an inverted-U in posterior view; white ventral ring surrounding spinnerets. Epiandrous spigots arranged in two bundles of seemingly two fusules each (Fig. 7A). **Eyes:** Eight eyes subequal. AME black, other eyes pearly white. Lateral eyes contiguous, PME separated less than one diameter, AME separated ~1.5 their diameter. **Respiratory system** (Figs 7A, B): Anterior spiracles connected to epigastric furrow. Anterior tracheal system restricted to the abdomen and internally interconnected by a transverse duct. Posterior tracheal system exteriorly with wide advanced tracheal spiracle, internal tracheal arrangement consisting of two bundles of branching lateral tracheae extending into the prosoma and two vestigial median apodemes. **Spinnerets** (Figs 4D-F, 7A): Spinneret field located ventrally on abdomen (as in Figs 1A, 7A). Colulus large, fleshy, triangular, about half length of ALS. Six spinnerets. Spigot conformation as follows: ALS MAP accompanied by nubbin and tartipore, Pi spigots with reduced base. PMS with two

AC, one posterior mAP accompanied only by tartipore, and (in females) one CY. PLS with two slim CY spigots (females), at least three AC, triad (FLA plus two AGs) present in both sexes, and anterior distinctly flat spatulate modified seta. Both AGs and FLA spigots similar in size. **Palp and copulatory bulb** (Figs 2B, 5, 6): Tibia broad distally, without apophyses, tibial rim with long aligned setae, except prolaterally. Palp large, almost as large as prosoma. Cymbium oriented ventrally on palp, so that bulb and embolus face dorsally (i.e. frontally in resting position). Cymbium with pointed tip and cymbial fold provided with short row of small setae (CyFs). Two apical furrows functioning as cymbial conductors (primary and secondary, CyC1 and CyC2, respectively), associated to embolus, running parallel to each other. CyC2 longer, on prolateral apical margin of cymbium. CyC1 with apical flap pointing retrolaterally. Cymbial groove absent. Small pointed cymbial process (CyP) located dorsally and apically. Paracymbium (PC) large, flat, medially located, with setae. Conductor (C) present, globose, concealing base of embolus, with groove hosting embolus. Exposed part of embolus long and coiled. Pars pendula present.

Female (Paratype S96320). As in male, except as noted. Total body length 0.80. Carapace not elevated, length 0.37, width 0.32, height 0.20. Leg measurements (legs I and IV only; ti/mt/ta): **I** 0.28/0.22/0.24; **IV** - /0.15/0.20. Femoral spot on legs I and II. Prolateral clasping spine absent. Palp without claw and comprising five segments. Sternum length 0.25, width 0.26 length/width 0.96, as in male. **Color:** as in male, two additional white abdominal spots dorsally. **Epigynum** (Figs 2A, 4A-C): Epigynal area not sclerotized, scapus indistinct. Copulatory openings not visible. Copulatory ducts (CD) membranous and widely convoluted, seeming to open from common membranous internal atrium. Spermathecae (S) sclerotized, C-shaped. Fertilization ducts (FD) distinguishable although weakly sclerotized, short.

Natural history. The specimens were manually collected from their webs in humid and hidden habitats such as in leaf litter or tree trunk

crevices. Both males and females, along with juveniles, spin the typical three-dimensional webs reported for other *Mysmena* and *Microdipoena* species (Fig. 3A). Web architecture seems quite plastic, as differences related to size, shape, and frame structure were observed, regardless of developmental stage or gender. The web reported for *M. tasmaniae* in Lopardo *et al.* (2011: fig. 5a) was a misidentification, it is actually from *M. leichhardti* sp. nov. (pers. obs.).

Distribution.— Known from Queensland, Australia.

***Mysmena tasmaniae* Hickman, 1979**
(Figs 1B, 2C,D, 3B, 9-10)

Mysmena tasmaniae Hickman 1979: 74-78, table 1, figs 39-47 (holotype male and allotype female from AUSTRALIA: Tasmania: Southwestern Tasmania: Maxwell River Valley, from leaf litter, 5.i.1978, L. Hill *et al.*; holotype: 145°55'E, 42°38'S (AMS-KS 2711), examined; allotype: 145°54'E, 42°38'S (AMS-KS 9625) examined). Davies 1985: 91 (transfer by Brignoli 1983 rejected). Lopardo *et al.* 2011: 286, figs 5a (misidentification), 6b.

Calodipoena tasmaniae Brignoli 1983: 376 (transfer from *Mysmena*).

