

A PROPOSAL AND REVIEW
OF THE SPIDER FAMILY
SYNOTAXIDAE
(ARANEAE, ARANEOIDEA),
WITH NOTES ON
THERIDIID INTERRELATIONSHIPS

RAYMOND R. FORSTER, NORMAN I. PLATNICK,
AND JONATHAN CODDINGTON



BULLETIN
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY
NUMBER 193
NEW YORK : 1990

Recent issues of the *Novitates* may be purchased from the Museum. Lists of back issues of the *Novitates*, *Bulletin*, and *Anthropological Papers* published during the last five years are available free of charge. Address orders to: American Museum of Natural History Library, Department D, Central Park West at 79th St., New York, N.Y. 10024.

A PROPOSAL AND REVIEW
OF THE SPIDER FAMILY
SYNOTAXIDAE
(ARANEAE, ARANEOIDEA),
WITH NOTES ON
THERIDIID INTERRELATIONSHIPS

RAYMOND R. FORSTER

*Thorne Research Fellow, Department of Entomology
American Museum of Natural History
Director Emeritus, Otago Museum, Dunedin, New Zealand*

NORMAN I. PLATNICK

*Chairman and Curator, Department of Entomology
American Museum of Natural History
Adjunct Professor, Department of Biology
City College, City University of New York
Adjunct Professor, Department of Entomology
Cornell University, Ithaca, N.Y.*

JONATHAN CODDINGTON

*Associate Curator, Department of Entomology
National Museum of Natural History
Smithsonian Institution, Washington, D.C.*

BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY

Number 193, 116 pages, 397 figures

Issued February 28, 1990

Price: \$10.40 a copy

CONTENTS

Abstract	3
Introduction	3
Acknowledgments	4
The Subfamily Physogleninae	4
Key to Genera	6
<i>Physoglenes</i> Simon	7
<i>Meringa</i> Forster, new genus	11
<i>Tupua</i> Platnick, new genus	26
<i>Paratupua</i> Platnick, new genus	33
The Subfamily Pahorinae	36
Key to Genera	39
<i>Pahora</i> Forster, new genus	40
<i>Pahoroides</i> Forster, new genus	53
<i>Wairua</i> Forster, new genus	57
<i>Nomaua</i> Forster, new genus	59
<i>Runga</i> Forster, new genus	68
Possible Relatives	76
<i>Mangua</i> Forster, new genus	76
<i>Chileotaxus</i> Platnick, new genus	94
<i>Synotaxus</i> Simon	96
Relationships and Familial Placement	97
Notes on Theridiid Interrelationships	110
References	115

ABSTRACT

The previously monotypic subfamily Physogleninae Petrunkevitch is redefined to include *Physoglenes* Simon—containing *P. vivesi* Simon and three new species from Chile—and three new genera: *Meringa*, containing nine new species from New Zealand; *Tupua*, containing four new species from Tasmania; and *Paratupua*, containing one new species from Victoria. The physoglenine genera are united by unique modifications of the male pedicel and anterior abdominal region. The new subfamily Pahorinae is established for five new genera from New Zealand: *Pahora* (containing nine new species), *Pahoroides* (containing two new species), *Wairua* (containing two new species), *Nomaia* [containing five new species and *N. crinifrons* (Urquhart), transferred from the linyphiid genus *Bolyphantes*], and *Runga* (containing five new species). The pahorine genera are united by a carapace-abdomen stridulatory system, secretory pores on the male pars cephalica, and a deeply excavated paracymbial area on the male palp. Three other genera seem closely related to physoglenines and pahorines: *Mangua*, new genus, containing 13 new species and *M. forsteri* (Brignoli), transferred from *Linyphia*, all from New Zealand; *Chileotaxus*, new genus, containing one new species from Chile; and the Neotropical genus *Synotaxus* Simon.

These spiders have been widely separated in some past classifications; *Physoglenes* has been variously considered a leptonetid, pholcid, theridiid, or araneoid incertae sedis, whereas the other previously described taxa have generally been considered theridiids or linyphiids. All 12 genera are united by the presence of a small, basally situated and dorsally excavated paracymbium, a longitudinal incision of the retrolateral cymbial margin, thickened (and sometimes spiniform) dorsal macrosetae on the male palpal femur, patella, and/or tibia, and greatly elongated, spineless legs, with the first pair much the longest and all femora basally thickened. The known web forms are diverse, including an irregular sheet (*Mangua* and at least

some physoglenines), an inverted bowl (pahorines), and a latticelike structure (*Synotaxus*). The absence of a comb on tarsi IV and widened aggregate spigots on the posterior lateral spinnerets, and the presence of a basal paracymbium, indicate that these genera do not belong to the Theridiidae, and the male palpi lack the distinct embolic division including a radix typical of the Linyphiidae. The oldest family-group name available for the assemblage is Synotaxidae, based on Synotaxea Simon.

Synotaxidae is hypothesized to be the sister group of Nesticidae plus Theridiidae. Wunderlich's synonymy of the families Hadrotarsidae and Theridiidae appears to be justified by paracymbial morphology; two possibly monophyletic groups can be recognized among the genera that are currently considered valid members of those families. The genera *Anatea* Berland, *Audifia* Keyserling, *Dipoena* Thorell, *Dipoenata* Wunderlich, *Euryopis* Menge, *Gmogola* Keyserling, *Guaraniella* Baert, *Hadrotarsus* Thorell, *Lasaeola* Simon, and *Yoroa* Baert are apparently united by a suite of characters (a dorsoventrally flattened female palpal claw, shortened chelicerae with elongated fangs, specialized ventral setae on tarsus I, a series of parallel ridges on the medial surface of the anterior lateral spinnerets, and four rather than two spermathecae) and may all be specialized predators of ants; the earliest available name for the assemblage is Hadrotarsinae Thorell. At least the genera *Anelosimus* Simon, *Chrosiothes* Simon, *Chryso* O. P.-Cambridge, *Coleosoma* O. P.-Cambridge, *Helvibis* Keyserling, *Nesticodes* Archer, *Rugathodes* Archer, *Spintharus* Hentz, *Tekellina* Levi, *Theridula* Emerton, *Thwaitesia* O. P.-Cambridge, and *Thymoites* Keyserling are apparently united by a distinctive paracymbial hood. The name Spintharinae Simon is available for this assemblage; if Spintharinae is monophyletic, the genera *Achaearanea* Strand and *Anelosimus*, as currently construed, may be polyphyletic assemblages that require relimitation.

INTRODUCTION

The spiders of the south temperate parts of the world have proved, over recent years, to be a considerable challenge to arachnologists. As is the case for many other groups of arthropods, the major outlines of spider classification were largely worked out by European authors of the 19th century. The family-

level groups recognized in their classifications (and thus familiar to most present-day arachnologists) are based largely on Holarctic taxa; although they work reasonably well for north temperate species, they frequently fail abysmally when tropical and south temperate taxa are considered. Most austral spiders are

still undescribed, and often cannot be placed easily in any well-known, Holarctic family. In this paper, we discuss the systematics of some web-building spiders found in Chile, New Zealand, and Australia that amply illustrate these problems; we first outline some relatively clear-cut and homogeneous groups, and then consider what their relationships may be, both to each other and to more commonly recognized taxa.

ACKNOWLEDGMENTS

This work was partially supported by the Scientific Distribution Committee of the Golden Kiwi Lottery Fund and by National Science Foundation grants BSR-8312611 and BSR-8406225. Scanning electron microscope facilities were made available by the University of Otago Medical School. Illustrations were supplied by Dr. Mohammad Shadab of the American Museum of Natural History. We thank Drs. M. Harvey of the Western Australian Museum, A. F. Millidge of Devon, England, and B. D. Opell of Virginia Polytechnic Institute for helpful comments on a draft of the manuscript. All mea-

surements are in millimeters; abbreviations used for eye pattern descriptions are standard for the Araneae. We are indebted to the following institutions and curators for access to relevant specimens:

AMNH	American Museum of Natural History, New York
AMS	Australian Museum, Sydney, M. R. Gray
EDA	Entomology and Ecology Divisions, Department of Scientific and Industrial Research, Auckland, J. S. Dugdale, J. C. Watt, G. Ramsey
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, H. W. Levi
MNHN	Muséum National d'Histoire Naturelle, Paris, J. Heurtault
NMW	National Museum, Wellington, R. G. Ordish, R. L. Palma
OMD	Otago Museum, Dunedin
QMB	Queensland Museum, Brisbane, R. J. Raven
USNM	National Museum of Natural History, Smithsonian Institution, Washington
VVH	V. V. Hickman collection, Hobart, Tasmania, J. Hickman

THE SUBFAMILY PHYSOGLLENINAE

The subfamily Physogleninae contains only a single previously described species, *Physoglenes vivesi* Simon (1904) from Chile. Simon placed this species in the family Leptonetidae, commenting (1904: 87) that among the leptonetids, *Physoglenes* "est peut-être le type le plus complet et le mieux caractérisé." Simon acknowledged that the eye pattern of the genus, with eight eyes in two normal rows, does not correspond to that of any of the other genera then included in the Leptonetidae, and that the male palp is "plus complexe" than that of the other leptonetid genera. Why Simon opted for this familial placement is open only to conjecture; he noted merely that the chelicerae and mouthparts resemble those of leptonetids. We suspect that Simon was struck by the peculiar modifications of the pedicel and anterior portion of the abdomen shown by his single male specimen, which vaguely resemble the pedicel and

abdominal modifications found in some telemids (then included in the Leptonetidae).

The subsequent history of the genus is scarcely less odd. Fage (1912: 108), who presumably had access to Simon's holotype, commented on *Physoglenes* in the course of a comparison of leptonetids and ochyroceratids, concluding that the genus "est probablement un *Théridide* du groupe des *Argyrodes*." Petrunkevitch (1928) subsequently established the subfamily Physogleninae, placing it in the family Pholcidae. No explanation was provided either for the establishment of the subfamily or for its transfer to the Pholcidae, and it is extremely unlikely that Petrunkevitch ever examined specimens of *Physoglenes*. Perhaps he merely surmised from Simon's description of the eye arrangement that placing the genus in the Leptonetidae is entirely untenable, and therefore followed Simon's comments that the thoracic

groove and extremely long legs of *Physoglenes* resemble those of pholcids.

Petrunkévitch's unexplained transfer was not questioned by subsequent reviewers and catalogers (Gerhardt and Kästner, 1938: 600; Roewer, 1942: 352; Bonnet, 1958: 3652), who seem to have been unaware of Fage's earlier, contradictory conclusion. Among modern students, only the late Paolo Brignoli noted the enigma posed by *Physoglenes*; although he was initially unable to locate Simon's holotype, he concluded (1978: 11) that *Physoglenes* "does not belong to any described family of the Haplogynae; it belongs either to some family of the 'Semientelegynae' (Araneoidea) or to a still undescribed family." Although he subsequently discovered the holotype (in MNHN), the poor condition of that specimen makes it unsurprising that, in the absence of modern material, Brignoli (1983) was still able only to consider the genus as incertae sedis at the family level.

Fortunately, collections made in Chile over the past decade have included both males and females of *Physoglenes* that have allowed us to determine that Brignoli was largely correct. These are entelegyne spiders with no close relationships to leptonetids, telemids, pholcids, or any other classical "haplogyne" group; rather, they seem to be araneoids (but not "semientelegyne" ones). In addition, the modern Chilean specimens have allowed us to determine that close relatives of *Physoglenes* occur in New Zealand, Tasmania, and Victoria. So far as we have been able to determine, none of these Australasian taxa have previously been described, although the late Prof. V. V. Hickman had collected Tasmanian specimens and had contemplated describing them (as a new genus of the araneoid family Theridiidae).

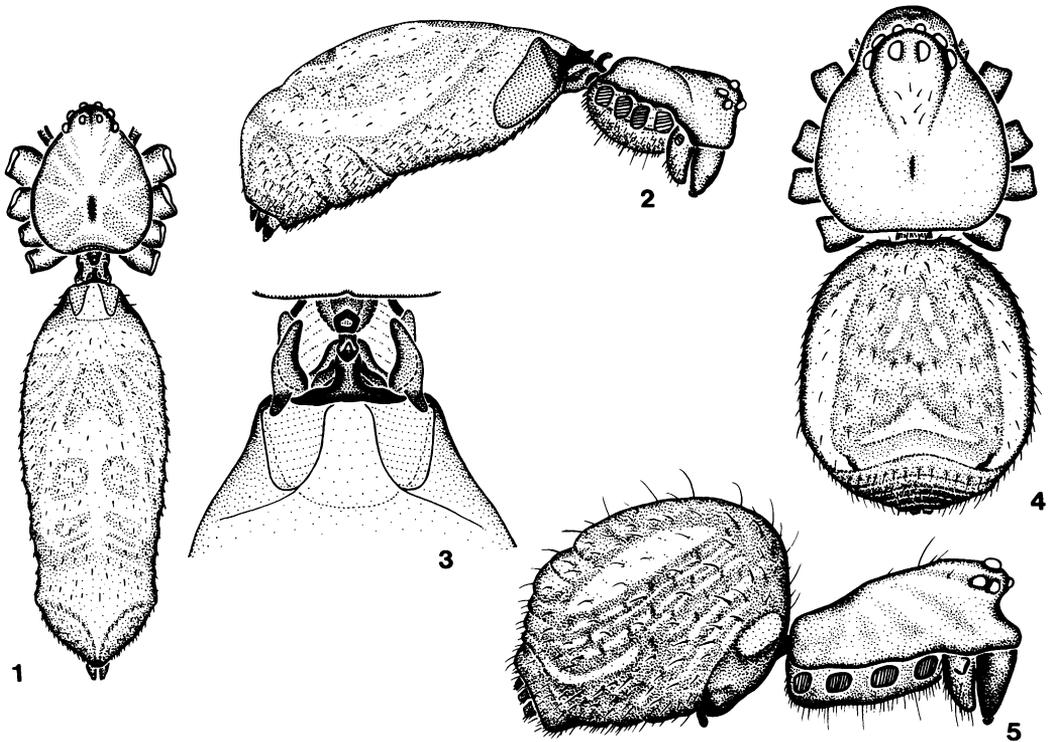
PHYSOGLENINAE PETRUNKEVITCH

Physogleninae Petrunkevitch, 1928: 44, 112 (type genus *Physoglenes* Simon).

DIAGNOSIS: Members of this subfamily can be recognized by the uniquely modified pedicel and anterior abdominal region of males. Although the details of the modifications vary among genera, the pedicel is heavily sclerotized and opposes equally sclerotized abdominal elaborations (figs. 3, 33, 97, 122); it is

possible that these sclerotizations have a stridulatory function, although no typical stridulatory file is present and it seems likely that only single, strong vibrations can be generated. The sexual dimorphism is considerable; whereas males have long, *Pholcus*-like abdomens (fig. 1), females have short, ovoid to pear-shaped abdomens (fig. 4). Both sexes have extremely long legs devoid of spines (although long bristles are found on the patellae and tibiae of females).

DESCRIPTION: Small to medium-size (total length 1.5–5.2) cribellate, entelegyne, web-building araneomorph spiders. Carapace finely reticulate, slightly longer than wide; cephalic region narrow, usually only half of greatest width of pars thoracica; thoracic groove a shallow depression. Eight eyes, posterior row distinctly recurved; AME dark, usually smaller than other, light, subequal eyes; PME clearly separated by at least their diameter, sometimes closer to lateral eyes (fig. 32). Clypeus vertical, height 3–5 times AME diameter, with or without modified setae in ocular area, without glandular pores; AME often overhanging clypeus (figs. 2, 5). Chelicerae vertical, without lateral condyles or stridulatory ridges, sometimes longer or with anterolateral tubercles in males; promargin with 3–5 strong teeth; retromargin smooth or with single distal tooth; fang furrow with row of denticles (figs. 31, 49, 76); cheliceral glands opening through pores on surface posterior to tip of fang (fig. 31). Endites inclined over labium but not meeting, about 1.5 times longer than wide (fig. 51); serrula a row of closely spaced, evenly sized teeth. Labium distinctly rebordered, twice as wide as long (fig. 51). Sternum usually longer than wide, often tuberculate (fig. 48), broadly clavate posteriorly, separating coxae IV by their width (fig. 48). Leg formula 1243 or 1423, legs long, slender, leg I much longer than others; trochanters not notched; no spines; bristles present distally on patellae and proximally on tibiae of females; trichobothria present at least on tibiae, bases with only traces of posterior hood (figs. 34, 53, 78); tarsal organ an evenly rounded dome (fig. 77); three claws, superior claws with four or five teeth on basal half, inferior claw almost as long as superiors but without teeth (figs. 36, 50); group of strong, serrate hairs (false claws) situated at base of



Figs. 1–5. *Physoglenes puyehue*, new species. 1. Male, dorsal view. 2. Male, lateral view. 3. Male, pedicel and anterior abdominal region, dorsal view. 4. Female, dorsal view. 5. Female, lateral view.

claws (fig. 50); leg setae smooth or slightly barbed (fig. 35). Abdomen usually patterned with dark pigment, lightly clothed with smooth hairs, generally pear-shaped in side view in females, elongate in males, where anterior portions of abdomen bear sclerotizations associated with expanded, heavily sclerotized pedicel (figs. 1–3); six spinnerets with small colulus bearing two or three setae; posterior spiracle situated at base of spinnerets, leading to simple, four-branched tracheal system restricted to abdomen. Male palp with one or more macrosetae (sometimes spini-form) on tibia and usually with long macroseta on distodorsal surface of patella; paracymbium present as small, retrolaterally situated, dorsally excavated basal lobe; retrolateral cymbial margin with narrow longitudinal incision (figs. 8, 62, 102, 127); embolus spiniform, curved. Female palp with strong, smooth claw. Epigynum variable, inconspicuous to protuberant, with or without

posterior lobe; internal genitalia with moderately convoluted ducts.

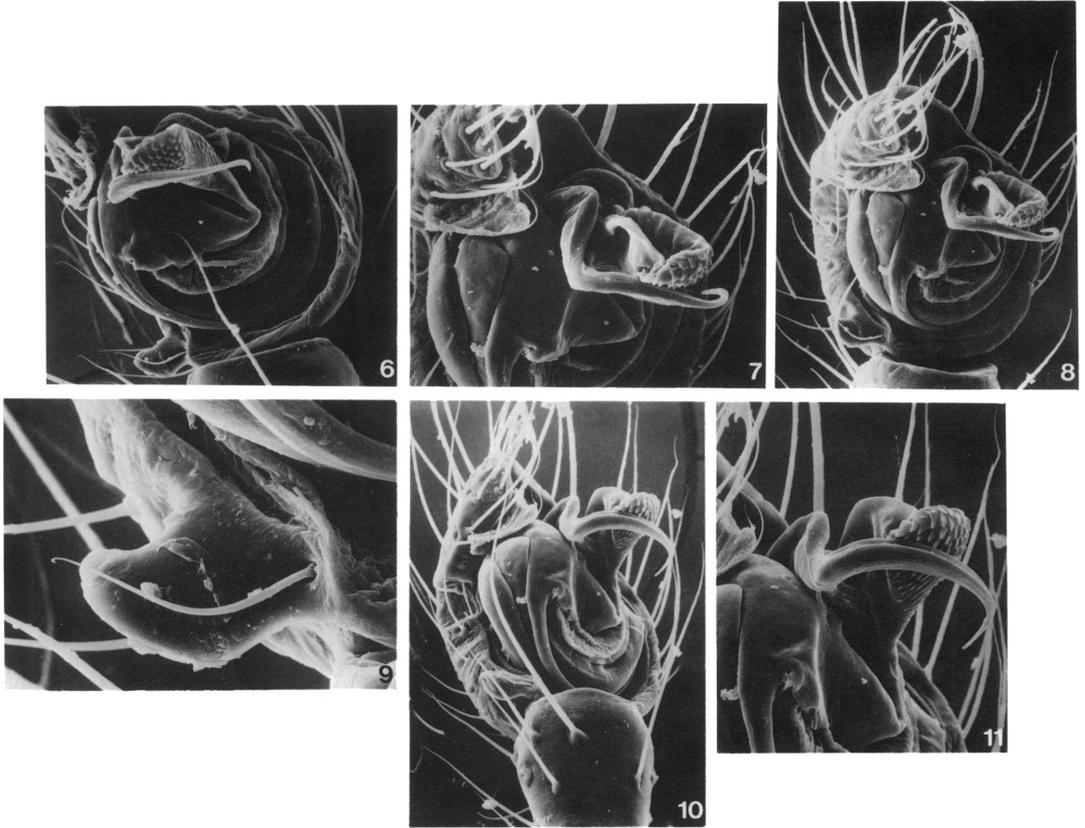
INCLUDED GENERA: *Physoglenes*, *Meringa*, *Tupua*, and *Paratupua*.

DISTRIBUTION: Known only (and respectively) from Chile, New Zealand, Tasmania, and Victoria.

NATURAL HISTORY: At least *Meringa* and *Tupua* construct small, irregular, sheetlike webs on or near the forest floor, under logs, or in moss, litter, low shrubs, and grasses.

KEY TO GENERA OF PHYSGLENINAE

1. Ocular area with pair of anteriorly directed, elongate macrosetae originating along midline just behind AME (figs. 95, 98, 120, 123); Tasmania and Victoria 2
- Ocular area without elongate macrosetae; Chile and New Zealand 3
2. Male palpal tibia relatively long (figs. 125–127); internal female genitalia with highly con-



Figs. 6–11. *Physoglenes puyehue*, new species, right male palp. 6–8. Ventral view. 9. Paracymbium and basal portion of cymbial incision. 10. Retrolateral view; note length of cymbial incision. 11. Palpal conductor, retrolateral view.

- voluted ducts (fig. 129); Victoria *Paratupua*
- Male palpal tibia relatively short (figs. 100–102); internal female genitalia without highly convoluted ducts (figs. 104, 106, 114, 116); Tasmania *Tupua*
- 3. Male palpal tibia with spiniform macroseta (figs. 40, 56, 64, 75); epigynum consisting only of pair of small openings near epigastric furrow; New Zealand *Meringa*
- Male palpal tibia with long macroseta only (fig. 14); epigynum protuberant, with distinct posterior lobe (as in figs. 5, 16, 17); Chile *Physoglenes*

PHYSOGLENES SIMON

Physoglenes Simon, 1904: 87 (type species by monotypy *Physoglenes vivesi* Simon).

DIAGNOSIS: The opposing, medial protuberances on the pedicel and anterior abdom-

inal sclerotization of males (fig. 3), and the protuberant epigynum with a distinct posterior lobe of females (fig. 16), are diagnostic.

DESCRIPTION: AME distinctly smaller than other eyes; MOQ wider behind than in front and than long. Sternum wider than long, smooth, broadly clavate behind, with scattered, exceptionally long setae originating from pale areas. Pedicel heavily sclerotized medially and laterally, medially with elevated protuberance (fig. 3). Female abdomen pyriform; male abdomen elongate, more than twice as long as wide, drooping posteriorly, anterodorsal surface with transverse ridge bearing anteromedial projection elevated at distal tip and pair of posteriorly directed subtriangular sclerotizations. Leg formula 1423 or 1243. Patella and tibia of male palp each with non-spiniform macroseta on distodorsal surface; embolus elongate, curved; paracym-

bium a small, retrolaterally projecting lobe. Epigynum protuberant, with posterior lobe; internal genitalia consisting of pair of relatively large, anteriorly situated, rounded receptacula, each with short rodlike fertilization duct and convoluted duct leading to posteriorly situated exterior openings (fig. 19).