Material examined. AUSTRALIA: Tasmania: SW Tasmania, 31.i.1977, L. Hill *et al.* ♂ (AMS KS 34486, SEM, genitalic drawing). Following material will be deposited in MCZ: Newall Creek, Franklin-Gordon Wild Rivers N.P., 9.57 km 177° S Queenstown, Nothofagus rainforest, S42°09'37.1" E145°32'20.1", 159m, 10.iii.2006, G. Hormiga, L. Lopardo, 2♂ ~10♀ (♀♀ SEM, ♂♀ multifocal image, ♀ genitalic drawing); ♀ (photo voucher GH.0473-76), ♀, Cradle Mountain-Lake St. Clair N.P., near Waldheim cabins, 22.6 km 202° SWS Moina, Nothofagus forest, S41°38'28.5" E145°56'26.5", 926 m, 5.iii.2006, M.J. Ramirez, sub♂ (ARAGH000062, GH0153, LL-AU-04, LLS-061, sequenced: GenBank accession numbers HM030414.1, HM030424.1, HM030434.1, HM030440.1). Lottah Road, 25.1 km 284° WNW St Helens, disturbed Nothofagus forest, S41°13'04.0" E147°59'06.2", 550 m, 7.iii.2006, G. Hormiga, L. Lopardo, 3♀ ♂ 13j, ♀♂. St Columba Falls, 27.1 km 256° W St Helens, eucalypt/casuarina woodland, S41°19'17.2" E147°55'33.7", 335m, 7.iii.2006, G. Hormiga, L. Lopardo, ♀ on tree ferns (photo voucher R3.5-6, 9-11 / 2), ♂ on tree ferns (photo voucher R3.5-8 / 1), 2♀ ♂ on tree ferns, ♀ 2 juv on moss layer on tree. Weldborough Pass Scenic Reserve, rainforest walk, 28.6 km 280° WNW St Helens, Nothofagus forest, S41°12'59.8" E147°56'18.2", 480 m, 6-7.iii.2006, G. Hormiga, L. Lopardo, 1 ♂.

Note I. The original description of *M. tasmaniae* by Hickman (1979) provides thorough information regarding not only general morphology but also detailed behavioral aspects

of this species, such as habitats, life cycle, copulation, and some web architecture. We therefore provide here some additional morphological aspects lacking in the original description, such as male and female genitalic structures, spinneret spigot conformation and respiratory arrangement.

Note II. *Mysmena tasmaniae* was included in the phylogenetic analyses of Lopardo *et al.* (2011), and its habitus partially reported (see their fig 6d; see comment above for the misidentification of fig. 5a).

Diagnosis. *Mysmena tasmaniae* can be distinguished from all other *Mysmena* species by the following combination of features: posterior bump on globose abdomen absent (Fig. 1B); carapace of similar height in both sexes (Fig. 1B); males and females with sclerotized femoral spot on femora I and II; female with minute scapus (Fig. 10D), membranous copulatory ducts and coiled spermathecae (Figs 2C, 9B-D); male palp with long and coiled embolus (Figs 2D, 10A-C), cymbium relatively simple including few modifications, like cymbial process, cymbial groove, and primary and secondary cymbial conductors. *M. tasmaniae* is the only described species of *Mysmena* occurring in Tasmania. General color appearance, size, habitat and web architecture are quite similar in both Australian *Mysmena* species (Figs 1, 3), but *M. tasmaniae* can be distinguished from *M. leichhardti* sp. nov. by the lack of carapace dimorphism, the general conformation and the size difference of male and female genitalia, being *M. leichhardti* sp. nov. genitalia almost double in size (see Fig. 2).

New Morphological Data. **Male** (AMS KS 34486): Femoral spot on legs I and II. Median tarsal claw on leg IV slender, elongate, sinuous. **Palp and copulatory bulb** (Figs 2D, 10A-C): Tibia broad distally, without apophyses, tibial rim with long aligned setae, except prolaterally. Cymbium oriented prolateral-ventral on palp. Cymbium with pointed tip and cymbial fold. Setae of cymbial fold (CyFs) as surrounding setae. Two apical furrows functioning as cymbial conductors (primary and secondary, CyC1 and CyC2, respectively), associated to



FIG. 1. Extended focal plane images of Australian *Mysmena* species. Left column: lateral view; central column: dorsal view; right column: ventral view. **A**, *M. leichhardti* sp. nov. (paratypes); top row: male, bottom row: female; **B**, *M. tasmaniae* Hickman, 1979 (Newall Creek); top row: male, bottom row: female.