DISTRIBUTION: Known only from Chile.

Physoglenes vivesi Simon

Physoglenes vivesi Simon, 1904: 88 (male holotype from Los Perales, Valparaíso, Region de Valparaíso (V), Chile, in MNHN, examined).

DIAGNOSIS: The holotype male (and only known specimen) is in extremely poor condition, being almost completely bleached. Both palpi are present but expanded and badly distorted and deteriorated; details are almost impossible to discern, even over a black background, but the palpal tibia is relatively longer than in *P. puyehue* or *P. lagos*, and the conductor appears to be shorter than in those species. The type was taken far to the north of any modern specimens, and the species will remain poorly known until topotypes can be collected.

MALE: Total length 3.11. Carapace 0.86 long, 0.80 wide. Abdomen 2.14 long, 1.15 wide. Most leg segments missing, femoral lengths: I 4.24, II missing, III 1.61, IV 2.89. Eye sizes and interdistances: AME 0.04, ALE 0.05, PME 0.06, PLE 0.06; AME-AME 0.05, AME-ALE 0.06, PME-PME 0.09, PME-PLE 0.05, ALE-PLE 0.02; MOQ length 0.13, front width 0.13, back width 0.21. Clypeal height almost five times AME diameter. Coloration unknown (specimen bleached). Palp 0.86 long, tibial macroseta undetectable, tibia relatively long.

FEMALE: Unknown.

MATERIAL EXAMINED: Only the holotype, collected by C. Porter and M. Edwards.

DISTRIBUTION: Known only from Valparaíso, Chile.

Physoglenes puyehue Platnick,
new species
Figures 1-19

TYPE: Male holotype taken in a window trap at an elevation of 200 m in a Valdivian rainforest 7.7 km NE of Termas de Puyehue,

Osorno, Region de los Lagos (X), Chile (Dec. 19-25, 1982; A. Newton, M. Thayer), deposited in AMNH.

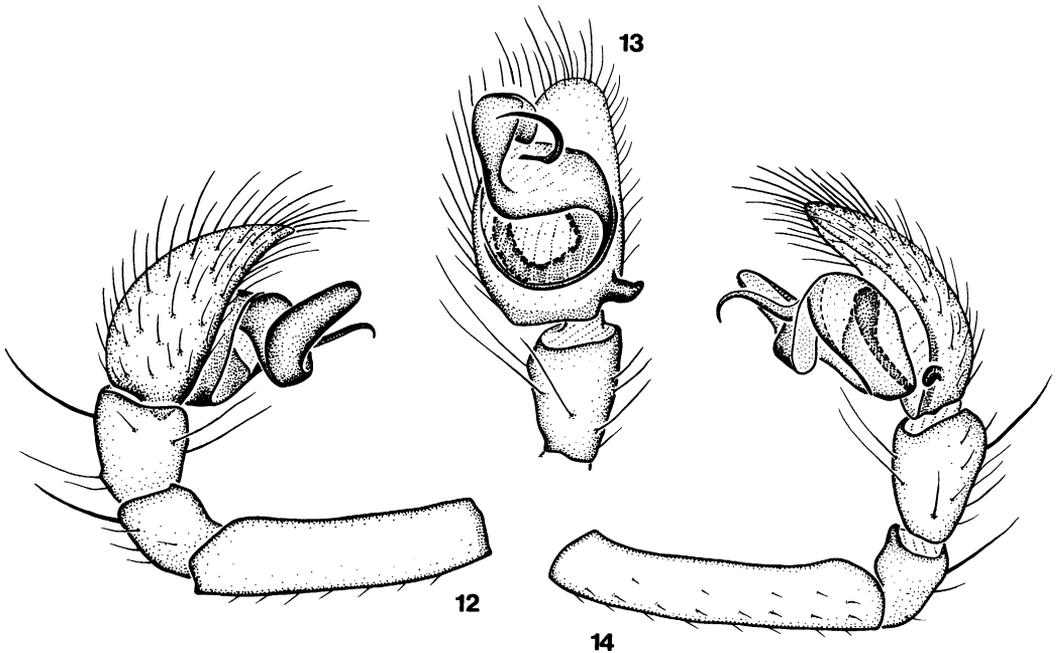
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be distinguished from those of *P. lagos* by the more rounded palpal conductor (fig. 13) and from those of *P. vivesi* by their shorter palpal tibia. Females can be distinguished from those of *P. lagos* and *P. chepu* by the large lateral epigynal ducts (fig. 19).

MALE: Total length 3.19. Carapace 0.86 long, 0.75 wide. Abdomen 2.23 long, 0.91 wide. Leg lengths: I 13.80, II 8.70, III 5.74, IV 7.16. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.05, PLE 0.06; AME-AME 0.07, AME-ALE 0.05, PME-PME 0.11, PME-PLE 0.07, ALE-PLE 0.03; MOQ length 0.17, front width 0.15, back width 0.22. Clypeal height almost five times AME diameter. Carapace light brown with pale yellow medial area; abdomen gray with lateral and median longitudinal white stripes and white posterior chevrons. Palp (figs. 6-14) 0.79 long, patella and tibia each with single, subdistal, nonspiniiform macroseta; palpal conductor relatively short, evenly curved throughout length.

FEMALE: Total length 2.03. Carapace 0.83 long, 0.75 wide. Abdomen 1.28 long, 0.96 wide. Leg lengths: I 8.21, II 5.11, III 3.88, IV 5.52. Eye sizes and interdistances: AME 0.05, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.05, AME-ALE 0.05, PME-PME 0.08, PME-PLE 0.05, ALE-PLE 0.02; MOQ length 0.16, front width 0.15, back width 0.20. Clypeal height as in male. Pars cephalica darker than pars thoracica; abdominal coloration as in male. Epigynum (figs. 15-19) deeply excavated in front of protruding posterior lip; internal genitalia with large lateral ducts.

OTHER MATERIAL EXAMINED: CHILE: **Region de los Lagos (X): Osorno:** Aguas Calientes, Parque Nacional Puyehue, Dec. 18, 1984-Feb. 8, 1985, elev. 600 m, malaise trap, beech forest (S. and J. Peck, AMNH), 1♂; Derumbes Forest Trail, Aguas Calientes, Parque Nacional Puyehue, Dec. 20, 1984-Feb. 8, 1985, elev. 500 m, flight intercept trap (S. and J. Peck, AMNH), 1♂; hills S Maicolpué, Jan. 26, 1986, elev. 75 m, wet disturbed forest (N. I. Platnick, R. T. Schuh, AMNH), 2♀;



Figs. 12-14. *Physoglenes puyehue*, new species, left male palp, prolateral, ventral, and retrolateral views.

10 km E Puyehue, Jan. 27, 1986, elev. 180 m, disturbed forest (N. I. Platnick, R. T. Schuh, AMNH), 1♀.

DISTRIBUTION: Known only from Osorno, Region de los Lagos (X), Chile.

***Physoglenes lagos* Platnick,**
new species
Figures 20-26

TYPE: Female holotype from a wet disturbed forest at an elevation of 75 m in hills S of Maicolpué, Osorno, Region de los Lagos (X), Chile (Jan. 26, 1986; N. I. Platnick, R. T. Schuh), deposited in AMNH.

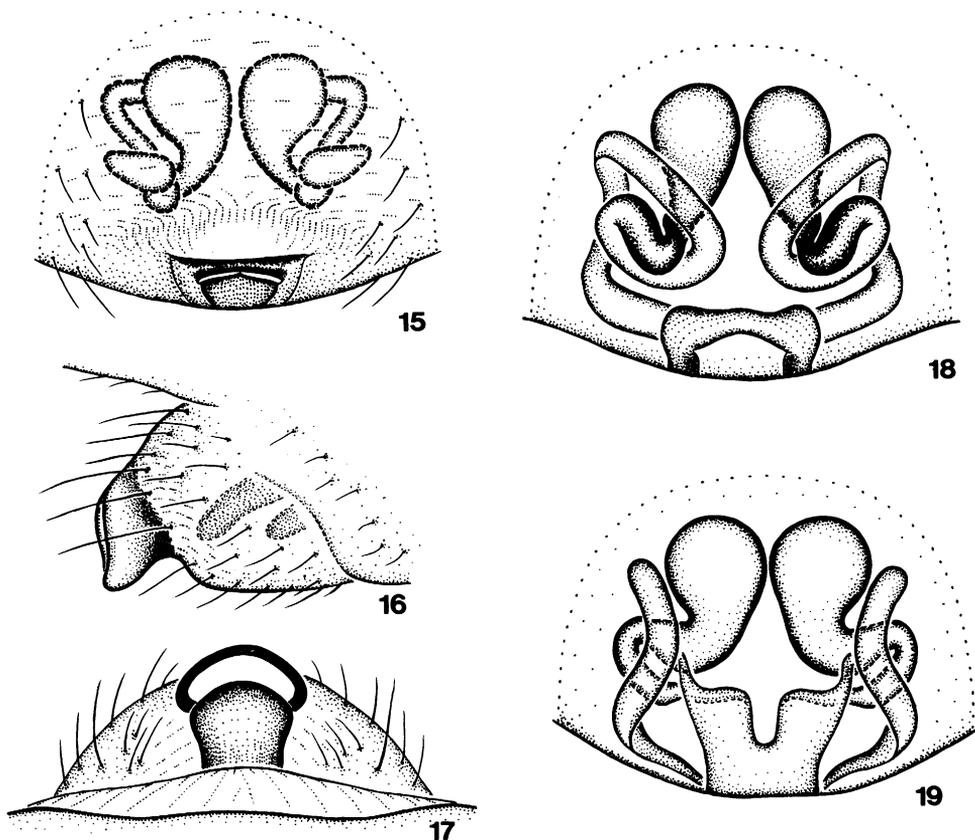
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The male palpal conductor (figs. 21) is longer and less evenly rounded than in *P. puyehue*; the female genitalia resemble those of *P. chepu* in having a posteriorly elongated receptacular stem, but the epigynal atrium is much more deeply depressed than in that species (figs. 23, 25).

MALE: Total length 4.01. Carapace 1.05 long, 0.98 wide. Abdomen 2.89 long, 1.20

wide. Leg lengths: I 11.82, II 7.99, III 5.25, IV 7.16. Eye sizes and interdistances: AME 0.05, ALE 0.07, PME 0.06, PLE 0.07; AME-AME 0.06, AME-ALE 0.06, PME-PME 0.12, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.16, front width 0.16, back width 0.24. Clypeal height four times AME diameter. Carapace with pars cephalica marked with lateral and median dark stripes, connected posteriorly by two transverse bars; pars thoracica with scattered submarginal dark spots; abdomen gray with lateral and median longitudinal white stripes on anterior half and white chevrons on posterior half. Palp (figs. 20-22) 0.79 long, patella and tibia each with single, subdistal, nonspiniiform macroseta, patellar macroseta stronger than tibial; palpal conductor relatively long, almost straight basally.

FEMALE: Total length 1.65. Carapace 0.83 long, 0.75 wide. Abdomen 1.13 long, 0.88 wide. Leg lengths: I 5.36, II 4.09, III 2.85, IV 4.67. Eye sizes and interdistances: AME 0.05, ALE 0.05, PME 0.06, PLE 0.06; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.07, PME-PLE 0.05, ALE-PLE 0.01; MOQ length 0.15,



Figs. 15–19. *Physoglenes puyehue*, new species, epigynum. 15. Ventral view. 16. Lateral view. 17. Posterior view. 18. Ventral view, cleared. 19. Dorsal view.

front width 0.13, back width 0.19. Clypeal height as in male. Carapace markings less distinct than in male; posterior abdominal chevrons broken at middle by longitudinal dark stripe. Epigynum (figs. 23–26) deeply excavated in front of protruding posterior lip, anterior margin of excavation slightly extended posteriorly along midline; internal genitalia with receptacula on long, heavily sclerotized stems.

OTHER MATERIAL EXAMINED: CHILE: **Region de la Araucania (IX): Malleco:** 40 km W Angol, Parque Nacional Nahuelbuta, Dec. 9, 1984–Feb. 17, 1985, elev. 1200–1500 m, flight intercept trap, beech-araucarian forest (S. and J. Peck, AMNH), 2♂; Parque Nacional Nahuelbuta, Feb. 1, 1986, elev. 1230 m, dry forest (N. I. Platnick, R. T. Schuh, AMNH), 1♂. **Region de los Lagos (X): Osorno:** hill S Maicolpué, Jan. 26, 1986, elev. 75 m, wet

disturbed forest (N. I. Platnick, R. T. Schuh, AMNH), 1♀.

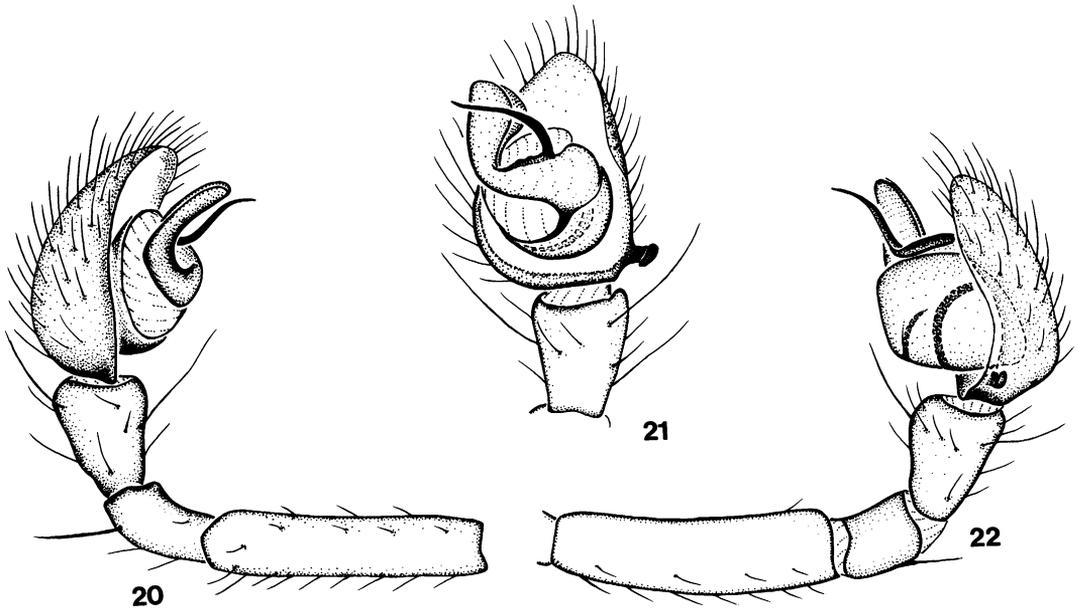
DISTRIBUTION: Known only from two localities in south-central Chile; males and females have not been collected together and may be mismatched.

Physoglenes chepu Platnick,
new species
Figures 27–30

TYPE: Female holotype collected at an elevation of 17 m at Chepu on the northwest coast of Isla de Chiloé, Chiloé, Region de los Lagos (X), Chile (Nov. 29, 1981; N. I. Platnick and R. T. Schuh), deposited in AMNH.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The female genitalia resemble those of *P. lagos* in having a posteriorly elon-



Figs. 20–22. *Physoglenes lagos*, new species, left male palp, prolateral, ventral, and retrolateral views.

gated receptacular stem, but the epigynal atrium lacks the deep depression found in that species (figs. 27, 29).

MALE: Unknown.

FEMALE: Total length 1.54. Carapace 0.79 long, 0.64 wide. Abdomen 0.90 long, 0.68 wide. Leg lengths: I 6.19, II 4.50, III 3.36, IV 4.88. Eye sizes and interdistances: AME 0.04, ALE 0.05, PME 0.05, PLE 0.06; AME-AME 0.04, AME-ALE 0.05, PME-PME 0.06, PME-PLE 0.05, ALE-PLE 0.02; MOQ length 0.12, front width 0.12, back width 0.16. Clypeal height four times AME diameter. Carapace yellow with vague indications of darker markings on sides of pars cephalica; abdomen gray with two lateral longitudinal white stripes and median series of six transverse white chevrons, anterior two chevrons broken at middle by longitudinal dark stripe. Epigynum (figs. 27–30) with strongly protuberant posterior lip but only shallowly excavated in front of lip; internal genitalia with receptacula on wide, heavily sclerotized stems.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Chiloe Island, Chile.

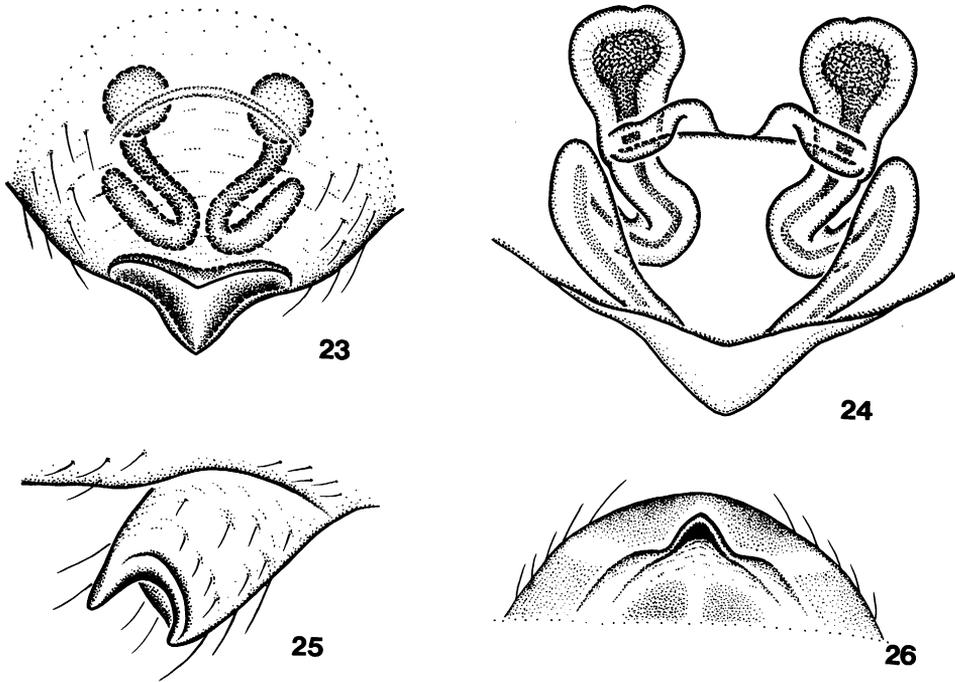
MERINGA FORSTER, NEW GENUS

TYPE SPECIES: *Meringa otago* Forster, new species.

ETYMOLOGY: The generic name is an arbitrary combination of letters considered feminine in gender.

DIAGNOSIS: The presence of at least one spiniform macroseta on the male palpal tibia separates *Meringa* from the other physoglenine genera; females lack the ocular macrosetae of the two Australian genera and the protuberant epigynum of *Physoglenes*.

DESCRIPTION: AME distinctly smaller than other eyes; MOQ wider behind than in front and than long. Sternum longer than wide, broadly clavate behind, covered with large tubercles (fig. 48), each with single apical hair. Female abdomen pyriform; male abdomen elongate, almost three times as long as wide, curved so that ventral surface is concave; anterodorsal surface with transverse ridge beyond which surface is depressed and furnished with ridges (figs. 33, 71); epiandrous spigots in two widely separated bunches immediately behind margin of epigastric furrow. Pedicel expanded with lateral lobes; sur-



Figs. 23–26. *Physoglenes lagos*, new species, epigynum. 23. Ventral view. 24. Dorsal view. 25. Lateral view. 26. Posterior view.

face behind lobes corrugated. Leg formula 1423; trichobothrial base with posterior hood reduced to two small ridges or absent. Patella of male palp with long macroseta on distodorsal surface; tibia with at least one spini-form macroseta; embolus spini-form, curved; paracymbium a small lobe. Epigynum consisting only of pair of small openings near epigastric furrow; internal genitalia consisting of pair of relatively large, ovoid receptacula, each with short rodlike internal fertilization duct and curved or convoluted duct leading to exterior openings (fig. 46).

DISTRIBUTION: Known only from New Zealand (North Island, South Island, and Stewart Island).

NATURAL HISTORY: The web is small and seems to have no particular form. It is usually constructed among moss and litter on or near the forest floor, or under logs, but the spiders are also found in clumps of sedge and dense, low foliage. No eggsacs have been observed and it is not known whether these spiders carry their eggsac as in *Mangua*.

Meringa otago Forster,
new species

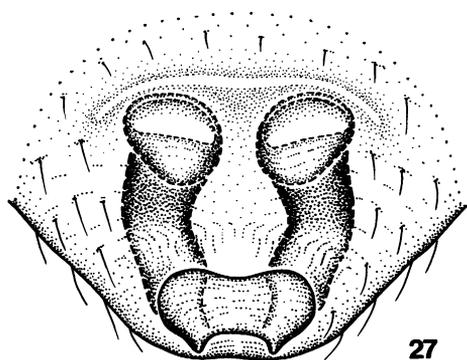
Figures 31–42, 82

TYPES: Male holotype and female allotype taken in leaf litter at Waipori Gorge, Otago, South Island, New Zealand (Feb. 12, 1979; R. R. Forster), deposited in OMD.

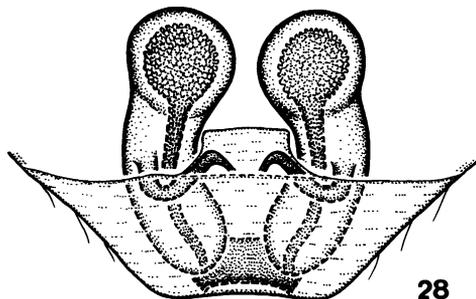
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species is characterized by the large, longitudinally oriented female receptacula (fig. 82) and the three macrosetae on the male palpal tibia, of which the distal prolateral one is distinctly modified (figs. 40–42).

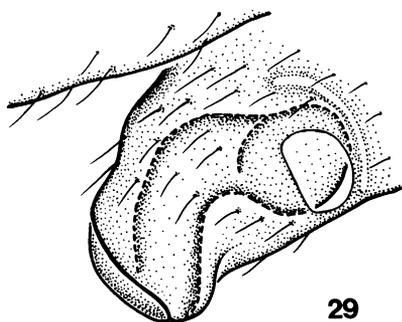
MALE: Total length 3.18. Carapace 0.95 long, 0.82 wide. Abdomen 2.21 long, 0.76 wide. Leg lengths: I 7.06, II 4.41, III 3.15, IV 4.47. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.06; AME-AME 0.03, AME-ALE 0.06, PME-PME 0.08, PME-PLP 0.07, ALE-PLP 0.02; MOQ length 0.17, front width 0.11, back width 0.20. Clypeal



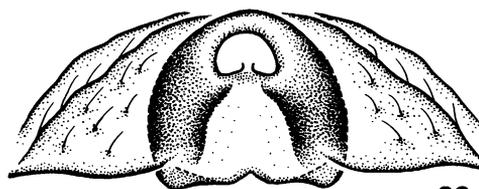
27



28



29



30

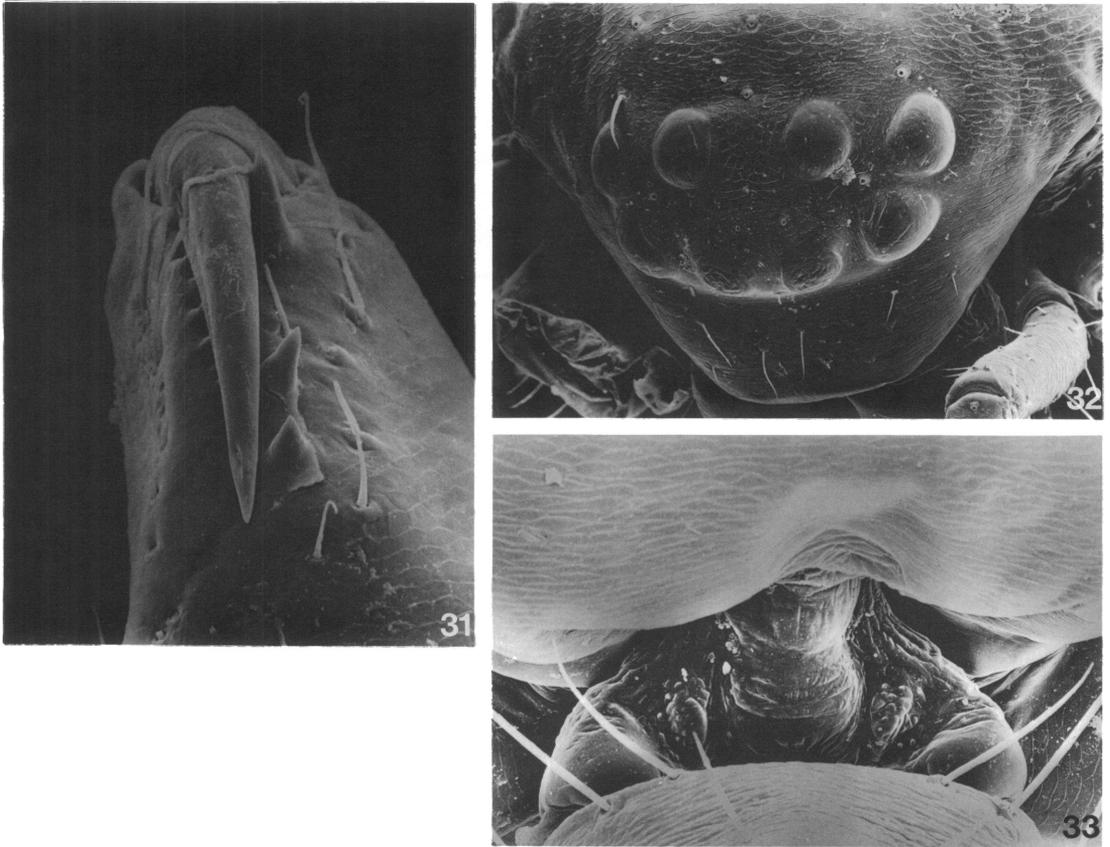
Figs. 27–30. *Physoglenes chepu*, new species, epigynum. 27. Ventral view. 28. Dorsal view. 29. Lateral view. 30. Posterior view.

height four times AME diameter. Carapace heavily shaded with blackish brown pigment; chelicerae and endites dark brown; sternum yellow-brown but margins shaded with black; legs brown with faint banding; abdomen patterned with black as in *M. hinaka* (figs. 43, 45). Palp (figs. 37–42) 0.88 long; three tibial macrosetae, one large middorsal and two distal; more prolateral distal macroseta swollen at base but extended as slender spine (fig. 42).

FEMALE: Total length 2.07. Carapace 0.82 long, 0.69 wide. Abdomen 1.32 long, 0.82 wide. Leg lengths: I 7.06, II 4.41, III 3.15, IV 4.47. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.02, AME-ALE 0.03, PME-PME 0.07, PME-PLP 0.06, ALE-PLP 0.01; MOQ length 0.15, front width 0.07, back width 0.19. Clypeal height four times AME diameter. Coloration as in male. Paired receptacula large, longitudinally oriented (fig. 82).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Otago:* Cemetery Bush, Opoho, Jan. 11, 1971, leaf litter (C. L. Wilton, OMD), 1♀, Mar.–Apr. 1971, pitfall (C. L. Wilton, OMD), 1♂, 1♀; Evansdale Glen, June 11, 1967 (C. L. Wilton, OMD), 1♂; Leith Saddle, Dunedin, Mar. 4, 1970, leaf litter (R. R. Forster, C. L. Wilton, OMD), 1♀, June 28, 1975, beating shrubs (R. R. Forster, OMD), 2♀, Nov. 15, 1980, leaf litter (R. R. Forster, OMD), 2♀; Sullivans Dam, Dunedin, from fuchsia bark, June 11, 1979 (J. Kikkawa, OMD), 1♂; forest near Taieri Mouth, Nov. 26, 1966 (C. L. Wilton, OMD), 1♀; Trotters Gorge, Mar. 10, 1975 (R. R. Forster, OMD), 1♂; Waipori Gorge, Nov. 13, 1970, leaf litter (R. R. Forster, C. L. Wilton, AMNH), 1♂, 2♀; Whare Flat, Mar. 20, 1979, leaf litter (R. R. Forster, OMD), 1♂.

DISTRIBUTION: Known only from mid-coastal Otago, South Island, New Zealand.



Figs. 31–33. *Meringa otago*, new species. 31. Chelicera, medial view. 32. Clypeus and ocular area, oblique anterior view. 33. Male pedicel, dorsal view.

Meringa hinaka Forster,
new species
Figures 43–57

TYPE: Male holotype taken from at Kaka Point Reserve, Otago, South Island, New Zealand (Mar. 4, 1988; R. R. Forster), deposited in OMD.

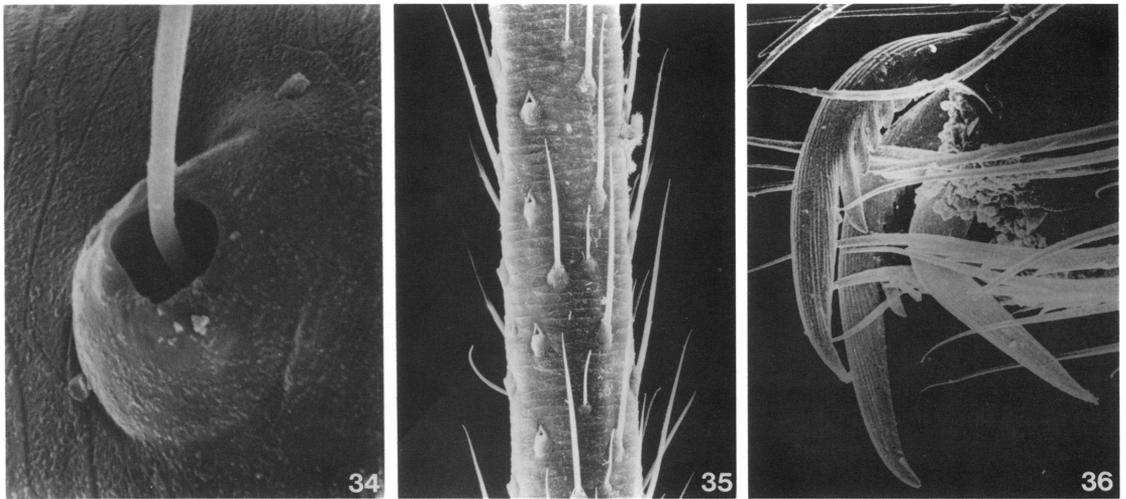
ETYMOLOGY: The specific name is an arbitrary combination of letters.

DIAGNOSIS: This species seems closely related to *M. otago* but can be readily separated by the larger intromittent ducts of females (fig. 46) and the presence of a strongly curved basal macroseta on the male palpal tibia (fig. 56).

MALE: Total length 4.05. Carapace 1.32 long, 0.88 wide. Abdomen 2.71 long, 1.01 wide. Leg lengths: I 9.89, II 6.43, III 4.91, IV

7.69. Eye sizes and interdistances: AME 0.06, ALE 0.08, PME 0.08, PLE 0.08; AME-AME 0.04, AME-ALE 0.04, PME-PME 0.08, PME-PL 0.07, ALE-PL 0.02; MOQ length 0.21, front width 0.16, back width 0.24. Clypeal height four times AME diameter. Carapace heavily shaded with black except for pale patch around thoracic groove; abdomen patterned with black (figs. 43, 45). Palp (figs. 52, 55–57) 1.01 long; tibia with dorsal trichobothrium showing slight hood (fig. 54) and single basal, broad, curved macroseta (fig. 56); bulb as in figures 52, 55, 57.

FEMALE: Total length 2.39. Carapace 0.82 long, 0.76 wide. Abdomen 1.64 long, 1.07 wide. Leg lengths: I 7.56, II 4.98, III 3.65, IV 5.36. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.02, AME-ALE 0.04, PME-PME 0.09, PME-



Figs. 34–36. *Meringa otago*, new species. 34. Trichobothrium from tibia I, dorsal view. 35. Tarsus I, dorsal view. 36. Claws of tarsus I, lateral view.

PLE 0.06, ALE-PLE 0.02; MOQ length 0.18, front width 0.10, back width 0.23. Clypeal height slightly more than three times AME diameter. Carapace patterned as in male, abdomen as in figures 44, 47. Paired receptacula large, transversely oriented, with large ducts (fig. 46).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Otago:* Catlins, Aug. 31, 1966 (R. R. Forster, OMD), 2♀; Kaka Point Reserve, Mar. 4, 1988, low foliage, sedges, kamahi-podocarp forest (R. R. Forster, AMNH, OMD), 4♂, 9♀; Papatowai, Mar. 16, 1987, litter (R. R. Forster, OMD), 1♂, 1♀; Tautuku, Jan. 11, 1964, litter (R. R. Forster, OMD), 1♂, 5♀, Feb. 14, 1979 (R. R. Forster, OMD), 2♂, Apr. 19, 1982 (R. R. Forster, OMD), 6♀. *Southland:* Pahia, Oct. 10, 1946 (J. H. Sorensen, OMD), 1♂. **Stewart Island:** Bravo, Nov. 25, 1946, under log (R. R. Forster, OMD), 2♀; Easy Cove, southwest Stewart Island, Jan. 26, 1955 (R. K. Dell, B. A. Holloway, NMW), 1♀; Fern Gully, Mar. 9, 1986, leaf litter (R. R. Forster, OMD), 5♀; Golden Bay, Nov. 15, 1961 (R. R. Forster, OMD), 3♂, 1♀; Halfmoon Bay, Nov. 22, 1946 (R. R. Forster, NMW), 1♂, 1♀, Mar. 10, 1948 (O. Allan, OMD), 1♀; South Cape Island, Jan. 4, 1951 (R. K. Dell, B. A. Holloway, NMW), 1♀.

DISTRIBUTION: Known only from southern Otago and western Southland, South Island, and from Stewart Island, New Zealand.

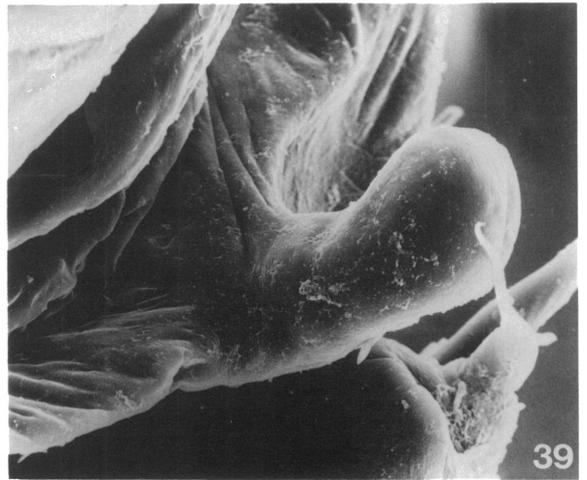
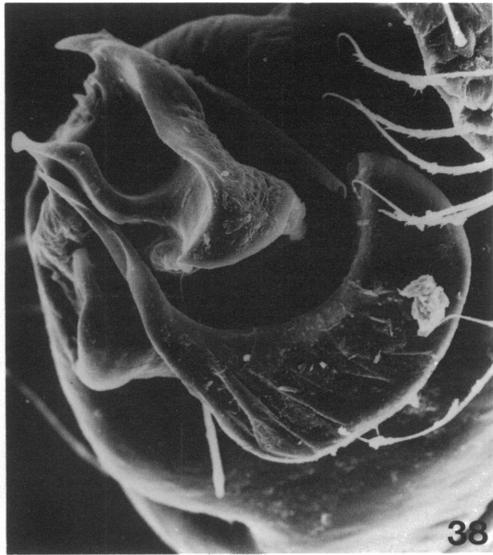
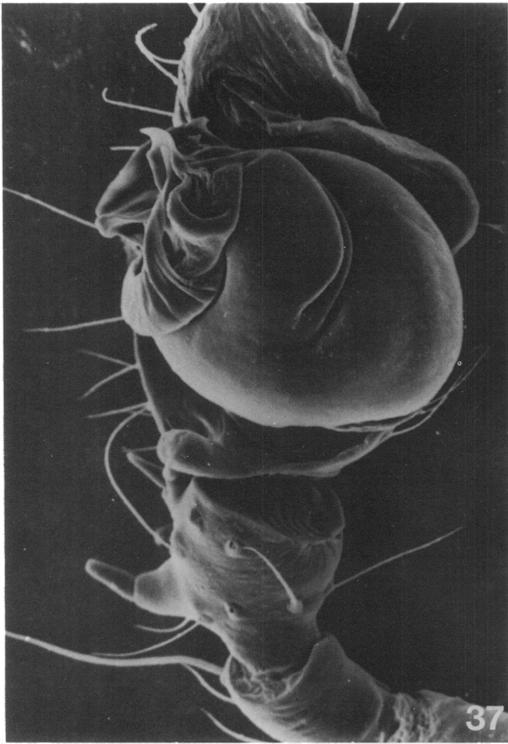
Meringa centralis Forster,
new species
Figures 58–66

TYPES: Male holotype taken in tussock at Temple Basin, Arthurs Pass, Westland, South Island, New Zealand (Nov. 25, 1974; A. D. Blest), and female allotype taken at an elevation of 4000 ft at Kelly's Range, Otira, Westland, South Island, New Zealand (Jan. 26, 1950; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to the distribution in mid-Westland.

DIAGNOSIS: Males can be recognized by the straight, spiniform basal and long, curved distal macrosetae on the palpal tibia (fig. 64), females by the long, transversely oriented in-tromittent ducts (fig. 61).

MALE: Total length 3.78. Carapace 1.26 long, 0.95 wide. Abdomen 2.46 long, 1.07 wide. Leg lengths: I 8.82, II 6.17, III 4.47, IV 6.87. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.07, PME-PLE 0.04, ALE-PLE 0.02; MOQ length 0.18, front width 0.11, back width 0.21. Clypeal



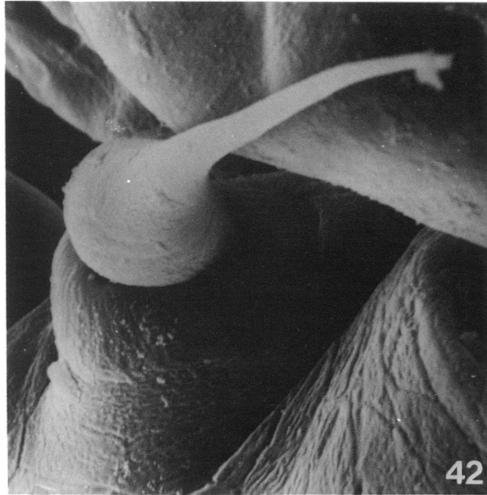
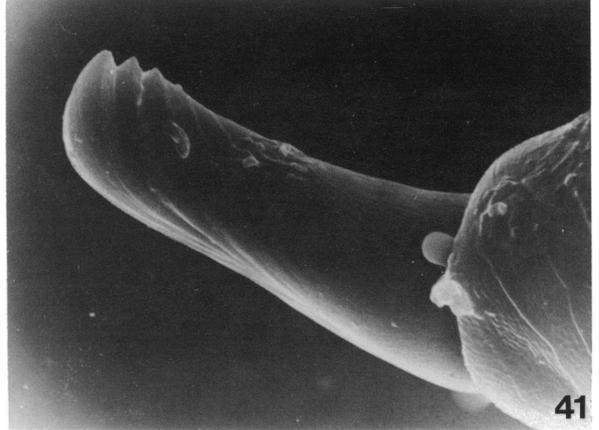
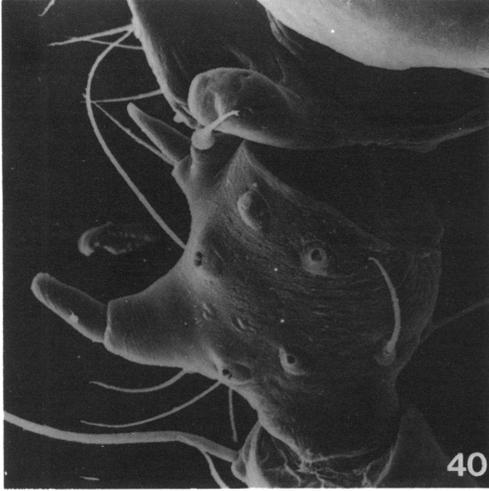
Figs. 37–39. *Meringa otago*, new species, male palp. 37. Right palp, ventral view. 38. Embolar region of left palp, ventral view. 39. Paracymbium of left palp, ventral view.

height about five times AME diameter. Carapace heavily shaded with black except for pale band down midline from ocular area to posterior margin; abdomen patterned as in figure 58. Palp 1.26 long; tibia with distinctly hooded trichobothrium (fig. 65), single proximodorsal spiniform macroseta, more slender than in *M. hinaka* (figs. 64, 66), and two curved distal macrosetae; bulb as in figures 62, 63.

FEMALE: Total length 2.50. Carapace 0.95 long, 0.76 wide. Abdomen 1.76 long, 0.88

wide. Leg lengths: I 6.43, II 4.60, III 3.47, IV 5.04. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.07, PME-PL 0.04, ALE-PL 0.02; MOQ length 0.16, front width 0.11, back width 0.19. Clypeal height almost four times AME diameter. Coloration as in male (figs. 59, 60). Paired receptacula large, obliquely oriented; intermittent ducts long, transversely oriented (fig. 61).

OTHER MATERIAL EXAMINED: NEW ZEA-



Figs. 40–42. *Meringa otago*, new species, right male palp. 40. Tibia, ventral view. 41. Basal tibial macroseta, ventral view. 42. Distal tibial macroseta, ventral view.

LAND: **South Island:** *Westland:* Riordan's Creek, Lewis Pass, Apr. 25, 1977, moss (R. R. Forster, OMD), 1♀.

DISTRIBUTION: Known only from central Westland, South Island, New Zealand.

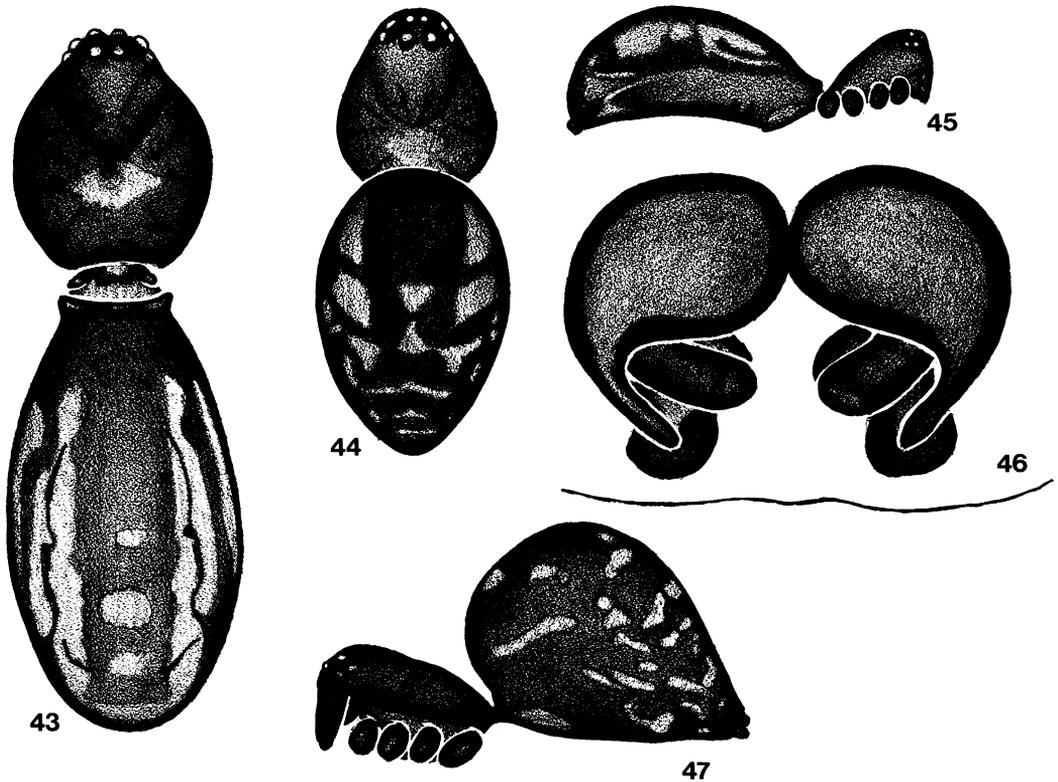
Meringa leith Forster,
new species
Figures 67–78

TYPES: Male holotype and female allotype taken from leaf litter in a mixed rainforest at Leith Saddle, near Dunedin, Otago, South Island, New Zealand (Feb. 3, 1979; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species seems closely related to *M. australis* but can readily be separated by the absence of a proximal macroseta on the male palpal tibia (fig. 72) and by the more convoluted intromittent duct of females (fig. 69).

MALE: Total length 5.19. Carapace 1.64 long, 1.39 wide. Abdomen 3.47 long, 1.01 wide. Leg lengths: I 16.38, II 10.84, III 7.43, IV 11.40. Eye sizes and interdistances: AME 0.07, ALE 0.10, PME 0.10, PLE 0.10; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.11, PME-PLE 0.04, ALE-PLE 0.02; MOQ length 0.26, front width 0.17, back width 0.31. Clypeal height slightly more than three times AME diameter. Carapace brown with darker bands radiating from thoracic groove; ab-



Figs. 43-47. *Meringa hinaka*, new species. 43. Male, dorsal view. 44. Female, dorsal view. 45. Male, lateral view. 46. Epigynum, dorsal view. 47. Female, lateral view.

domen patterned as in figures 67, 71. Palp 1.39 long, tibia without proximal macroseta but with two small macrosetae on distal surface, retrodorsal one apically attenuated (fig. 75); embolus long, coiled around distal processes (figs. 72-74).