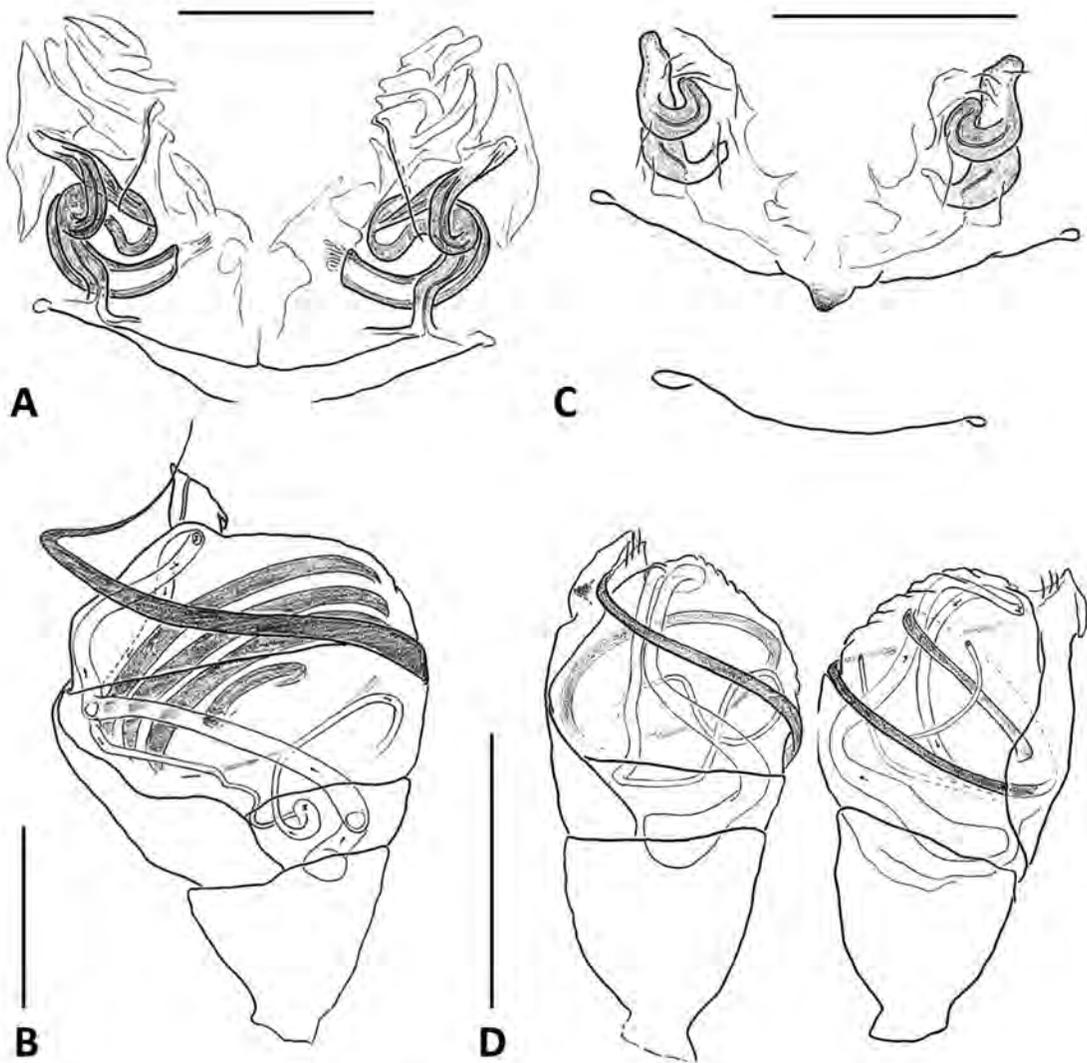


FIG. 2. Cleared genitalia. **A-B**, *Mysmena leichhardti* sp. nov. **A**, female (paratype) epigynum, ventral view; **B**, male (holotype), left palp and tibia, ventral view. **C-D**, *Mysmena tasmaniae* Hickman, 1979; **C**, female (Newall Creek) epigynum, ventral view; **D**, male (AMS KS 34486), right palp and tibia (inverted), prolateral (left image) and retrolateral (right image) views. All scale bars: 0.1 mm.

embolus, running parallel to each other. CyC2 subtle, difficult to observe, on prolateral apical margin. CyC1 with an apical bend. Cymbial groove (CyG) present. Small pointed cymbial process (CyP) located dorsally and apically. Paracymbium (PC) large, flat, medially located, with setae. Conductor (C) present, globose,

concealing base of embolus, with groove hosting embolus. Exposed part of embolus relatively long and coiled. Pars pendula present.

Female (Newall Creek). **Respiratory system** (Figs 9A, 10D): Arrangement of the tracheal system as in *M. leichhardti* sp. nov. (see above), except the anterior tracheae internally inter-



FIG. 3. Web architecture of Australian *Mysmena*. **A**, *M. leichhardti* sp. nov. from Atherton Plateau, Queensland. *Top left*: typical habitat where webs are found (photo L.L., R3-f34); *Top right*: close up of typical spherical orbweb, from a female (photo L.L., R4-f02); *Bottom left*: spherical orbweb built within a cubical natural frame, showing diversity and plasticity of web architectures according to surrounding substrate, female (photo L.L., R4-f32); **B**, *M. tasmaniae* Hickman, 1979, from St. Columba Falls, Tasmania; webs around tree ferns, a male and a female were collected from the left and right webs, respectively (photo L.L., R3-f06).