FEMALE: Total length 3.35. Carapace 1.26 long, 1.01 wide. Abdomen 2.14 long, 1.39 wide. Leg lengths: I 14.11, II 9.25, III 6.62, IV 9.58. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.02, AME-ALE 0.04, PME-PME 0.07, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.20 long, front width 0.18, back width 0.21. Clypeal height almost four times AME diameter. Carapace patterned as male, abdomen as in figures 68, 70. Paired receptacula relatively narrow, obliquely oriented; intromittent ducts highly convoluted (fig. 69).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Otago:* Leith Saddle, near Dunedin, Oct. 1975, moss (R. R. Fors-

ter, OMD), 1♀, Feb. 11, 1978, litter (R. R. Forster, OMD), 2♀, Feb. 3, 1979, leaf litter, mixed rainforest (R. R. Forster, OMD), 2♀, Nov. 15, 1980, litter (R. R. Forster, OMD), 1♀.

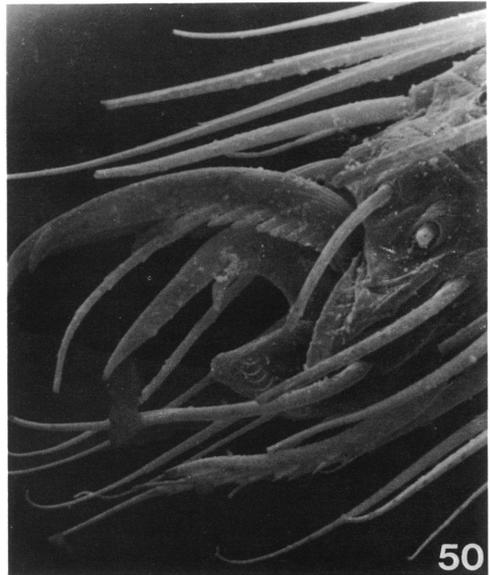
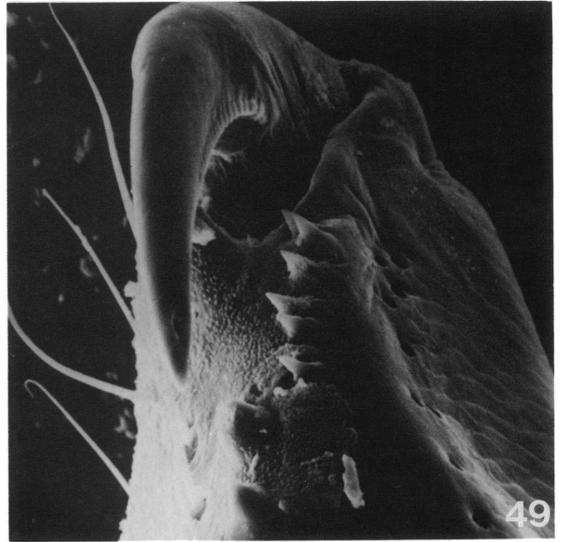
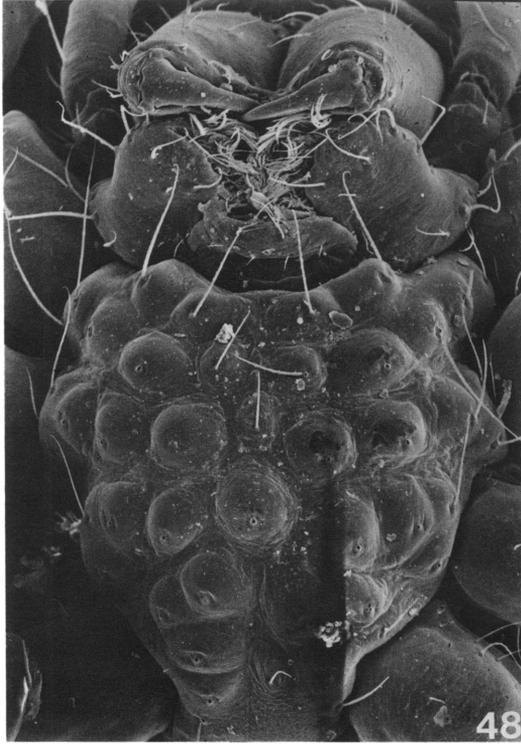
DISTRIBUTION: Known only from a small area of forest near Dunedin, Otago, South Island, New Zealand in which *M. otago* is more commonly found.

Meringa australis Forster,
new species
Figures 79-81, 83

TYPE: Male holotype from the north end of Big South Cape Island, Stewart Island, New Zealand (Jan. 25, 1955; R. K. Dell, B. A. Holloway), deposited in NMW.

ETYMOLOGY: The specific name refers to the occurrence of the species at the south end of New Zealand.

DIAGNOSIS: Males can be recognized by the



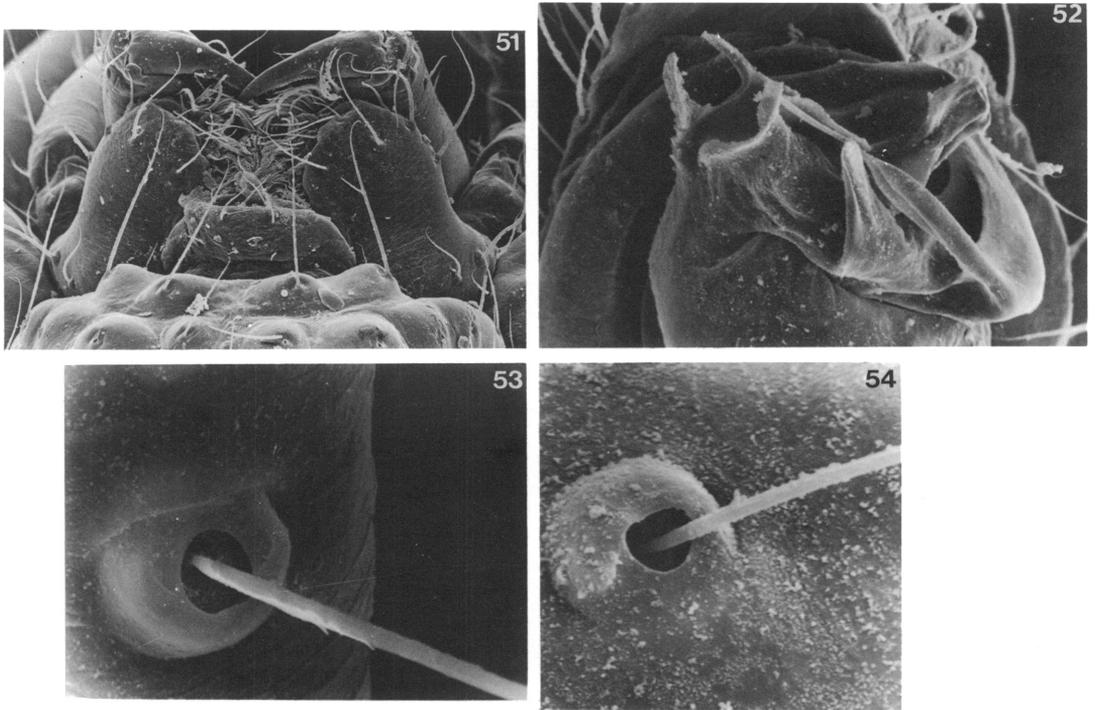
Figs. 48–50. *Meringa hinaka*, new species. 48. Female sternum and mouthparts, ventral view. 49. Male chelicera, medial view. 50. Claws of male tarsus IV, lateral view.

strongly angled embolar base (fig. 79), female by the long, narrow receptacula (fig. 83).

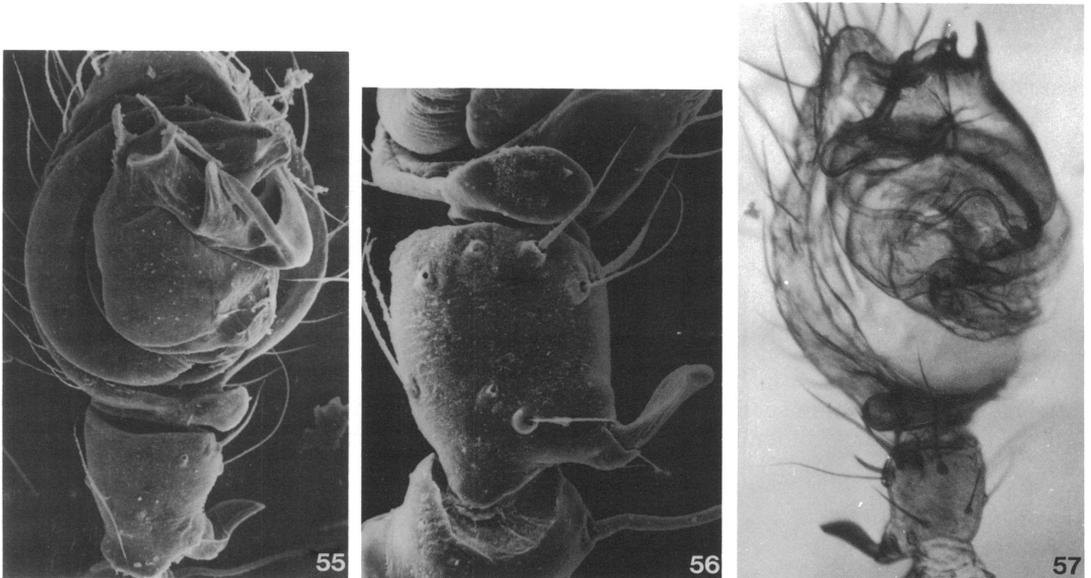
MALE: Total length 4.02. Carapace 1.32 long, 1.13 wide. Abdomen 2.65 long, 1.01 wide, 1.04 high. Leg lengths (legs incomplete): I 14.62, IV 11.28, femur II 3.34. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.03, AME-ALE 0.07, PME-PME 0.10, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.21, front width 0.15, back width 0.24. Clypeal height four

times AME diameter. Carapace pale brown but probably faded; abdomen faded but patterning probably as in *M. leith*. Palp 1.21 long, similar to that of *M. leith* but tibia with distal macroseta abutting paracymbium not distally attenuated (fig. 81) and embolar base strongly angled (fig. 79, 80).

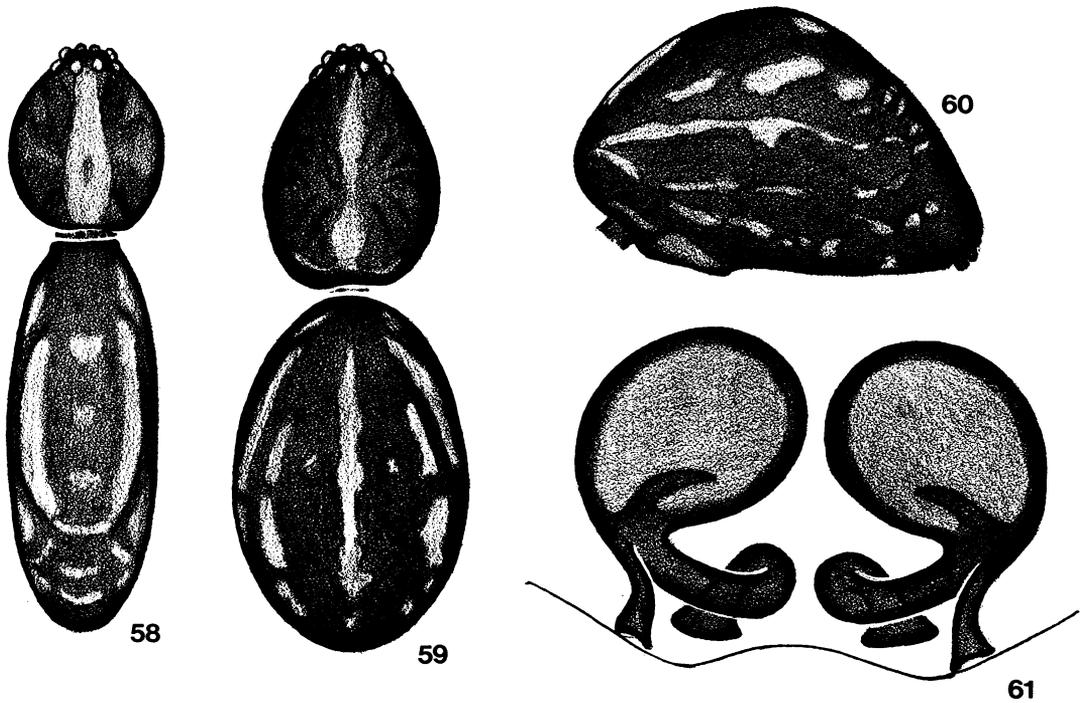
FEMALE: A single female *Meringa* collected from Kamahi-Rata forest, Murderers Bay, Big South Cape Island (Aug. 28, 1964; P. M. Johns; OMD) may belong to this species but



Figs. 51–54. *Meringa hinaka*, new species. 51. Mouthparts of female, ventral view. 52. Embolar region of left male palp, ventral view. 53. Trichobothrium from tibia I, dorsal view. 54. Trichobothrium from male palpal tibia, dorsal view.



Figs. 55–57. *Meringa hinaka*, new species. 55. Left male palp, ventral view. 56. Tibia and paracymbium of left male palp, ventral view. 57. Right male palp, ventral view, cleared to show course of sperm duct.



Figs. 58–61. *Meringa centralis*, new species. 58. Male, dorsal view. 59. Female, dorsal view. 60. Female, lateral view. 61. Epigynum, dorsal view.

is damaged and the eye interdistances are somewhat different. Total length 2.56. Carapace 1.01 long, 0.95 wide. Abdomen 1.68 long, 0.97 wide, 1.01 high. Femoral lengths: I 3.59, II 2.01, III 1.58, IV 2.58. Eye sizes and interdistances: AME 0.04, ALE 0.08, PME 0.08, PLE 0.08; AME-AME 0.04, AME-ALE 0.04, PME-PME 0.10, PME-PLE 0.03, ALE-PLE 0.02; MOQ length 0.18, front width 0.12, back width 0.26. Clypeal height 3.5 times AME diameter. Paired receptacula long, narrow, longitudinally oriented; intromittent ducts slightly convoluted (fig. 83), shorter than in *M. leith*.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Big South Cape Island, off Stewart Island, southern New Zealand.

Meringa nelson Forster,
new species
Figures 84, 85

TYPE: Female holotype taken from moss on the floor of a *Nothofagus* forest at Donald

Creek, Nelson, South Island, New Zealand (May 20, 1979; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species, known only from the female, is characterized by the coiled intromittent ducts (fig. 85).

MALE: Unknown.

FEMALE: Total length 2.02. Carapace 0.79 long, 0.69 wide. Abdomen 1.32 long, 0.88 wide. Leg lengths: I 5.23, II 4.79, III 3.47, IV 5.10. Eye sizes and interdistances: AME 0.04, ALE 0.04, PME 0.06, PLE 0.07; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.08, PME-PLE 0.04, ALE-PLE 0.02; MOQ length 0.16, front width 0.11, back width 0.20. Clypeal height four times AME diameter. Carapace dark with weak pattern but no pale median area (fig. 84); abdomen patterned as in figure 84. Paired receptacula tiny; intromittent ducts coiled (fig. 85).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Nelson, South Island, New Zealand.



Figs. 62, 63. *Meringa centralis*, new species, left male palp, prolateral and ventral views; note retrolateral cymbial incision in prolateral view.

***Meringa conway* Forster,
new species**

Figures 86, 87

TYPE: Female holotype taken in leaf litter in a *Nothofagus* forest at Okaratahi Bridge, north of Conway River, Marlborough, South Island, New Zealand (Sept. 22, 1967; C. L. Wilton), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species seems closely related to *M. nelson* but can be separated by the pale patch on the carapace (fig. 86) and the shorter intromittent ducts (fig. 87).

MALE: Unknown.

FEMALE: Total length 2.10. Carapace 0.82 long, 0.69 wide. Abdomen 1.32 long, 0.95 wide. Leg lengths: I 8.00, II 5.17, III 3.65, IV 5.48. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.06, PLE 0.06; AME-AME

0.03, AME-ALE 0.04, PME-PME 0.07, PME-
PLE 0.04, ALE-PLE 0.02; MOQ length 0.16,
front width 0.11, back width 0.19. Clypeal
height four times AME diameter. Carapace
with distinct pale patch near thoracic groove
(fig. 86); abdomen patterned as in figure 86.
Paired receptacula tiny, as in *M. nelson* but
convoluted intromittent ducts shorter than
in that species (fig. 87).

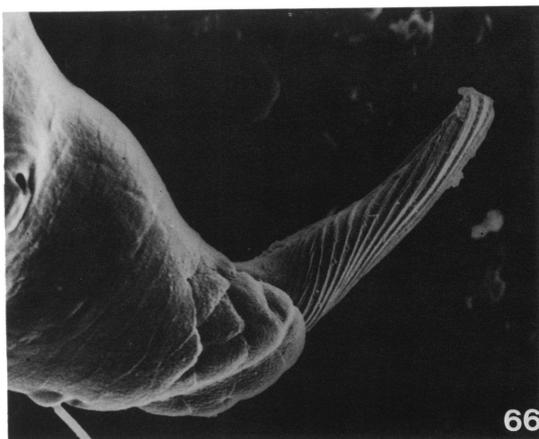
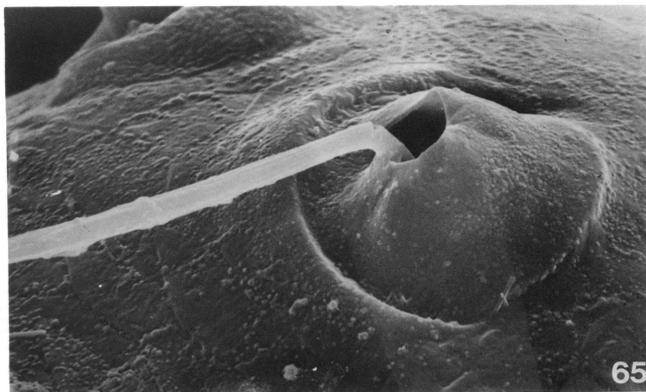
OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Marlborough, South Island, New Zealand.

***Meringa borealis* Forster,
new species**

Figures 88, 89, 91-94

TYPES: Female holotype taken in litter at Okehu, Maxwell, North Island, New Zealand (Mar. 20, 1969; C. L. Wilton, R. R. Forster), and male allotype taken under log at Vinegar



Figs. 64–66. *Meringa centralis*, new species. 64. Tibia and paracymbium of left male palp, retrolateral view. 65. Trichobothrium from male palpal tibia, dorsal view. 66. Basal macroseta on male palpal tibia, retrolateral view.

Hill Reserve, Manawatu, North Island, New Zealand (Dec. 12, 1948; R. R. Forster), deposited in OMD.

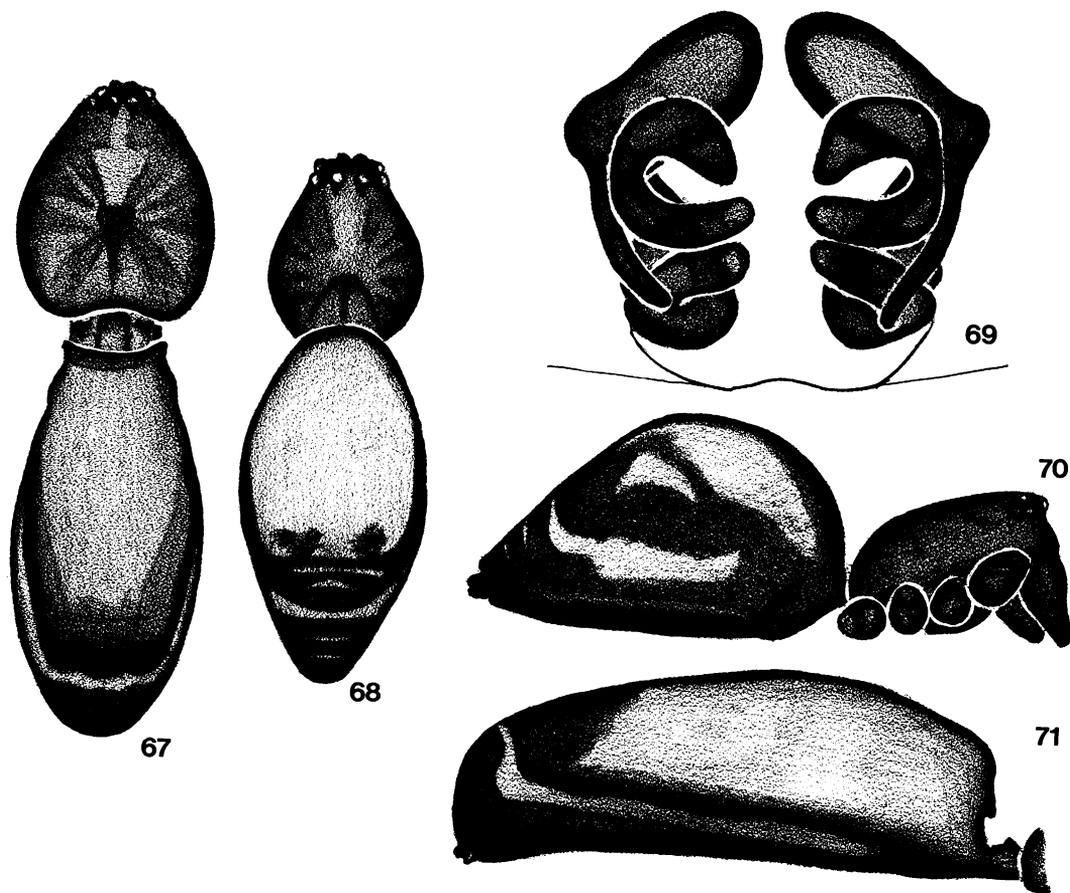
ETYMOLOGY: The specific name refers to the restriction of the species to the North Island.

DIAGNOSIS: Males can be recognized by the basally thickened basal macroseta on the palpal tibia (figs. 91, 92), females by the anteromedially thickened intromittent ducts (fig. 89).

MALE: Total length 3.36. Carapace 1.26 long, 0.82 wide. Abdomen 2.08 long, 0.82 wide. Leg lengths: I 13.55, II 8.00, III 5.61, IV 7.81. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.08, PME-PLE 0.04, ALE-PLE 0.02; MOQ length

0.13, front width 0.11, back width 0.22. Clypeal height five times AME diameter. Coloration uniformly pale yellow-brown (probably faded). Palp 1.12 long, with embolus well developed (fig. 91) but shorter than in *M. leith* or *M. australis*, tibia with strong proximodorsal macroseta (fig. 94).

FEMALE: Total length 2.00. Carapace 0.76 long, 0.69 wide. Abdomen 1.26 long, 0.76 wide. Leg lengths: I 8.38, II 5.42, III 3.53, IV 5.48. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.11, PME-PLE 0.04, ALE-PLE 0.02; MOQ length 0.14, front width 0.09, back width 0.23. Clypeal height three times AME diameter. Carapace heavily shaded with black but with distinct pale band down midsurface (fig. 88); abdo-



Figs. 67–71. *Meringa leith*, new species. 67. Male, dorsal view. 68. Female, dorsal view. 69. Epigynum, dorsal view. 70. Female, lateral view. 71. Male abdomen, lateral view.

men patterned as in figure 88. Paired receptacula long, narrow; intromittent ducts thickened anteromedially (fig. 89).