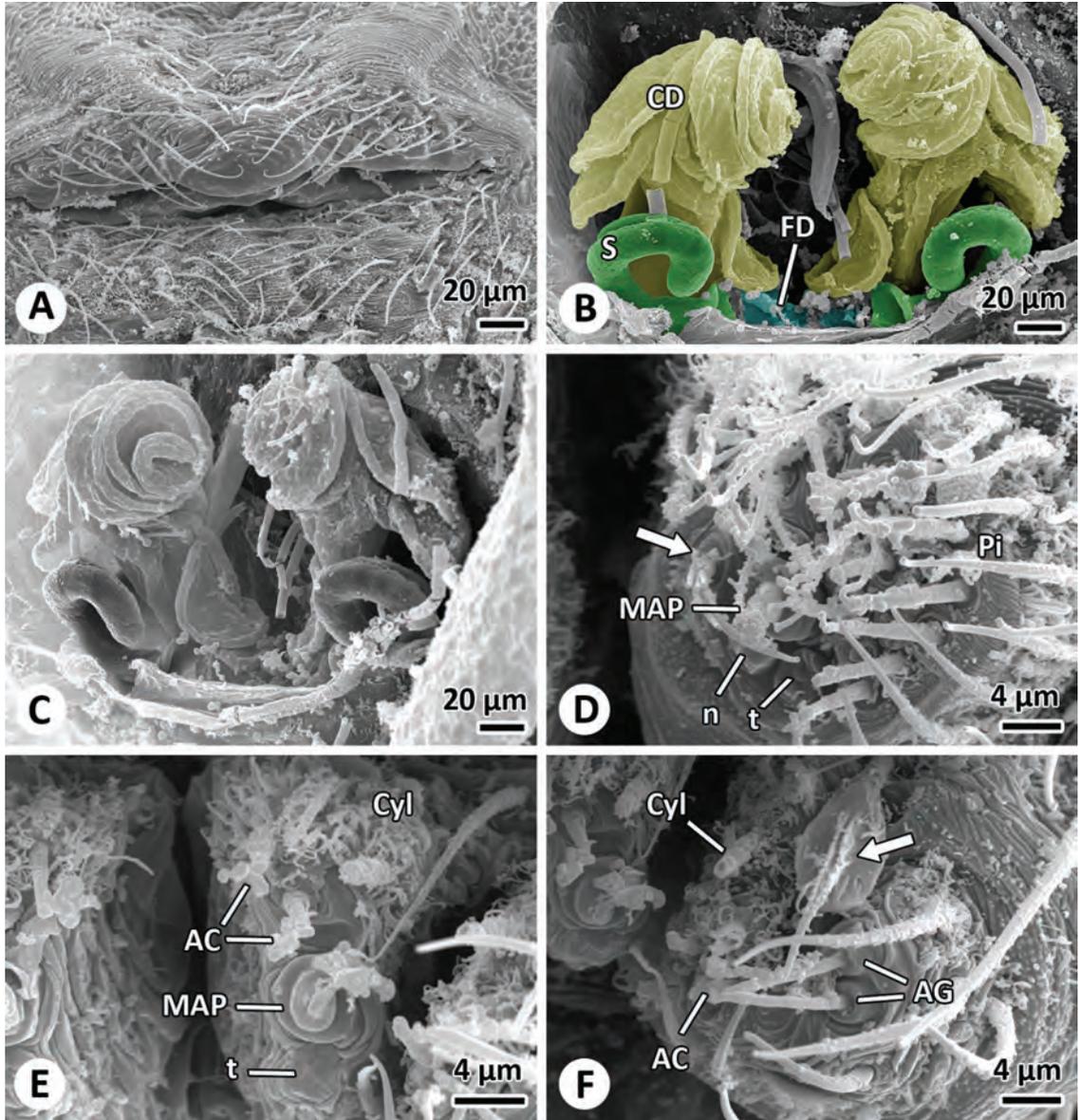


FIG. 4. *M. leichhardti* sp. nov. female **A**. Abdomen detail, ventral view, epigastric furrow and external epigynal area. **B-C**, Digested abdomen showing internal genitalia, anterior tracheal system removed; **B**, dorsal view, copulatory ducts (CD) in yellow, spermathecae (S) in green, fertilization ducts (FD) in blue; **C**, lateral view; **D-F**, Close up of right spinnerets spinning area; **D**, Anterior lateral spinnerets, arrow to single modified seta on MAP field; **E**, Posterior median spinnerets; **F**, Posterior lateral spinnerets, arrow to anterior flat spatulate modified seta.