VARIATION: Males from the Wellington district have a shorter tibial macroseta (figs. 92, 93) and may represent a further species, although the genitalia of females collected from this area appear similar to that of the holotype.

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Taranaki:* Englewood, Aug. 29, 1960, forest (B. J. Marples, OMD), 1♀; Mount Egmont, Mar. 21, 1961, elev. 3505 ft, moss in forest (R. R. Forster, C. L. Wilton, OMD), 1♀. *Wellington:* Karaka Bay, Nov. 19, 1962, leaf litter (J. H. McMillan, OMD), 1♀; Karori, Jan. 3, 1947 (R. R. Forster, OMD), 1♂; Soames Island, Oct. 19, 1954 (R. K. Dell,

NMW), 1♀. *Wairarapa:* Mangarei, Aug. 3, 1947 (C. L. Wilton, OMD), 1♂.

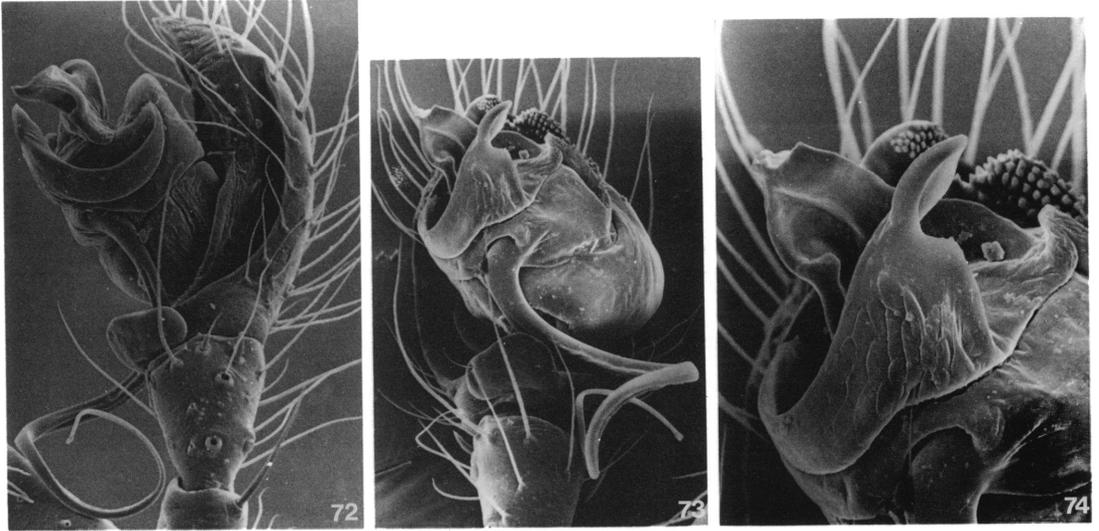
DISTRIBUTION: Known only from the North Island, New Zealand.

Meringa tetragyna Forster,
new species
Figure 90

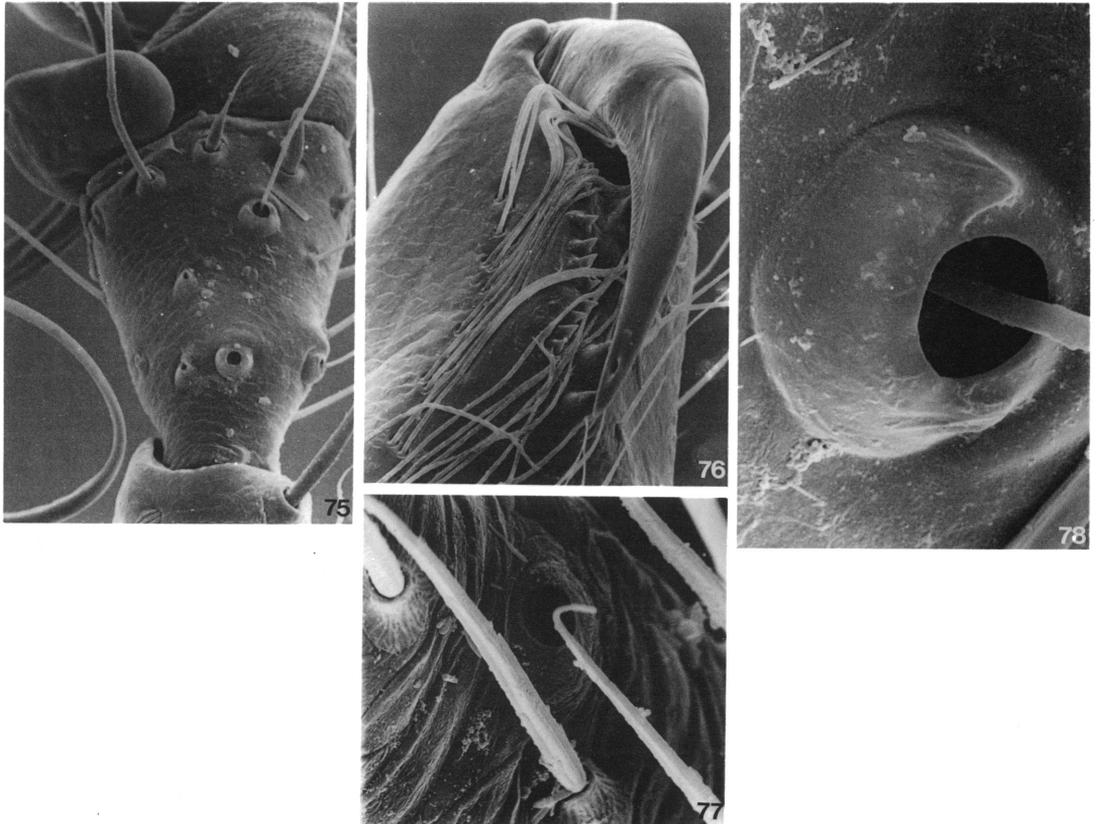
TYPES: Female holotype from Mangarei, Wairarapa, North Island, New Zealand (C. L. Wilton; July 25, 1945), deposited in OMD.

ETYMOLOGY: The specific name refers to the receptacula of the internal female genitalia.

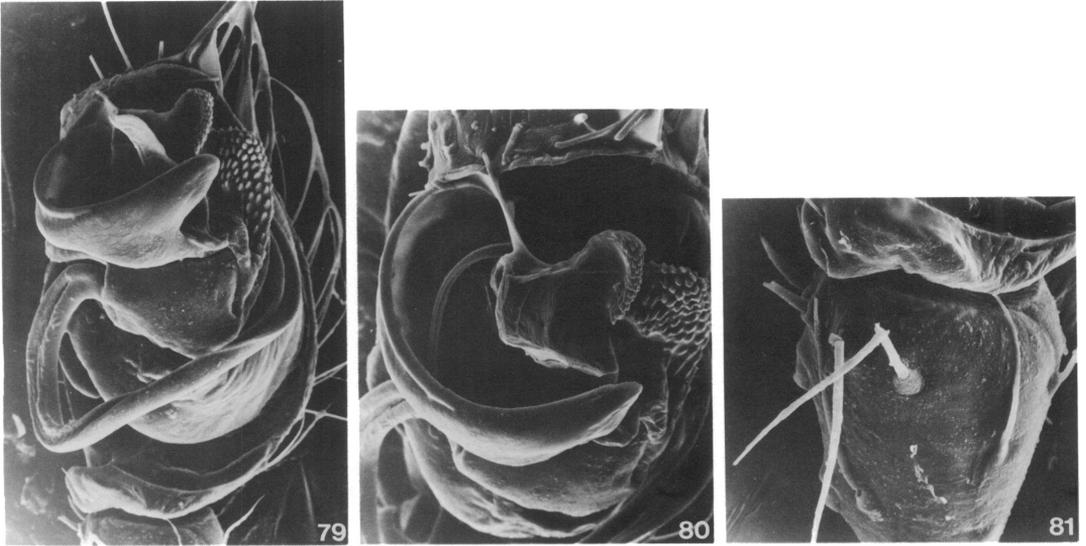
DIAGNOSIS: This species can be distinguished easily from all others by the quad-



Figs. 72-74. *Meringa leith*, new species, male, retrolateral view of left palp and ventral views of right palp.



Figs. 75-78. *Meringa leith*, new species. 75. Tibia of left male palp, retrolateral view, showing two distal macrosetae. 76. Chelicera, medial view. 77. Tarsal organ, dorsal view. 78. Trichobothrium, dorsal view.



Figs. 79-81. *Meringa australis*, new species, right male palp, ventral views.

ri-receptaculate internal female genitalia (fig. 90).

MALE: Unknown.

FEMALE: Total length 2.10. Carapace 0.88 long, 0.63 wide. Abdomen 1.26 long, 1.07 wide. Leg lengths: I 6.80, II 4.73, III 3.15, IV 5.04. Eye sizes and interdistances: AME 0.03, ALE 0.04, PME 0.04, PLE 0.04; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.06, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.09, front width 0.07, back width 0.10. Clypeal height more than three times AME diameter. Carapace brown with median pale patch, ab-

domen pale. Internal genitalia with four large receptacula (fig. 90); inner pair of receptacula probably representing expansion of intermittent ducts characteristic of all other *Meringa* species.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Wairarapa, North Island, New Zealand.

TUPUA PLATNICK, NEW GENUS

TYPE SPECIES: *Tupua bisetosa* Platnick, new species.



Figs. 82, 83. Epigynum, dorsal views. 82. *Meringa otago*, new species. 83. *M. australis*, new species.



Figs. 84–87. 84, 85. *Meringa nelson*, new species. 86, 87. *M. conway*, new species. 84, 86. Female, dorsal views. 85, 87. Epigynum, dorsal views.

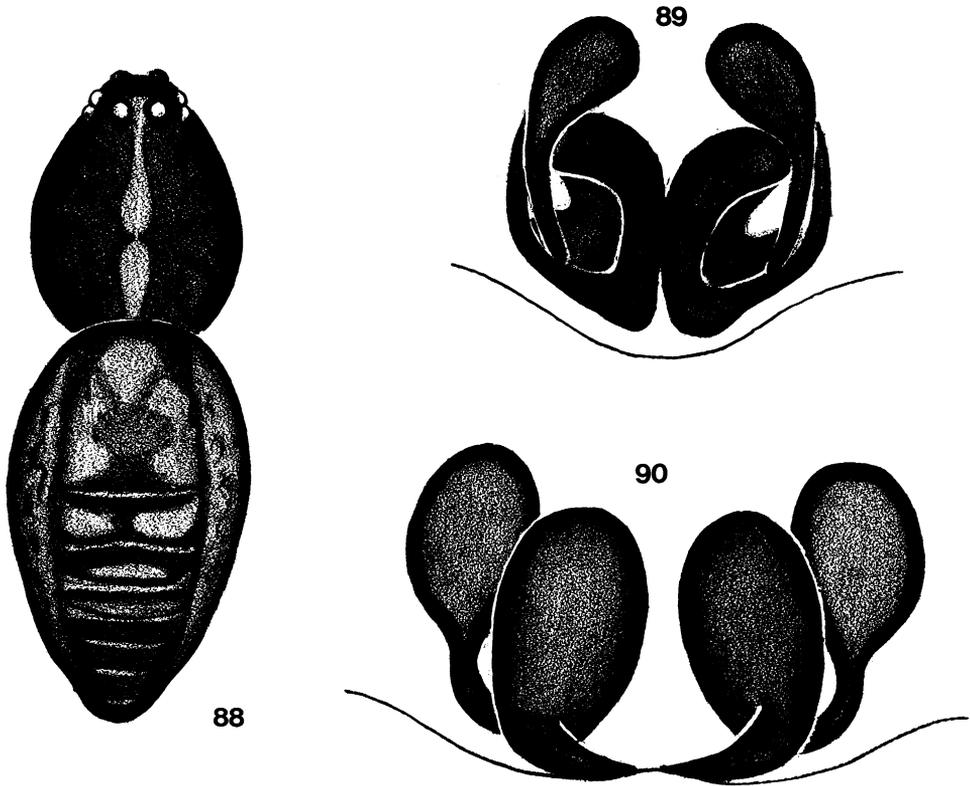
ETYMOLOGY: The generic name is an arbitrary combination of letters considered feminine in gender.

DIAGNOSIS: Members of this genus resemble those of the Australian *Paratupua* in having a pair of anteriorly directed macrosetae along the midline of the ocular area (figs. 95, 96, 98, 99), but differ in having a shorter palpal tibia in males (figs. 100–102) and looped but unconvoluted ducts in the internal female genitalia (figs. 104, 106, 114, 116).

DESCRIPTION: AME distinctly smaller than other eyes; MOQ wider behind than in front, almost as long as wide behind. Sternum about as wide as long, smooth, broadly clavate behind, with scattered, exceptionally long setae originating from pale areas. Pedicel with winglike anterior sclerotizations covering sides of dorsum and venter, and second,

transversely oriented, oval sclerite situated medially on ventral surface (fig. 97). Female abdomen pyriform; male abdomen elongate, more than twice as long as wide, drooping posteriorly, anterodorsal surface with broad, collarlike, transverse, smoothly sclerotized ridge. Leg formula 1423 or 1243. Patella and tibia of male palp each with short, thickened but nonspiniiform macroseta on distodorsal surface; embolus elongate, curved; paracymbium a small, retrolaterally projecting lobe. External epigynum inconspicuous, openings situated posteriorly; intromittent ducts folded or coiled but not convoluted.

DISTRIBUTION: Known only from Tasmania, where both surface and cave populations occur; three species have been found in caves, and at least one is probably an obligate cave dweller.



Figs. 88–90. 88, 89. *Meringa borealis*, new species. 90. *M. tetragyna*, new species. 88. Female, dorsal views. 89, 90. Epigynum, dorsal views.

Tupua bisetosa Platnick,
new species
Figures 95–104

TYPES: Male holotype and female allotype taken under logs in a myrtle forest in Mount Wellington National Park, Tasmania, Australia (Feb. 28, 1952; V. V. Hickman), deposited in AMS.

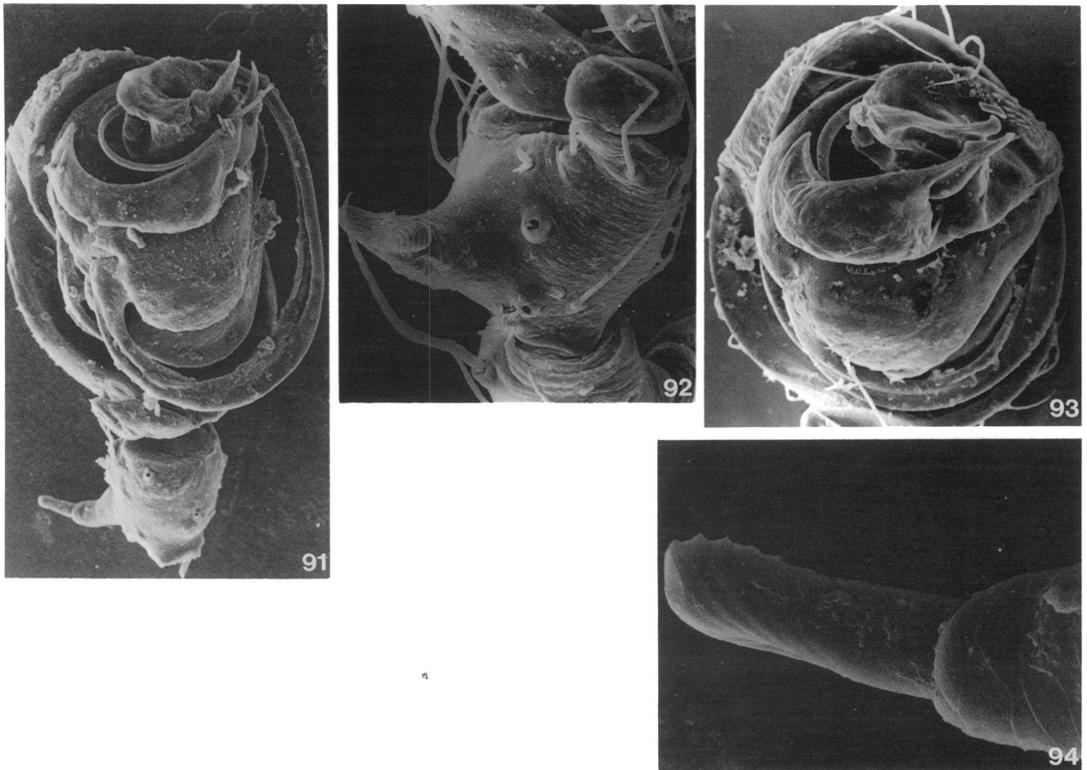
ETYMOLOGY: The specific name refers to the two ocular macrosetae.

DIAGNOSIS: The distally squared prolateral apophysis on the male palp (fig. 100) and the elongate, obliquely oriented female receptacula on anteriorly widened ducts (fig. 104) are diagnostic.

MALE: Total length 3.86. Carapace 1.20 long, 0.98 wide. Abdomen 2.63 long, 1.01 wide. Leg lengths: I 11.63, II 8.06, III 6.00, IV 7.99. Eye sizes and interdistances: AME 0.05, ALE 0.06, PME 0.06, PLE 0.07; AME-

AME 0.05, AME-ALE 0.07, PME-PME 0.12, PME-PLE 0.07, ALE-PLE 0.03; MOQ length 0.23, front width 0.16, back width 0.25. Clypeal height almost six times AME diameter. Carapace dusky brown with posterior portion of pars cephalica pale yellow; abdomen gray with lateral and median longitudinal white stripes and two transverse posterior white stripes. Palp 0.90 long, patella and tibia each with single, subdistal, short, thickened macroseta; bulb with prolateral apophysis distally squared, median apophysis broadly triangular (figs. 100–102).

FEMALE: Total length 2.51. Carapace 0.92 long, 0.84 wide. Abdomen 1.58 long, 1.26 wide. Leg lengths: I 8.33, II 5.70, III 4.50, IV 5.72. Eye sizes and interdistances: AME 0.05, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.04, AME-ALE 0.06, PME-PME 0.09, PME-PLE 0.06, ALE-PLE 0.02; MOQ length 0.18, front width 0.15, back width 0.21. Clypeal



Figs. 91–94. *Meringa borealis*, new species, male. **91.** Right palp, ventral view, specimen from Vinegar Hill Reserve. **92, 93.** Right palpal tibia and tarsus, ventral views, specimen from Mangarei. **94.** Basal tibial macroseta, ventral view, specimen from Vinegar Hill Reserve.

height four times AME diameter. Coloration as in male except median longitudinal abdominal stripe reduced to small spot and more anterior transverse stripe broken at middle. Anterior epigynal margin produced posteriorly along midline; receptacula obliquely oriented, anterior loops of intromittent ducts wider, more heavily sclerotized than posterior loops (figs. 103, 104).

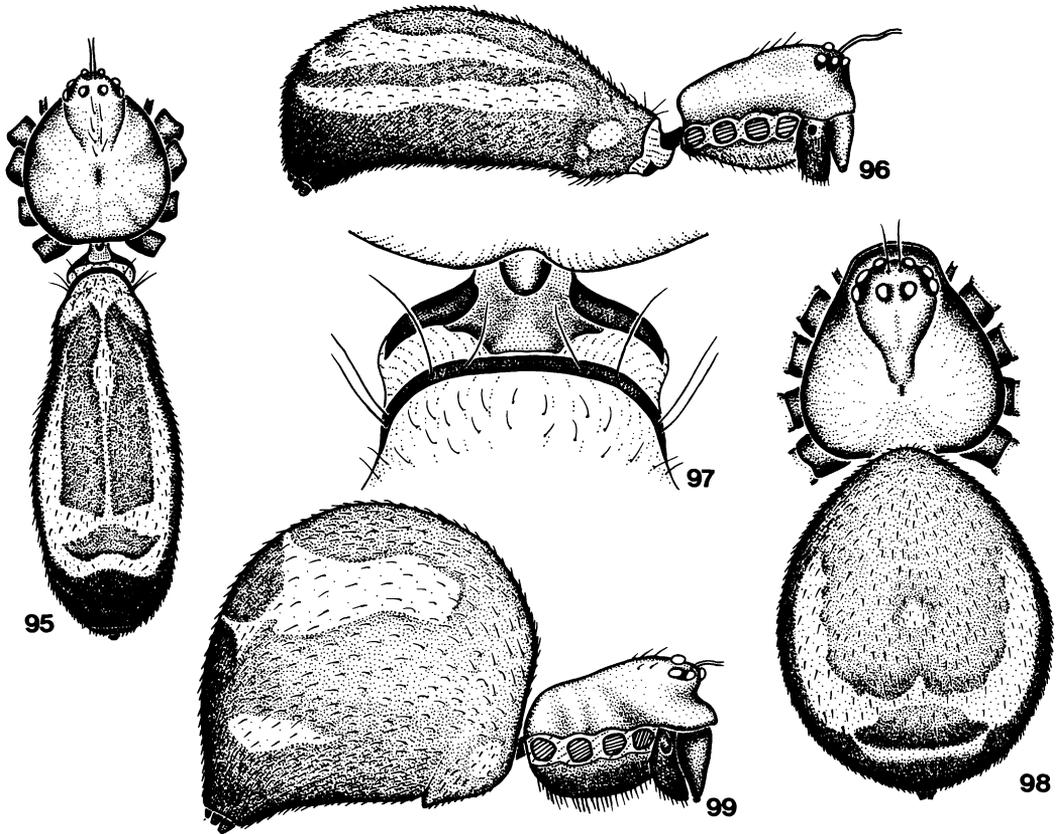
OTHER MATERIAL EXAMINED: AUSTRALIA: **Tasmania:** Cascades, Jan. 17, 1934, in moss (V. V. Hickman, VVH), 1♀; Fern Tree, near Hobart, Sept. 28, 1957, in debris under ferns (V. V. Hickman, VVH), 1♀; King George V Cave, Hastings, Jan. 8, 1973, in twilight zone (A. Goede, AMS), 3♂; Lake Dobson Road, Mount Field National Park, Feb. 4, 1980, elev. 610 m, pyrethrin spraying of beech bark (A. Newton, M. Thayer, AMNH), 1♂, Jan. 30–Feb. 5, 1980, elev. 710 m, pitfall trap, beech-eucalypt forest (A. Newton, M.

Thayer, AMNH), 1♂; Mount Wellington National Park, Sept. 29, 1951, under logs (J. L. and V. V. Hickman, VVH), 2♂, Jan. 20, 1964, under rotten log (J. L. Hickman, VVH), 2♂, 1♀; Sandfly Colliery, Kaoota, Oct. 31, 1968, in twilight zone (T. and A. Goede, AMS), 1♂; 6 km E Strahan, Apr. 30, 1987, rainforest, pyrethrin fogging of king ferns (N. I. Platnick, R. J. Raven, T. Churchill, AMNH), 2♂; 0–10 km W Strathgordon, just N Mount Sprent, Apr. 26, 1987, elev. 290 m (N. I. Platnick, R. J. Raven, T. Churchill, AMNH), 2♂, 2♀.

DISTRIBUTION: Known only from southern Tasmania.