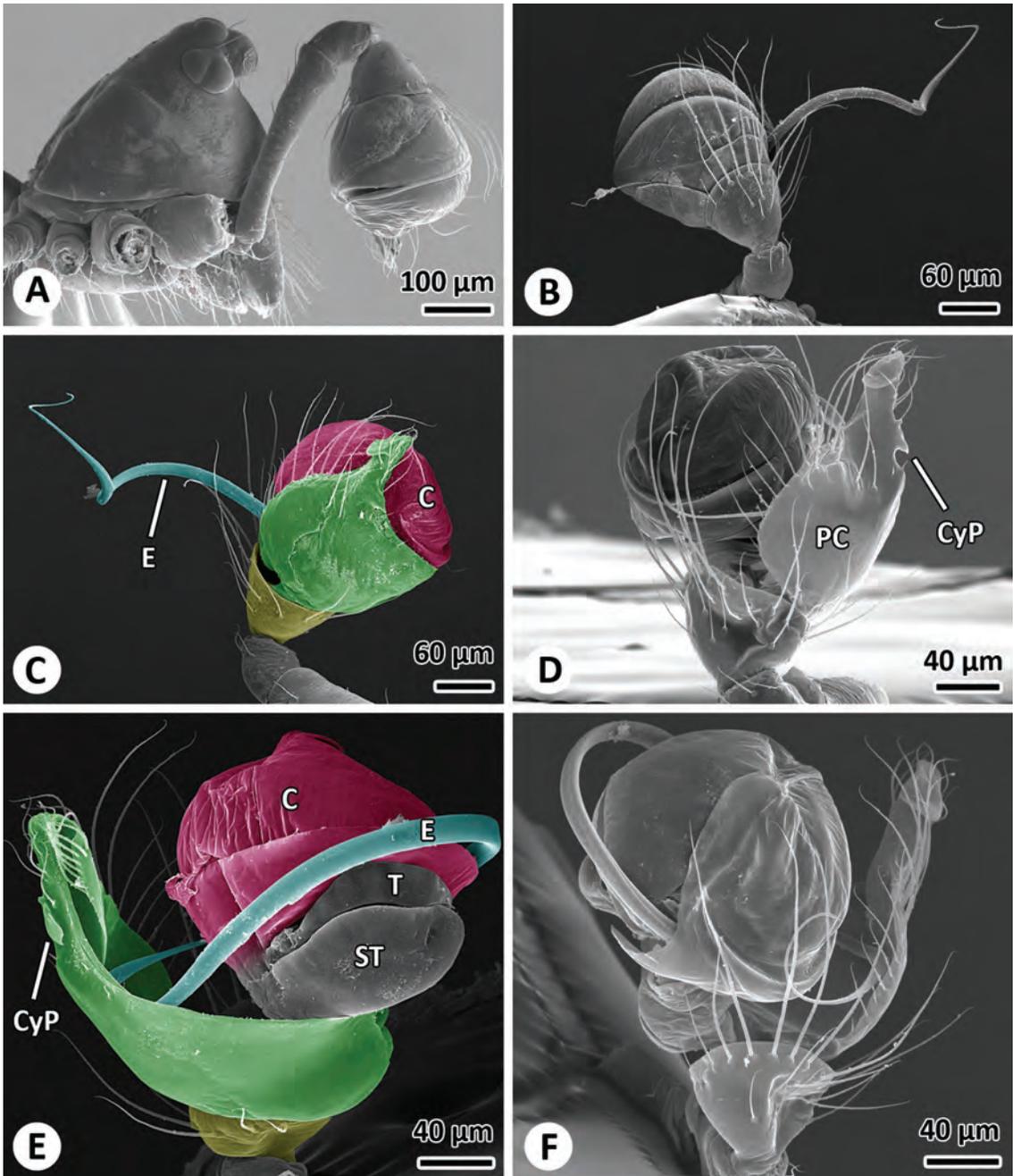


FIG. 5. *M. leichhardti* sp. nov. male **A**, Carapace and right palp, lateral view. **B-F**, Left palp. When colored (i.e., **C**, **E**), the conductor is depicted in red, cymbium in green and embolus in blue; **B**, Ventral-proximal view; **C**, Dorsal view; **D-F**, Left palp slightly expanded as found naturally in collected specimens preserved in 80% ethanol; **D**, retrolateral view; **E**, prolateral view; **F**, ventral-retrolateral view.

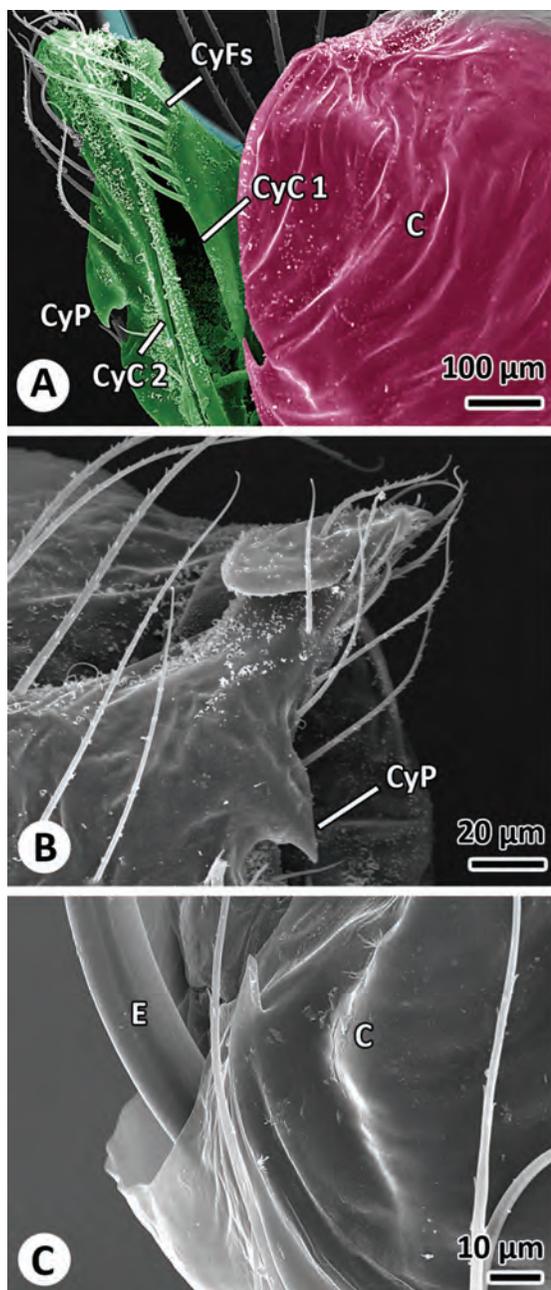


FIG. 6. *M. leichhardti* sp. nov. male A-C. Details of left palp. A, Cymbial conductors and fold, prolateral view; B, Cymbial tip on retrolateral view; C, exposed part of embolus emerging from concealing conductor.

connected by a membranous duct. **Spinnerets** (not shown): Spinneret field ventrally on abdomen. Colulus large, fleshy, triangular, about half length of ALS. Six spinnerets. ALS MAP with nubbin and tartipore, Pi spigots with reduced base. PMS with two AC, posterior mAP with tartipore, one CY. PLS with anterior distinctly flat spatulate modified seta, two slim CY spigots, at least three AC, triad spigots of similar size (FLA plus two AGs) present at least in females. **Epigynum** (Figs 2C, 9B-D): Epigynal area not sclerotized, scapus minute, triangular and slightly sclerotized. Copulatory openings not visible. Copulatory ducts (CD) membranous and widely convoluted, seeming to open from common membranous internal atrium. Spermathecae (S) sclerotized, coiled. Fertilization ducts (FD) distinguishable although weakly sclerotized, short.

Natural history. Many details of the natural history of *M. tasmaniae* have been reported by Hickman (1979). We manually collected specimens from their webs in very humid and hidden habitats such as in leaf litter or tree trunk crevices. Both males and females, along with juveniles, seem to spin the typical spherical webs as reported for other *Mysmena* and *Microdipoena* species (Fig. 3B). Web architecture was however originally described as “few irregular threads, most of which were in a horizontal plane” (Hickman 1979, p. 77). In addition, the web reported for *M. tasmaniae* in Lopardo *et al.* (2011: fig. 5a) is a misidentification (pers. obs.). The web architecture of *M. tasmaniae* is therefore reported here for the first time.