Tupua raveni Platnick,
new species
Figures 105–109

TYPES: Male holotype and female allotype taken at an elevation of 1000 m in Waldheim



Figs. 95–99. *Tupua bisetosa*, new species. 95. Male, dorsal view. 96. Male, lateral view. 97. Male, pedicel and anterior abdominal region, dorsal view. 98. Female, dorsal view. 99. Female, lateral view.

Forest, Cradle Mountain National Park, Tasmania, Australia (Jan. 31–Feb. 4, 1987; R. J. Raven, J. A. Gallon), deposited in QMB.

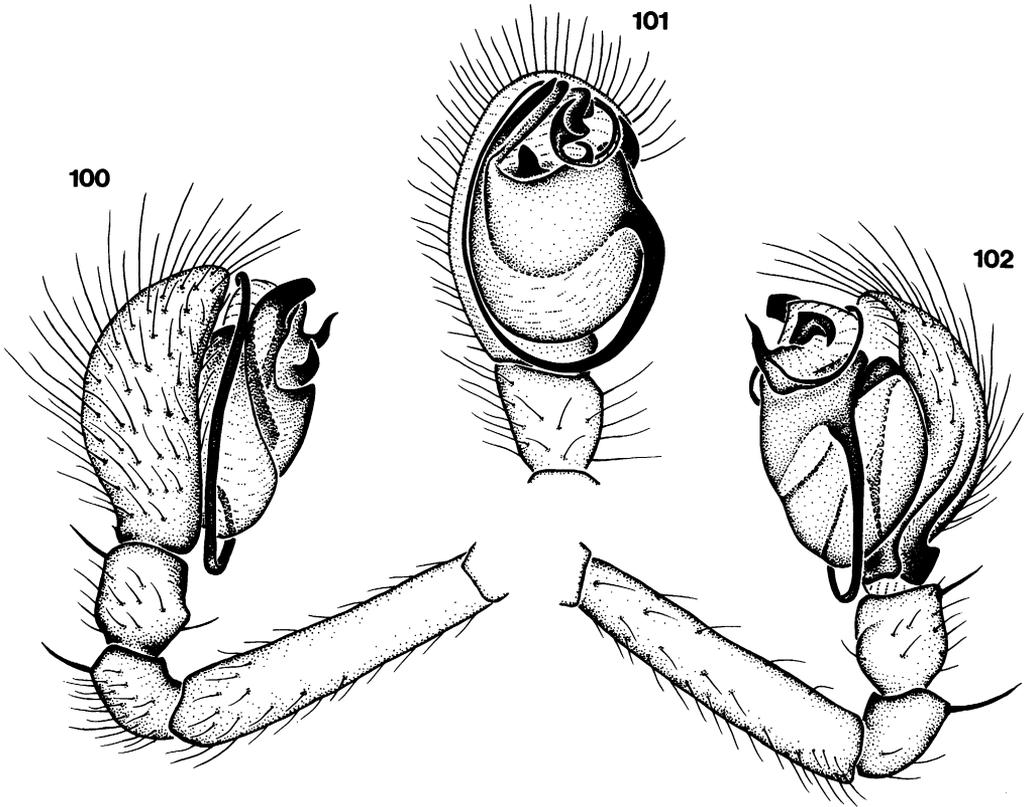
ETYMOLOGY: The specific name is a patronym in honor of one of the collectors of the type.

DIAGNOSIS: The basal projection on the prolateral apophysis of the male palp (figs. 107, 108) and the elongate, longitudinally oriented female receptacula (fig. 104) are diagnostic.

MALE: Total length 4.01. Carapace 1.20 long, 0.98 wide. Abdomen 2.74 long, 0.99 wide. Leg lengths: I 13.17, II 8.96, III 6.53, IV 8.93. Eye sizes and interdistances: AME 0.05, ALE 0.05, PME 0.06, PLE 0.07; AME-AME 0.06, AME-ALE 0.09, PME-PME 0.12, PME-PLE 0.07, ALE-PLE 0.02; MOQ length

0.22, front width 0.16, back width 0.23. Clypeal height almost six times AME diameter. Carapace dusky brown with paramedian pale patches on pars thoracica; abdomen gray with lateral longitudinal white stripes on posterior two-thirds, connected by four transverse posterior white stripes. Palp 0.90 long, patella and tibia each with single, subdistal, short, thickened macroseta, tibial one stronger; bulb with prolateral apophysis bearing basal protuberance, median apophysis almost semicircular (figs. 107–109).

FEMALE: Total length 2.51. Carapace 0.90 long, 0.76 wide. Abdomen 1.61 long, 1.17 wide. Leg lengths: I 8.67, II 5.81, III 4.39, IV 5.85. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.05, PLE 0.06; AME-AME 0.05, AME-ALE 0.06, PME-PME 0.09, PME-



Figs. 100-102. *Tupua bisetosa*, new species, left male palp, prolateral, ventral, and retrolateral views.

PLE 0.06, ALE-PLE 0.02; MOQ length 0.15, front width 0.12, back width 0.19. Clypeal height five times AME diameter. Coloration as in male. Anterior epigynal margin broadly produced posteriorly along midline; receptacula longitudinally oriented, anterior loops of intromittent ducts wider, more heavily sclerotized than posterior loops (figs. 105, 106).

OTHER MATERIAL EXAMINED: AUSTRALIA: **Tasmania:** Hogarth Falls, near Strahan, Jan. 18, 1981, litter (N. Poulter, AMS), 1♂; Liffey Falls, May 14, 1953, in moss (V. V. Hickman, VVH), 1♂; Waldheim Forest, Cradle Mountain National Park, Jan. 31-Feb. 4, 1987, elev. 1000 m (R. J. Raven, J. A. Gallon, QMB), 3♂, 2♀; southwestern Tasmania (42°43'S, 145°45'E), Jan. 20, 1977 (C. Howard, C. Johnson, VVH), 1♂.

DISTRIBUTION: Known only from western Tasmania.

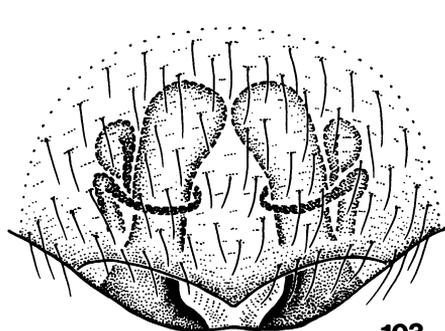
Tupua cavernicola Platnick,
new species,
Figures 110-114

TYPES: Male holotype and female allotype from Col-in-Cavern, Mount Anne, Tasmania, Australia (Jan. 24, 1987; S. Eberhard), deposited in AMS.

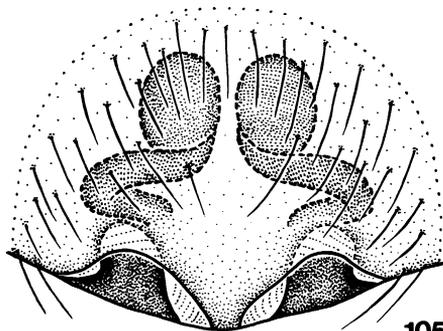
ETYMOLOGY: The specific name refers to the habitat.

DIAGNOSIS: The pale coloration of this cave species separates it from the preceding two species, but the male and female genitalia (figs. 110-114) resemble those of the surface-dwelling species more than those of the highly autapomorphic *T. troglodytes*.

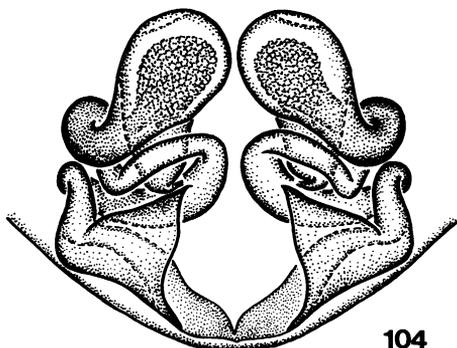
MALE: Total length 2.33. Carapace 0.75 long, 0.58 wide. Abdomen 1.46 long, 0.94 wide. Leg lengths: I 10.61, II 7.58, III 5.44, IV 6.79. Eye sizes and interdistances: AME 0.05, ALE 0.04, PME 0.05, PLE 0.05; AME-



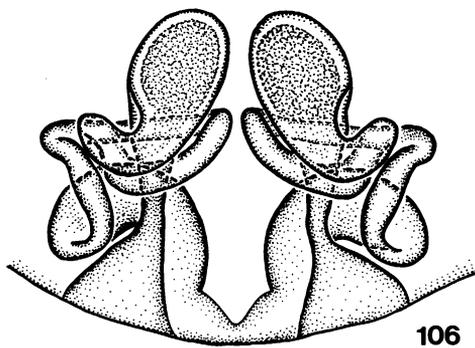
103



105



104



106

Figs. 103–106. 103, 104. *Tupua bisetosa*, new species. 105, 106. *T. raveni*, new species. 103, 105. Epigynum, ventral views. 104, 106. Epigynum, dorsal views.

AME 0.03, AME-ALE 0.05, PME-PME 0.12, PME-PLE 0.05, ALE-PLE 0.02; MOQ length 0.14, front width 0.13, back width 0.16. Clypeal height almost five times AME diameter. Carapace pale yellow with posterior portion of pars cephalica lightest; abdomen dirty white. Palp 0.79 long, patella and tibia each with single, subdistal, short, thickened macroseta, tibial one stronger; bulb with pro-lateral apophysis folded distally, median apophysis an excavated hook (figs. 110–112).

FEMALE: Total length 1.72. Carapace 0.71 long, 0.56 wide. Abdomen 0.90 long, 0.77 wide. Leg lengths: I 7.88, II 5.91, III 4.22, IV 5.40. Eye sizes and interdistances: AME 0.04, ALE 0.05, PME 0.04, PLE 0.05; AME-AME 0.03, AME-ALE 0.05, PME-PME 0.09, PME-PLE 0.05, ALE-PLE 0.02; MOQ length 0.13, front width 0.11, back width 0.14. Clypeal height almost four times AME diameter. Coloration as in male. Epigynum with distinct

lateral openings; receptacula curved, on narrow intromittent ducts (figs. 113, 114).

OTHER MATERIAL EXAMINED: AUSTRALIA: Tasmania: Deep Thought, Mount Anne, Jan. 13, 1987, ca. 25 m from stream at depth of 170 m (S. Eberhard, AMS), 1♂, 4♀.

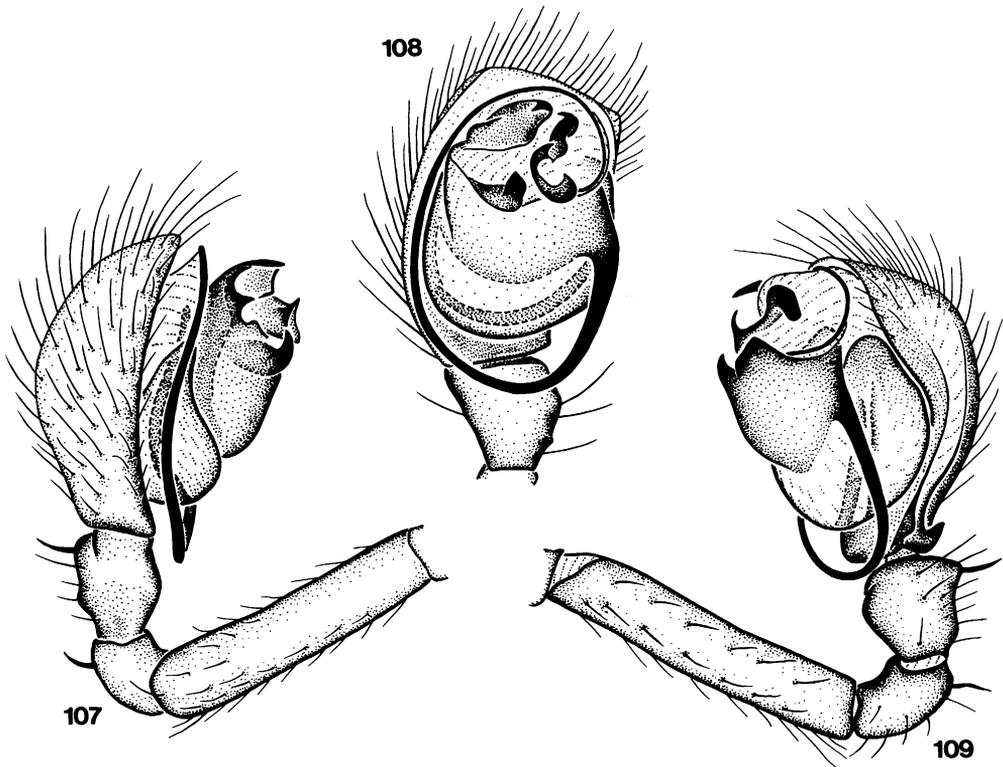
DISTRIBUTION: Known only from caves on Mount Anne in southcentral Tasmania.

Tupua troglodytes Platnick,
new species
Figures 115–119

TYPES: Male holotype and female allotype from Granite Pot, Florentine Valley, Tasmania, Australia (Jan. 26, 1986; S. Eberhard), deposited in AMS.

ETYMOLOGY: The specific name refers to the status of the species as a probably obligate cave-dweller.

DIAGNOSIS: The widened embolus of males



Figs. 107-109. *Tupua raveni*, new species, left male palp, prolateral, ventral, and retrolateral views.

(figs. 117-119) and coiled intromittent ducts of females (fig. 116) are diagnostic, as is the complete loss of eye pigment.

MALE: Total length 2.03. Carapace 0.81 long, 0.75 wide. Abdomen 1.24 long, 0.79 wide. Leg lengths: I 8.59, II 6.45, III 4.95, IV 6.68. Eye sizes and interdistances: AME 0.04, ALE 0.04, PME 0.04, PLE 0.05; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.07, PME-PLE 0.06, ALE-PLE 0.02; MOQ length 0.11, front width 0.11, back width 0.15. Clypeal height almost five times AME diameter. Carapace pale yellow with posterior portion of pars cephalica lightest; abdomen dirty white. Palp 1.00 long, patella and tibia each with single, subdistal, short, thickened macroseta, tibial one much stronger; distoventral surface of tibia excavated, forming crest opposing paracymbium; bulb with greatly widened embolus and recessed median apophysis (figs. 117-119).

FEMALE: Total length 1.69. Carapace 0.74 long, 0.69 wide. Abdomen 0.89 long, 0.75

wide. Leg lengths: I 5.14, II 4.88, III 3.90, IV 5.44. Eye sizes and interdistances: AME 0.04, ALE 0.04, PME 0.03, PLE 0.03; AME-AME 0.03, AME-ALE 0.05, PME-PME 0.07, PME-PLE 0.05, ALE-PLE 0.02; MOQ length 0.09, front width 0.11, back width 0.13. Clypeal height almost four times AME diameter. Coloration as in male. Epigynum with tiny posteromedian openings; receptacula round, on coiled intromittent ducts (figs. 115, 116).

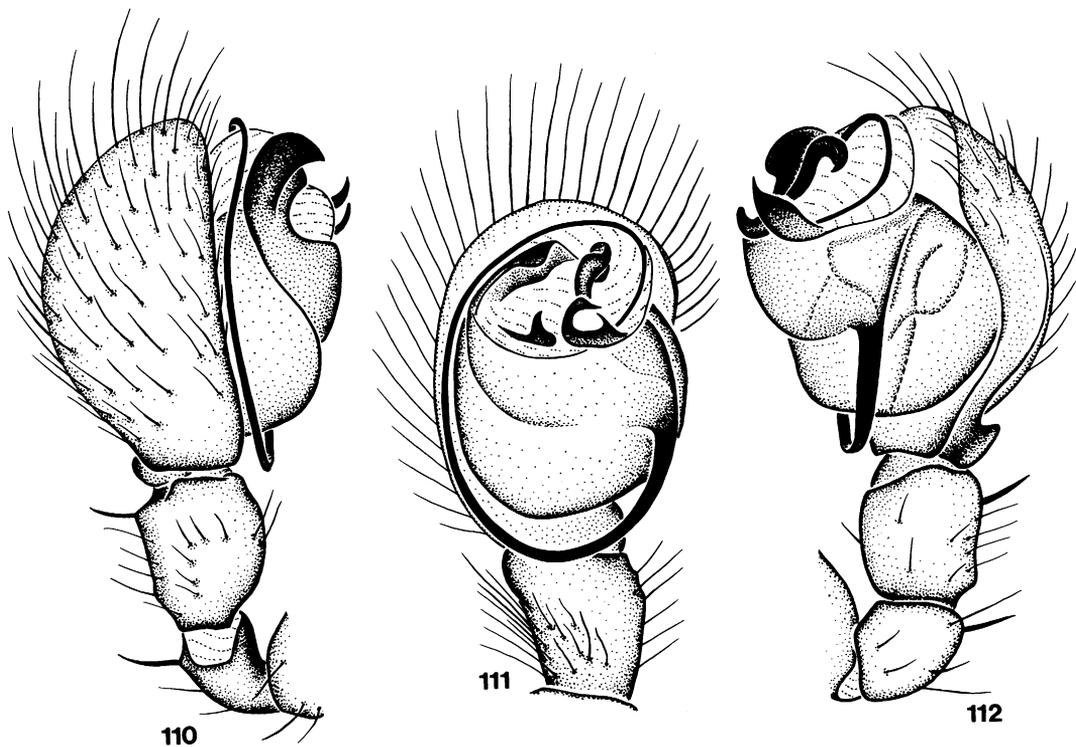
OTHER MATERIAL EXAMINED: AUSTRALIA: **Tasmania:** Cueva Blanca cave, Precipitous Bluff, Mar. 31, 1986 (S. Eberhard, AMS), 1♀; Granite Pot, Florentine Valley, Jan. 26, 1986 (S. Eberhard, AMS), 1♂.

DISTRIBUTION: Known only from two caves in Tasmania.

PARATUPA PLATNICK, NEW GENUS

TYPE SPECIES: *Paratupua grayi* Platnick, new species.

ETYMOLOGY: The generic name is an ar-



Figs. 110-112. *Tupua cavernicola*, new species, left male palp, prolateral, ventral, and retrolateral views.

bitrary combination of letters considered feminine in gender.

DIAGNOSIS: Members of this genus resemble those of the Tasmanian *Tupua* in having a pair of anteriorly directed macrosetae along the midline of the ocular area (figs. 120, 121, 123, 124), but differ in having anterolateral tubercles on the chelicerae and a longer palpal tibia in males (figs. 125-127) and convoluted ducts in the internal female genitalia (fig. 129).

DESCRIPTION: AME distinctly smaller than other eyes; MOQ wider behind than in front and than long. Sternum slightly wider than long, smooth, broadly clavate behind, with scattered, exceptionally long setae originating from pale areas, fused to labium. Pedicel with winglike anterior sclerotizing covering dorsum and second, transversely oriented, u-shaped sclerite situated medially on dorsal surface (fig. 122). Female abdomen pyriform; male abdomen elongate, more than twice as long as wide, drooping posteriorly, antero-dorsal surface with long, collarlike, trans-

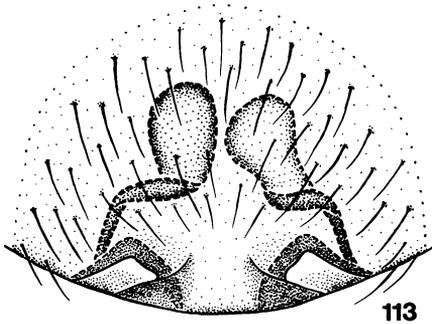
verse, smoothly sclerotized ridge. Leg formula 1423 or 1243. Patella of male palp with very short distodorsal macroseta, tibia elongate with curved, thickened macroseta on distodorsal surface; embolus elongate, curved; paracymbium a small, retrolaterally projecting lobe. External epigynum inconspicuous, openings situated posteriorly; intromittent ducts convoluted.

DISTRIBUTION: Known only from Victoria, Australia.

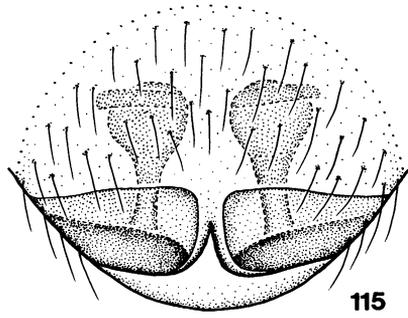
Paratupua grayi Platnick,
new species
Figures 120-129

TYPE: Male holotype taken from a pitfall trap in litter of a montane ash-beech forest in the Otway Range, 5 km S of Wyelangta, Victoria, Australia (Jan. 24, 1979; A. Frazer), deposited in AMS.

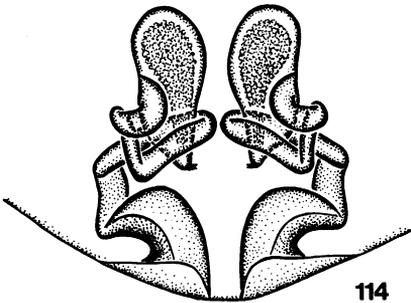
ETYMOLOGY: The specific name is a patronym in honor of Dr. M. R. Gray, who



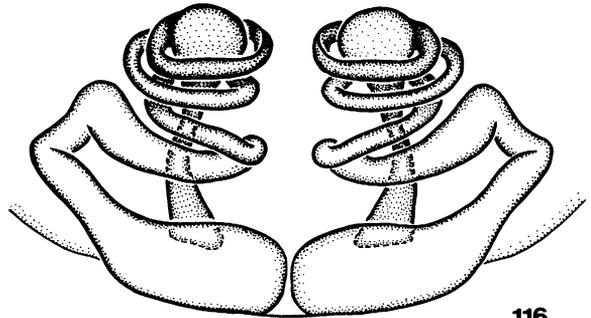
113



115



114



116

Figs. 113–116. 113, 114. *Tupua cavernicola*, new species. 115, 116. *Tupua troglodytes*, new species. 113, 115. Epigynum, ventral views. 114, 116. Epigynum, dorsal views.

made the only known specimens of the genus available for study.

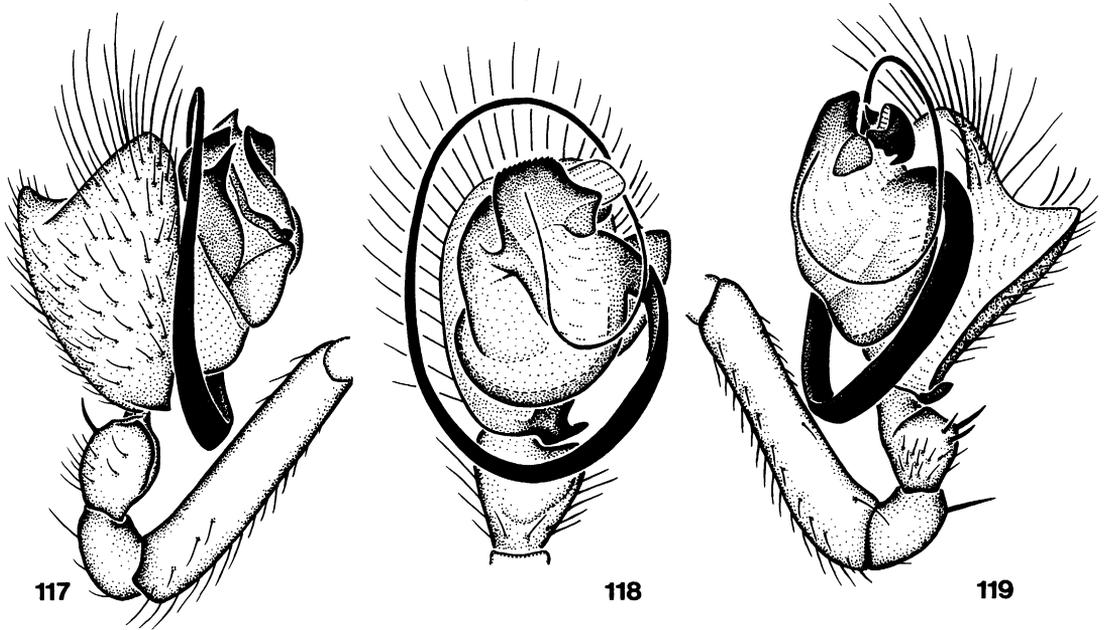
DIAGNOSIS: With the characters of the genus, including an elongate male palpal tibia (figs. 125–127) and convoluted intromittent ducts in the internal female genitalia (fig. 129).