Distribution. Known from Tasmania, Australia.

DISCUSSION

The general conformation of the male palp of *M. leichhardti* sp. nov. (two parallel cymbial conductors producing a pointed tip, shape of the paracymbium, and a distal globose conductor partially concealing the embolus) as well as the female epigynum and vulva, agrees with the general morphology of other *Mysmena* species (particularly the type species, *M. leucoplagiata*) and therefore justifies its

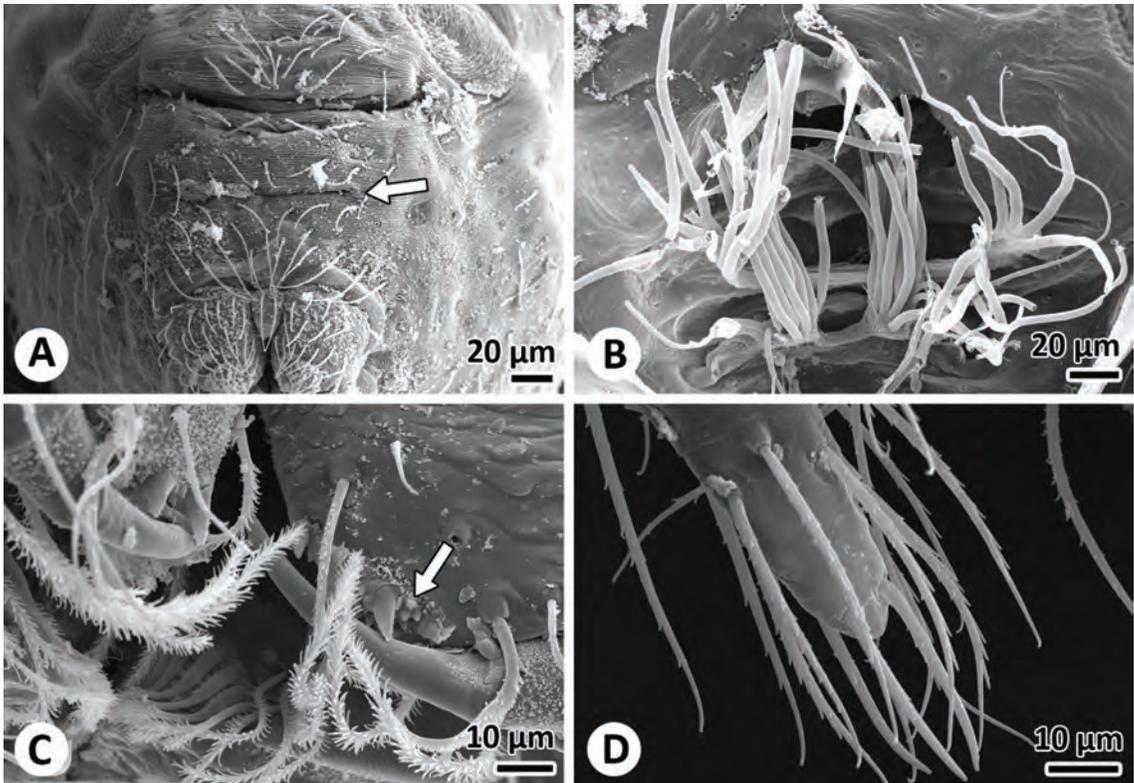


FIG. 7. *M. leichhardti* sp. nov. A-C, Male. A, Abdomen, ventral view, note epiandrous spigots area with two bundles of fusules; arrow to posterior wide respiratory spiracle; B, Digested abdomen showing internal respiratory tracheal arrangement; C, Tip of chelicerae, arrow to denticles in fang furrow; D, Female tip of right palp.

assignment to the genus *Mysmena*. In addition, the generic placement of both *Mysmena* species reported here was corroborated by the most comprehensive phylogenetic analysis including the largest sample of mysmenid representatives to date (see Lopardo *et al.* 2011: fig. 12).