MALE: Total length 4.50. Carapace 1.45 long, 1.24 wide. Abdomen 2.93 long, 1.23 wide. Leg lengths: I (femur only) 6.00, II 11.66, III 8.14, IV 12.98. Eye sizes and interdistances: AME 0.09, ALE 0.09, PME 0.08, PLE 0.10; AME-AME 0.05, AME-ALE 0.09, PME-PME 0.16, PME-PLE 0.12, ALE-PLE 0.06; MOQ length 0.26, front width 0.23, back width 0.28. Clypeal height over three times AME diameter. Carapace brownish orange except posterior one-third of pars cephalica yellow; abdomen grayish brown, with two lateral longitudinal white stripes. Palp 1.28 long, patella, tibia, and tarsus each with single, subdistal, short, thickened macroseta, tibial one stronger than patellar, curved, tarsal one elongate; embolus accompanied by

two spinous prolateral processes (figs. 125–127).

FEMALE: Total length 3.30. Carapace 1.23 long, 0.96 wide. Abdomen 2.23 long, 1.22 wide. Leg lengths: I 12.19, II 7.65, III 6.19, IV 9.64. Eye sizes and interdistances: AME 0.08, ALE 0.08, PME 0.08, PLE 0.09; AME-AME 0.04, AME-ALE 0.05, PME-PME 0.09, PME-PLE 0.06, ALE-PLE 0.03; MOQ length 0.25, front width 0.20, back width 0.25. Clypeal height about three times AME diameter. Coloration as in male, with lateral abdominal stripes connected posteriorly. Epigynum with tiny posterolateral openings; receptacula and ducts highly convoluted (figs. 128, 129).

OTHER MATERIAL EXAMINED: AUSTRALIA: **Victoria:** Alfred National Park, 19 km E Cann River, Mar. 23, 1978, in log on bank of creek, subtropical rainforest (M. Gray, C. Horseman, AMS), 1♀; Lavers Hill, Otway Range, Feb. 24, 1979, pitfall in litter, montane ash-beech forest (A. Frazer, AMS), 1♂;



Figs. 117-119. *Tupua troglodytes*, new species, left male palp, prolateral, ventral, and retrolateral views.

Strzelecki State Forest, 0.2 km E Traralgon on Grand Ridge Road, Mar. 26, 1978, in logs (M. Gray, C. Horseman, AMS), 1♀.

DISTRIBUTION: Known only from Victoria, Australia.

THE SUBFAMILY PAHORINAE

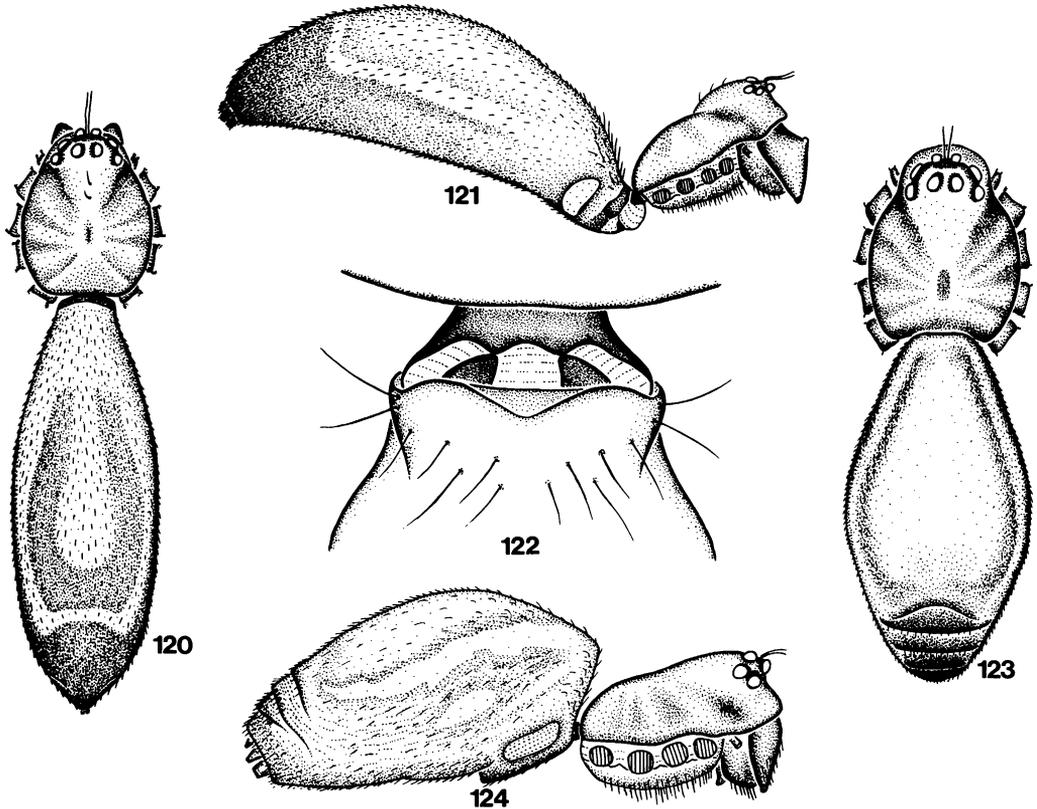
Two groups of small, long-legged, forest-dwelling spiders of enigmatic familial relationships have long been known from New Zealand. Six genera are recognized here, of which five belong to an apparently monophyletic group treated here as the subfamily Pahorinae. Of those five genera, only a single species has been previously described, as a linyphiid: *Cornicularia crinifrons* Urquhart (1891). That species was subsequently transferred to the theridiid genus *Synotaxus* by Simon (1894) and later moved to the linyphiid genus *Bolyphantes* by Dalmas (1917); none of these generic placements are defensible. Representatives of these genera were discussed by Forster and Forster (1973) in a popular work on New Zealand spiders, where they were tentatively placed in *Synotaxus*.

PAHORINAE FORSTER, NEW SUBFAMILY

TYPE GENUS: *Pahora*, new genus.

DIAGNOSIS: Members of this subfamily can be recognized by the stridulatory file on the anterodorsal surface of the male abdomen, which engages with a pick on the posterior margin of the carapace (figs. 135-136). The presence of secretory pores on the pars cephalica and clypeus of males (often associated with a raised setose area behind the AME, figs. 130-134), and of an excavated paracymbial area on the male palp (figs. 149, 155, 161, 171, 179) are also characteristic.

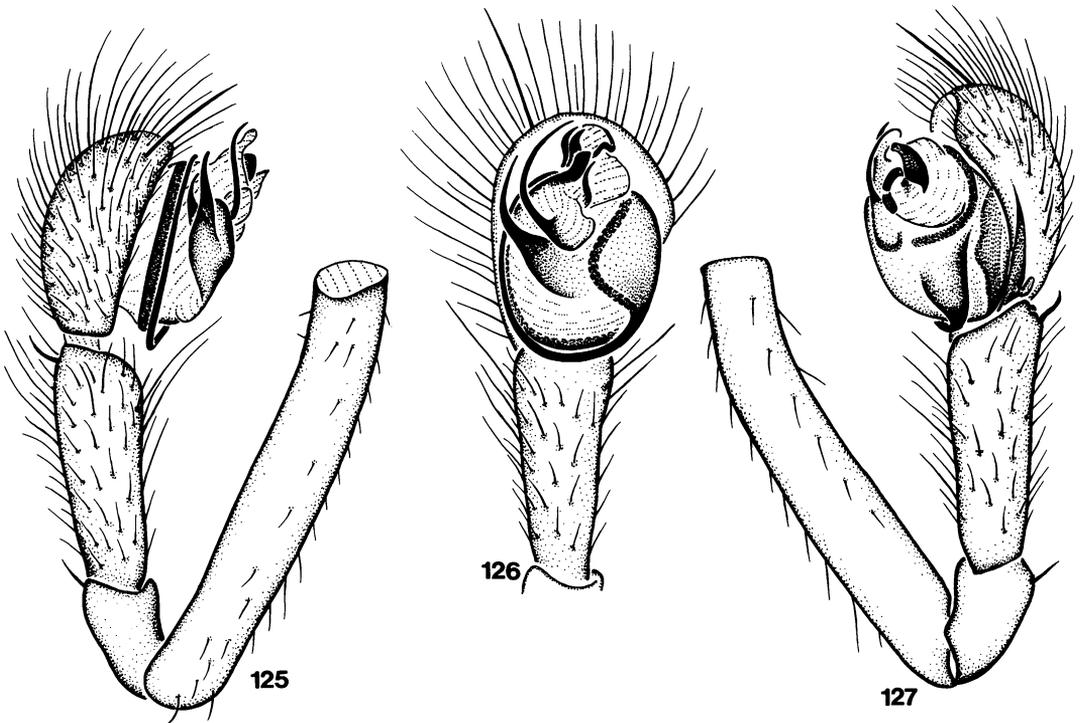
DESCRIPTION: Small (total length 2.5-4.0) ecribellate, entelegyne, araneomorph spiders. Carapace longer than wide, thoracic groove



Figs. 120–124. *Paratupua grayi*, new species. 120. Male, dorsal view. 121. Male, lateral view. 122. Male, pedicel and anterior abdominal region, dorsal view. 123. Female, dorsal view. 124. Female, lateral view.

a transverse furrow; ocular region behind AME usually elevated, setose in males (figs. 130–132); clypeus lower than in physoglenines, height 2–3 times AME diameter; secretory gland pores present on male clypeus, often present on ocular area as well (figs. 133, 134); posterior margin of male carapace with short, median peg associated with series of ridges on anterodorsal surface of abdomen (figs. 135, 136). Eight eyes in two rows, posterior row usually slightly recurved; AME smallest, other eyes subequal; MOQ narrower in front than in back, back width and length subequal. Chelicerae vertical, not elongate, with both promarginal and retromarginal teeth and patch of denticles in furrow (in contrast to single row of denticles characteristic of physoglenines; figs. 140–142). Endites about twice as long as wide, inclined over labium but not meeting (fig. 137); serrula

consisting of row of small teeth (figs. 138, 139). Labium about twice as wide as long, strongly rebordered. Sternum slightly longer than wide, not tuberculate, broadly clavate behind; coxae IV separated by their width. Leg formula 1243 or 1423; legs long, slender, first legs much longer than others; tarsi with three claws, superiors with teeth on proximal half, inferiors slender, longer than superiors, with single tooth; serrated bristles present below claws (fig. 146); trichobothria in double row on proximal half of tibia and single trichobothrium at one-fourth to one-half length of metatarsus; trichobothrial bases typical, with posterior hood reduced (fig. 144); modified trichobothria sometimes present on male palpal tibia; tarsal organ a simple dome (figs. 143, 209). Abdomen of males often more elongate than in females (strongly so in *Pa-horoides*); epiandrous glands opening from



Figs. 125-127. *Paratupua grayi*, new species, left male palp, prolateral, ventral, and retrolateral views.

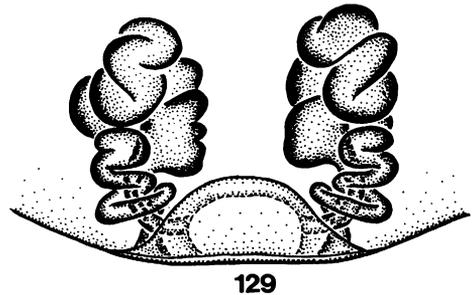
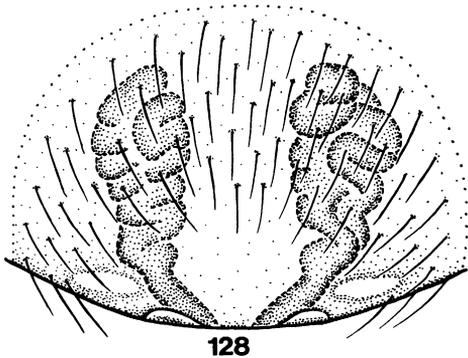
two widely separate bunches of three or four spigots (figs. 147, 246); respiratory system simple, four slender tracheal trunks extending from spiracle at base of spinnerets to near epigastric furrow. Male palp not elongated, without spiniform macrosetae but sometimes with trichobothrium-bearing spurs; embolus short in *Pahora* but strong, curved, long in other genera; paracymbium consisting of excavation on proximal edge of retromargin (fig.

155). Female palp with strong tarsal claw bearing single tooth. Internal female genitalia varied, epigynum sometimes with distinct lobe (*Pahora*, fig. 145) but generally not well developed.

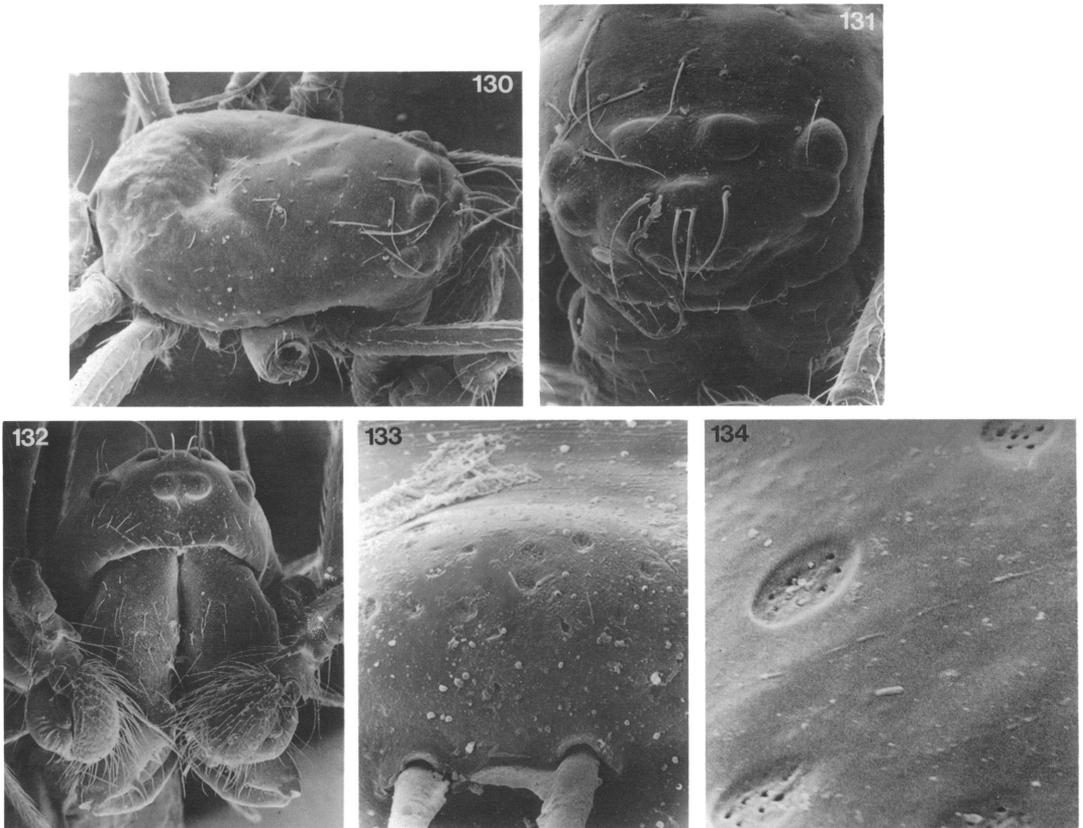
INCLUDED GENERA: *Pahora*, *Pahoroides*, *Wairua*, *Nomaua*, and *Runga*.

DISTRIBUTION: Known only from New Zealand.

NATURAL HISTORY: The pahorines con-



Figs. 128, 129. *Paratupua grayi*, new species, epigynum, ventral and dorsal views.



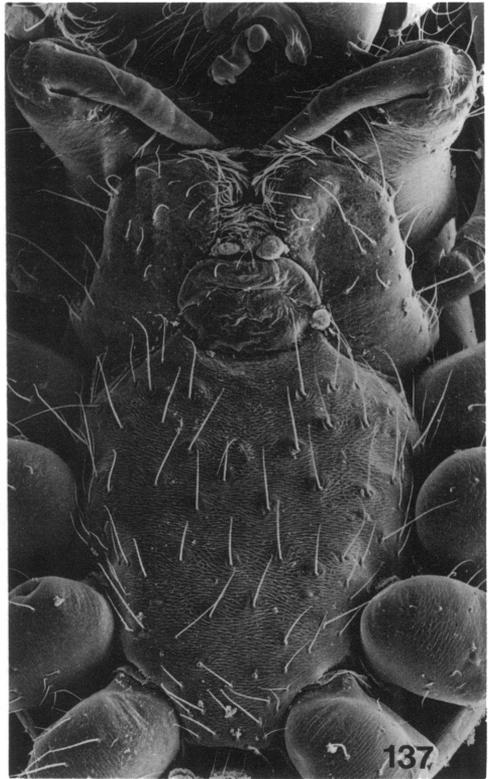
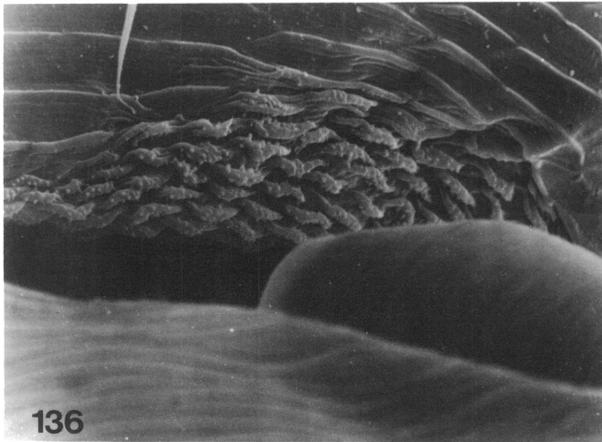
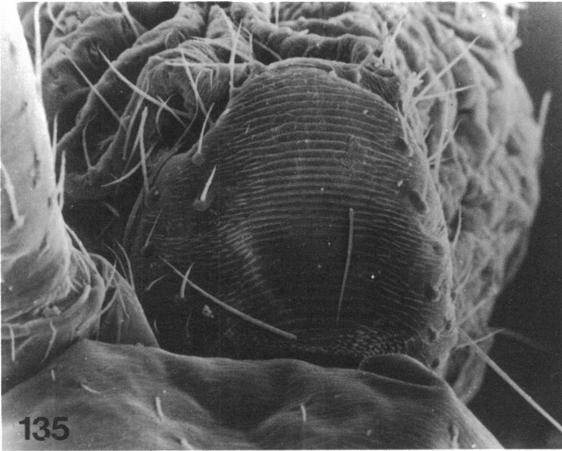
Figs. 130-134. *Pahora murihiku*, new species, male cephalothorax, oblique lateral, oblique anterior, and anterior views, with enlargements of pores on clypeus.

struct a distinctive snare consisting of an inverted bowl with numerous threads above the bowl (fig. 191). The spider hangs beneath the bowl.

KEY TO GENERA OF PAHORINAE

- 1. Eyemound of male with four macrosetae in transverse row; female epigynum with elongate scape projecting well back behind epigastric furrow 2
- Eyemound of male usually with numerous macrosetae in irregular clump (if only four, not in transverse row); female epigynum with at most a short mound or lobe overhanging epigastric furrow 3
- 2. Embolus of male palp short, originating distally near distal apophyses that do not extend beyond distal margin of cymbium; epigynal scape squat, projecting back less than one-fourth of distance between epigastric furrow and spinnerets *Pahora*

- Embolus of male palp originating near base of bulb, extending (with distal apophyses) well beyond distal margin of cymbium; epigynal scape elongate, slender, extending back one-half or more of distance between epigastric furrow and spinnerets *Pahoroides*
- 3. Epigynum well developed, often with prominent paired lobes; internal female genitalia consisting of two widely separated pairs of receptacula with short intromittent ducts; male palpal tibia with single elongate, slender distal macroseta; cymbial furrow with spine on anterior margin *Runga*
- Epigynum weakly developed, without paired lobes; receptacula paired or single, not widely separated, with long intromittent ducts; male palpal tibia usually with short but often stout macrosetae (sometimes lacking); cymbial furrow without spine on anterior margin 4
- 4. Epigynal region swollen, with paired openings at margin of epigastric furrow; internal female genitalia with single pair of receptacula



Figs. 135–137. *Pahora murihiku*, new species, male. 135, 136. Carapace-abdomen stridulatory apparatus, dorsal views. 137. Cephalothorax, ventral view.

on long, coiled intromittent ducts; male palpal tibia with single, short macroseta
 *Wairua*
 Epigynum a short lobe overhanging epigastric furrow; internal female genitalia with two pairs of receptacula (sometimes fused); intromittent ducts not coiled; male palpal tibia (and sometimes patella) with macrosetae stout if present (a denticulate lobe in *N. cauda*) *Nomaua*

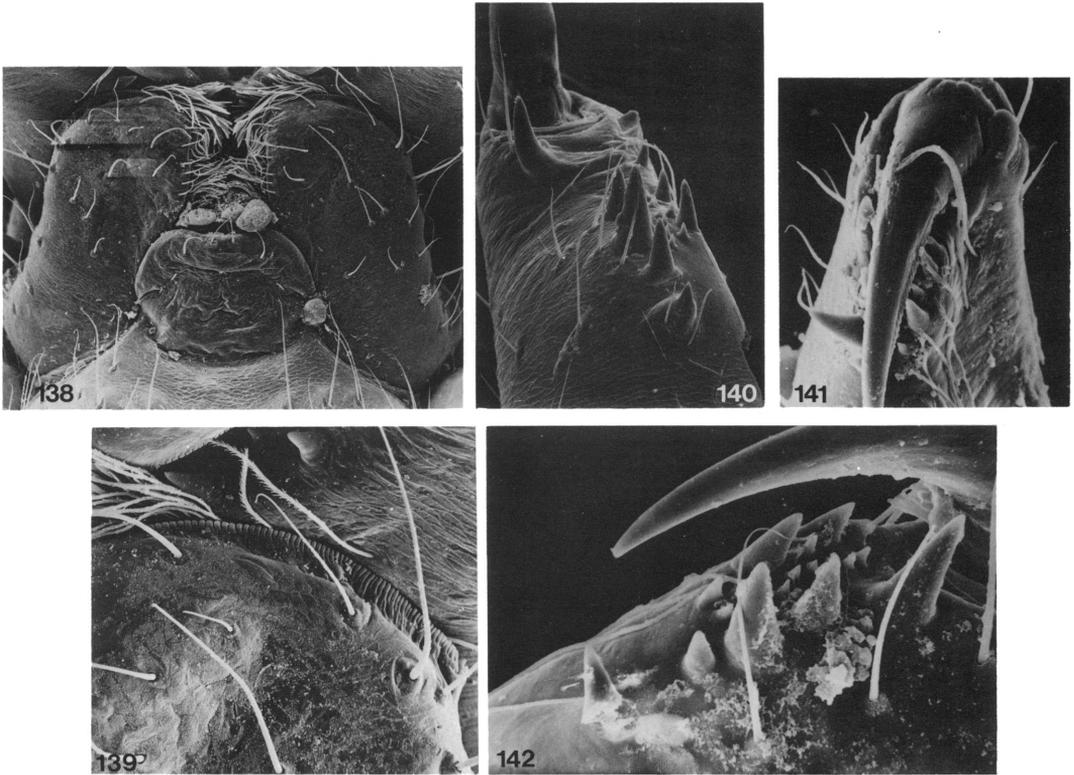
PAHORA FORSTER, NEW GENUS

TYPE SPECIES: *Pahora murihiku* Forster, new species.