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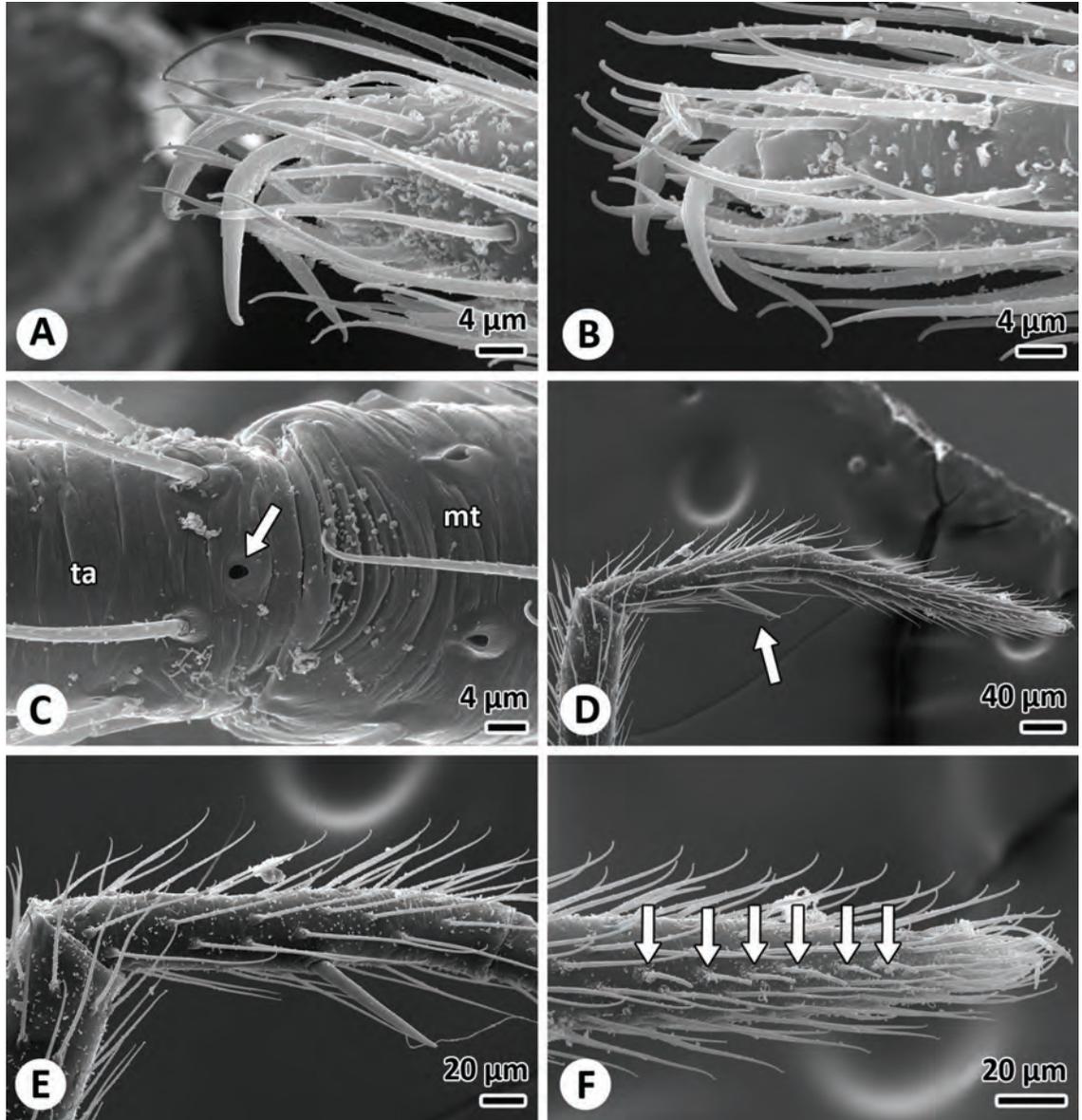


FIG. 8. *M. leichhardti* sp. nov. A-C, Female right legs. A, leg I, tarsal claws, prolateral view; B, leg IV, tarsal claws, prolateral view, note sinuous and slender median claw; C, Tarsus-metatarsus joint, dorsal view, arrow to tarsal organ. D-F, Male left leg I, prolateral view; D, Tarsus and metatarsus, arrow to metatarsal clasp spine; E, same, detail of metatarsus and clasp spine; F, Detail of tarsus tip, arrows to prolateral row of short modified setae on distal half.

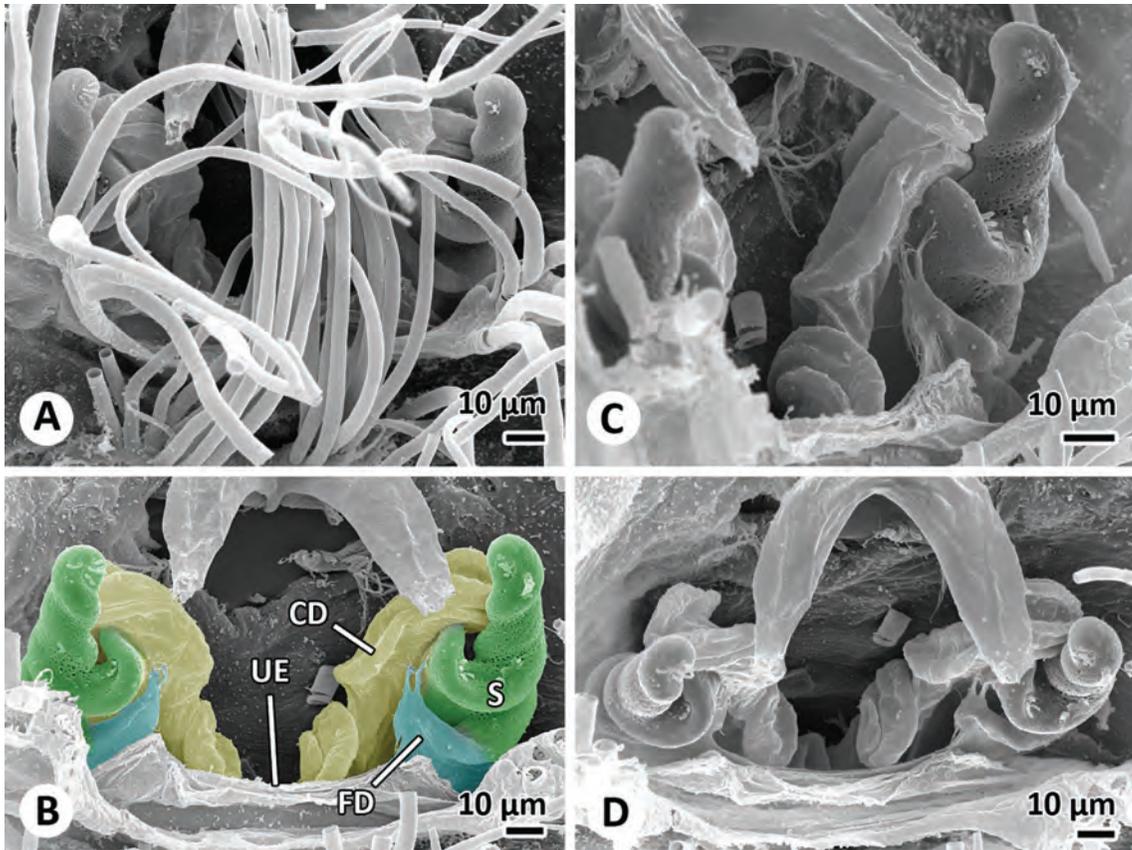


FIG. 9. *M. tasmaniae* Hickman, 1979 female digested abdomen. **A**, Internal respiratory arrangement. **B-D**, Internal genitalia, anterior tracheal system removed; **B**, dorsal view, copulatory ducts (CD) in yellow, spermathecae (S) in green, fertilization ducts (FD) in blue; **C**, lateral view; **D**, Anterior view.

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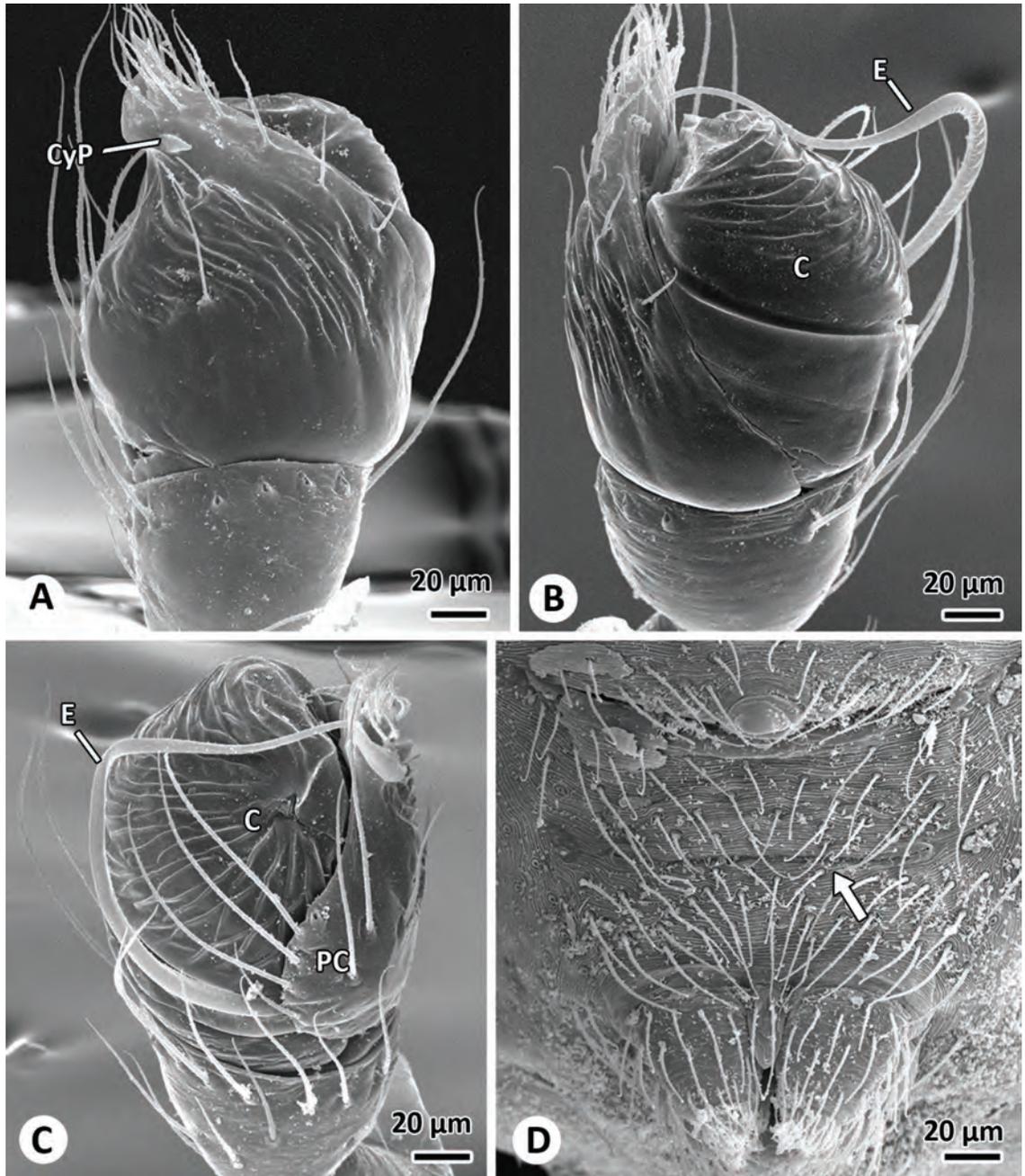


FIG. 10. *M. tasmaniae* Hickman, 1979. A-C, Male left palp. A, Dorsal view; B, prolateral view; C, retrolateral-anterior view; D, Female abdomen, ventral view, note epigastric furrow and external epigynal area, arrow to posterior wide respiratory spiracle.

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