ETYMOLOGY: The generic name is an arbitrary combination of letters considered feminine in gender.

DIAGNOSIS: The short embolus associated with the distal apophyses of the male palpal bulb, and the presence of an epigynal scape that projects back over the epigastric furrow of females to less than one-fourth the distance to the spinnerets, separate members of this genus from all other pahorines.

DESCRIPTION: Small (total length 1.5–2.5). Carapace longer than wide. Eyes subequal; MOQ wider behind than in front but back width and length subequal; distance between AME and ALE much greater in males than in females, clypeus distinctly higher in males; eyemound present only in males, low, with four bristles arranged 2:2, anterior pair closely spaced (reduced to one pair in *P. taranaki*); numerous multipore pits present both on



Figs. 138–142. *Pahora murihiku*, new species. 138. Labium and endites of male, ventral view. 139. Same, enlarged to show serrula. 140. Chelicera of male, medial view. 141, 142. Chelicera of female, medial and anterior views.

clypeus and ocular area of males. Chelicerae usually with four teeth on each margin and numerous intermarginal denticles. Abdomen subtriangular in side view, not much longer than high in both sexes. Male palp relatively short, not as long as carapace; tibia often with trichobothrium-bearing spurs (figs. 148–151); embolus short, not spiniform, associated with distal apophyses (figs. 152–154). Epigynum short (as compared to *Pahoroides*) lobe extending back over epigastric furrow, with pair of distal openings and transverse posterior sclerotization (figs. 158–160, apparently absent in *P. taranaki*, fig. 181). Internal genitalia consisting of two long ducts leading back to small, compound receptaculum formed from two partly fused receptacula; fertilization duct broadly triangular.

DISTRIBUTION: Predominantly from the South and Stewart Islands of New Zealand, but also known from a single locality on the North Island (Taranaki).

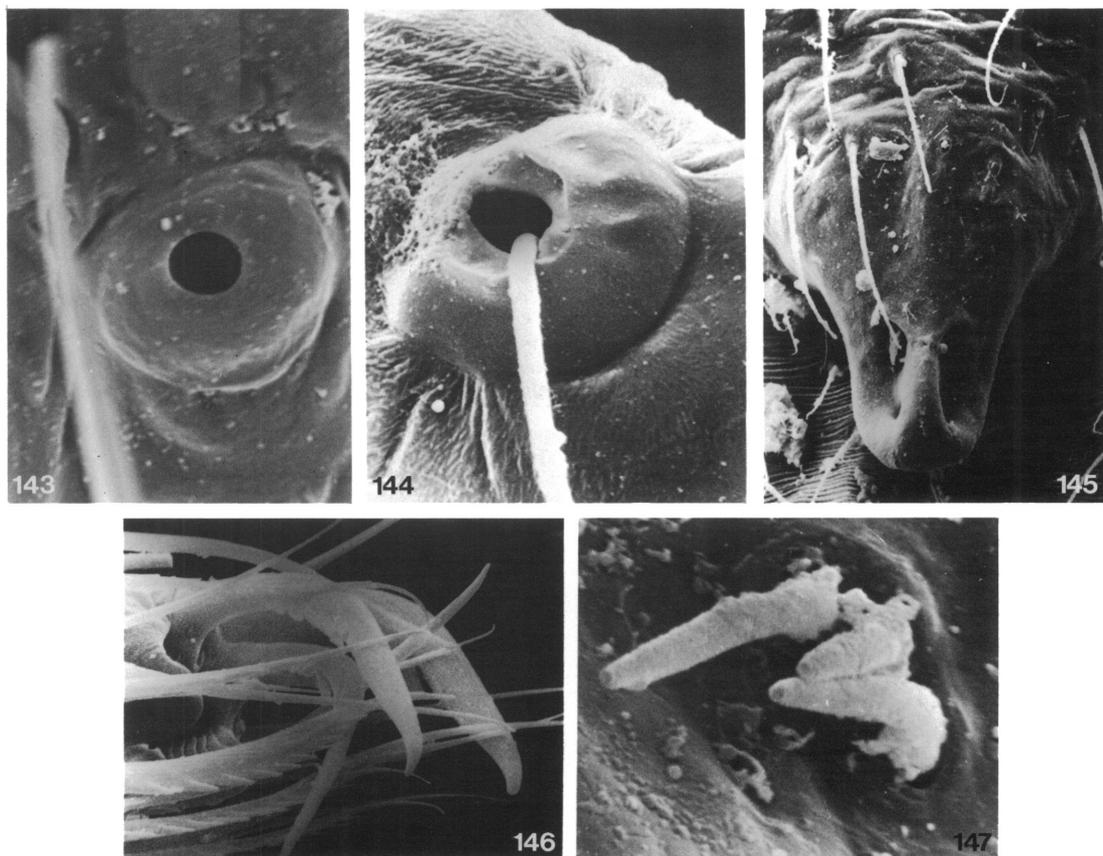
Pahora murihiku Forster,
new species
Figures 130–158

TYPES: Male holotype and female allotype from Leith Saddle, near Dunedin, Otago, South Island, New Zealand (Feb. 2, 1978; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the Maori name for the southern part of the South Island of New Zealand.

DIAGNOSIS: The male palpal tibia bears a transverse row of three trichobothrium-bearing spurs (figs. 148–151); the trilobed female receptacula are on long, rounded ducts (fig. 158).

MALE: Total length 2.78. Carapace 1.31 long, 0.77 wide. Abdomen 1.46 long, 0.92 wide, 0.92 high. Leg lengths: I 9.78, II 5.16, III 4.31, IV 5.46. Eye sizes and interdistances: AME 0.03, ALE 0.04, PME 0.06, PLE



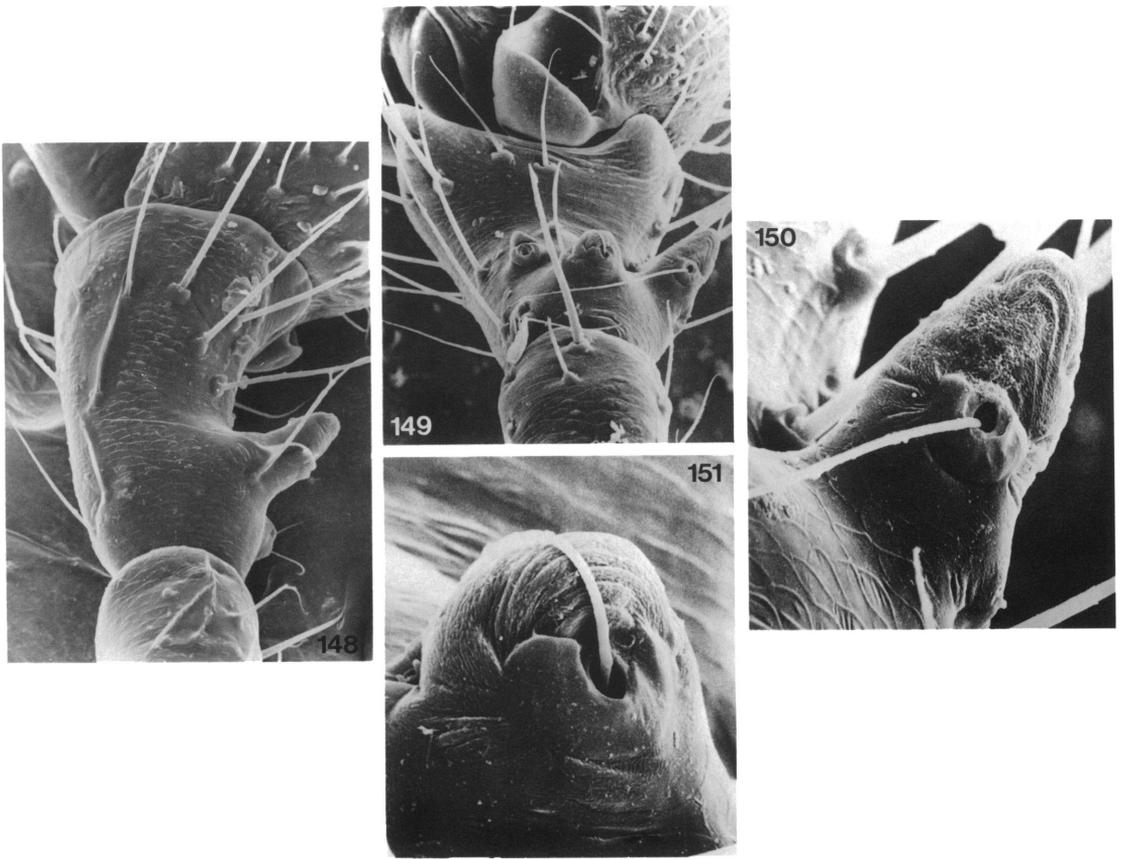
Figs. 143–147. *Pahora murihiku*, new species. **143.** Tarsal organ from male palpal cymbium, dorsal view. **144.** Trichobothrium from male palpal tibia, dorsal view. **145.** Epigynum, ventral view. **146.** Tarsal claws of female, lateral view. **147.** Epiandrous gland spigots of male, ventral view.

0.04; AME-AME 0.03, AME-ALE 0.11, PME-PME 0.06, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.20, front width 0.09, back width 0.18. Clypeal height three times AME diameter. Eyemound low, with four bristles. Chelicerae 0.62 long, with five teeth on promargin, three on retromargin, distal promarginal tooth strong. Carapace yellow-brown with black median band; abdomen with black shading relieved with white patches (figs. 156, 157); sternum and abdominal venter shaded with black. Palp 1.23 long; tibia with three dorsal spurs (figs. 148–151), each with trichobothrium near base and corrugated beyond; bulb spherical (figs. 152–154); paracymbial pit deeply excavated (fig. 155).

FEMALE: Total length 2.29. Carapace 1.00 long, 0.62 wide. Abdomen 1.31 long, 0.85

wide, 1.16 high. Leg lengths: I 8.09, II 5.01, III 3.08, IV 4.31. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.02, AME-ALE 0.06, PME-PME 0.04, PME-PLE 0.04. ALE-PLE 0.02; MOQ length 0.19, front width 0.10, back width 0.18. Clypeal height twice AME diameter. Chelicerae 0.31 long, dentition similar but distal promarginal tooth not strong. Coloration as in male. Palp 0.31 long. Epigynal lobe triangular (fig. 145); internal genitalia with trilobed receptacula on long, broadly curved ducts (fig. 158).

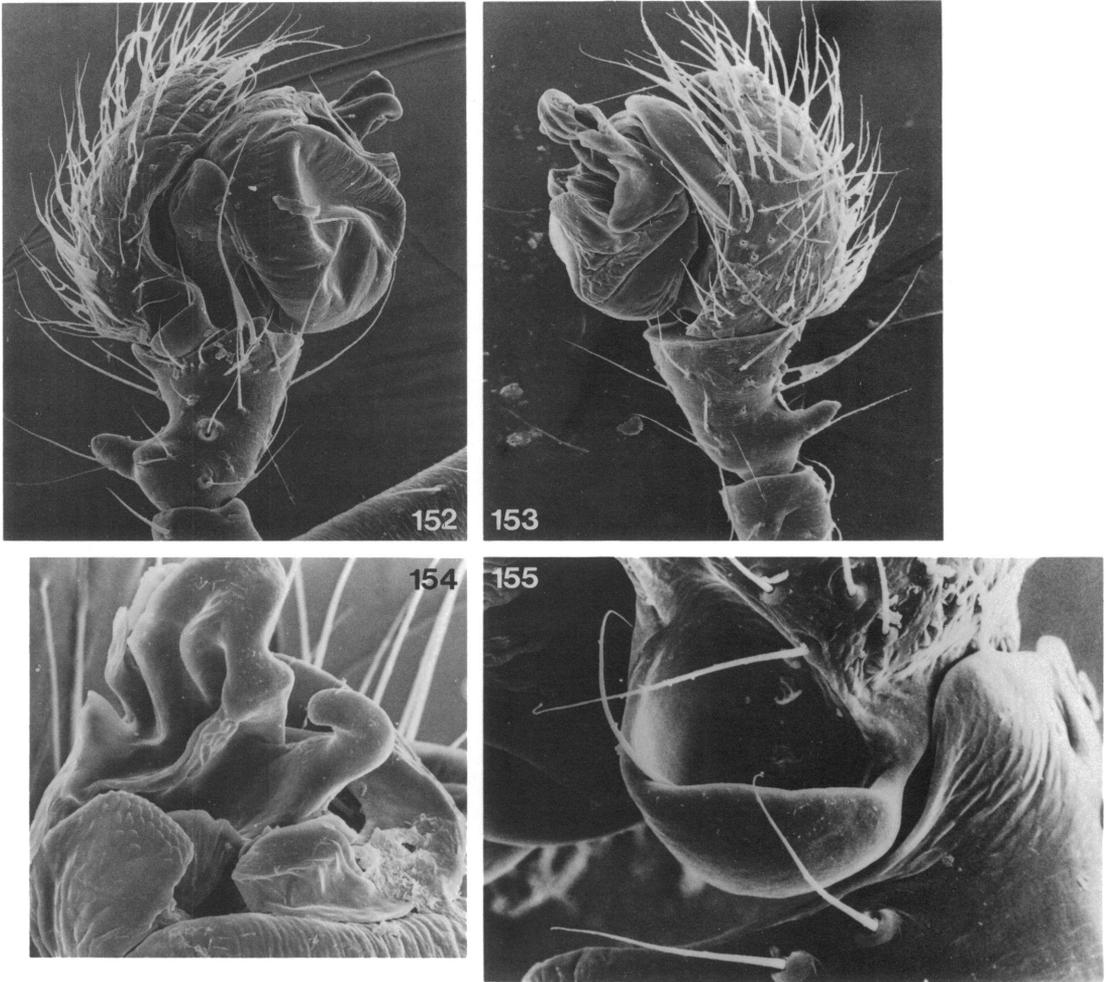
OTHER MATERIAL EXAMINED: New Zealand: **South Island:** *Otago:* Balclutha Plant Reserve, Apr. 21, 1966 (C. L. Wilton, OMD), 1♀; Bull Creek, May 14, 1967 (R. W. Hutton, OMD), 1♂, 3♀, Mar. 27, 1970 (C. L. Wilton,



Figs. 148-151. *Pahora murihiku*, new species, male palpal tibia, retrolateral and dorsal views, with enlargements of trichobothrium-bearing spurs.

OMD), 4♂, 9♀; forest near Chimney, Clinton-Wyndham Road, Mar. 12, 1970 (C. L. Wilton, OMD), 1♂; Couttes Gulley, Taieri Mouth, July 6, 1952 (B. J. Marples, OMD), 2♀; Evensdale Glen, Oct. 10, 1978 (R. R. Forster, OMD), 3♀; Frazers Gulley, Dunedin, Dec. 5, 1965 (C. L. Wilton, OMD), 4♀, May 17, 1969 (C. L. Wilton, OMD), 4♀; Hindon, Nov. 30, 1969 (C. L. Wilton, OMD), 1♀; Kaka Point Reserve, Mar. 4, 1988 (R. R. Forster, OMD), 5♂, 3♀; Leith Saddle, near Dunedin, Jan. 22, 1966 (C. L. Wilton, OMD), 2♂, Nov. 10, 1968 (C. L. Wilton, OMD), 1♀, Feb. 1, 1970 (R. R. Forster, AMNH), 2♂, 2♀, Mar. 4, 1970 (R. R. Forster, C. L. Wilton, OMD), 3♂, 10♀, Dec. 8, 1974 (R. R. Forster, OMD), 2♀, Oct. 1975 (R. R. Forster, OMD), 2♂, 3♀, Dec. 10, 1975 (R. R. Forster, OMD), 1♂, 5♀, Jan. 20, 1976 (R. R. Forster, OMD), 3♂, 3♀, Feb. 10, 1976 (R. R. Forster, OMD), 3♂, Mar. 15, 1977 (R.

R. Forster, OMD), 1♀, Feb. 2, 1978 (R. R. Forster, OMD), 22♀, Nov. 18, 1978 (R. R. Forster, OMD), 1♀, Feb. 5, 1979 (R. R. Forster, OMD), 1♂, 2♀, Feb. 24, 1979 (R. R. Forster, OMD), 2♂, 5♀, Oct. 12, 1979 (R. R. Forster, OMD), 2♂, 2♀, Dec. 11, 1979 (R. R. Forster, OMD), 3♀, Nov. 15, 1980 (R. R. Forster, OMD), 7♂, 9♀, Jan. 1, 1982 (R. R. Forster, OMD), 2♂, 2♀, Dec. 10, 1985 (R. R. Forster, OMD), 1♀, Dec. 27, 1985 (R. R. Forster, OMD), 2♂; Mount Cargill, Apr. 10, 1950 (B. J. Marples, OMD), 2♂, Sept. 25, 1965 (C. L. Wilton, OMD), 1♀; Mount Cargill Road, Dec. 28, 1953 (B. J. Marples, OMD), 1♂; Opoho Bush, Dunedin, Dec. 1944 (T. M. Smith, OMD), 1♂; Signal Hill, Dunedin, Feb. 1, 1958 (R. R. Forster, OMD), 1♂; Taieri Mouth, Jan. 14, 1962 (B. J. Marples, OMD), 2♂; Trotters Gorge, Mar. 10, 1978, from ferns (R. R. Forster, OMD), 3♂, Dec. 30, 1978 (R.



Figs. 152-155. *Pahora murihiku*, new species, male palp, retrolateral, prolateral, and ventral views, with enlargement of paracymbial excavation.

R. Forster, OMD), 1♂; Waipori Gorge, Dec. 8, 1966 (R. R. Forster, OMD), 3♂, 16♀, Nov. 13, 1970 (R. R. Forster, OMD), 3♂, 9♀, Jan. 12, 1979 (R. R. Forster, C. L. Wilton, OMD), 2♂, 2♀; Waipori Gorge, near Dam 4, Nov. 18, 1966 (R. R. Forster, C. L. Wilton, OMD), 1♂, 3♀; Whare Flat, Mar. 20, 1978 (R. R. Forster, OMD), 1♂. *Southland*: Croydon Bush, near Gore, Feb. 17, 1966 (C. L. Wilton, OMD), 1♂, 1♀.

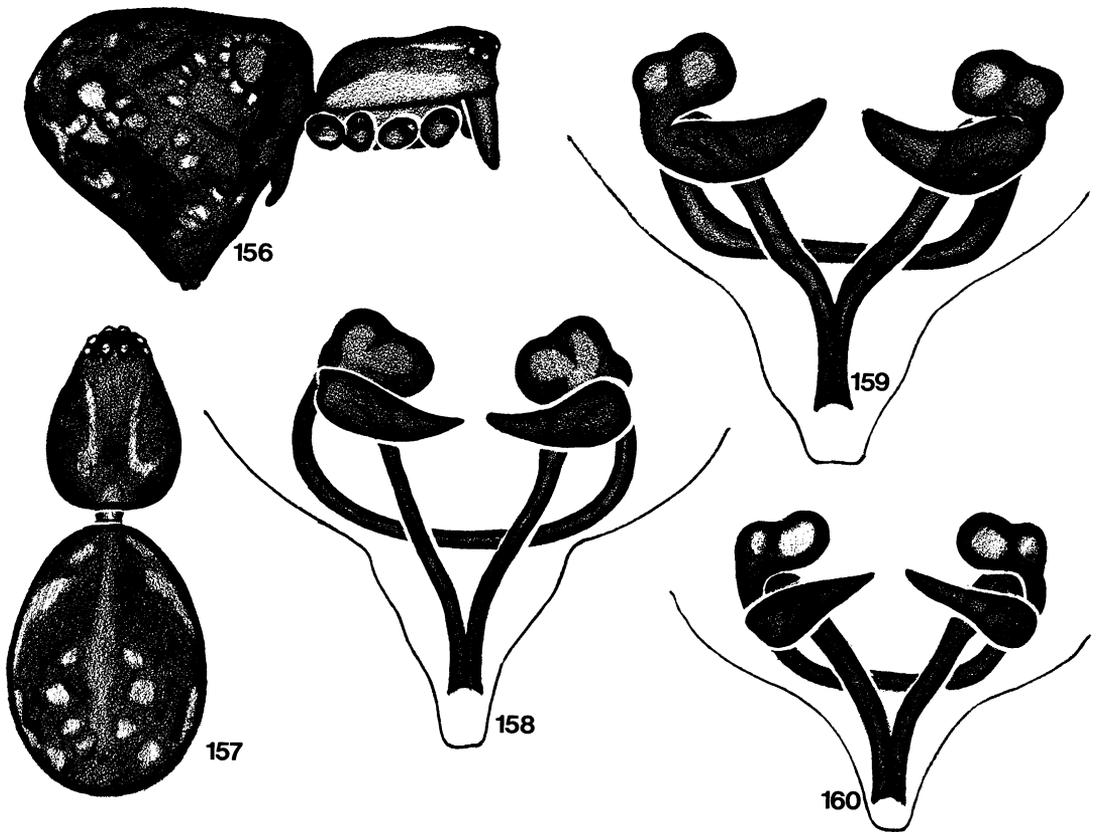
DISTRIBUTION: This species is found in Otago and Southland, South Island, New Zealand, where it inhabits shaded forest (in contrast to *P. graminicola* which shares a similar geographic distribution but is found in open tussock habitats or forest margins).

Pahora graminicola Forster,
new species
Figures 159, 161-163

TYPES: Male holotype from pitfall trap at corner of Kyeburn and Dansey Pass Roads, Otago, South Island, New Zealand (Nov. 25, 1967; C. L. Wilton), and female allotype from pitfall trap at Deepdell (Jan. 27, 1967; C. L. Wilton), deposited in OMD.

ETYMOLOGY: The specific name refers to the preferred habitat of the species.

DIAGNOSIS: This species seems closely related to *P. murihiku* but is smaller, with a distinct pale band down the midline of the carapace; the male palpal tibia is longer (fig.



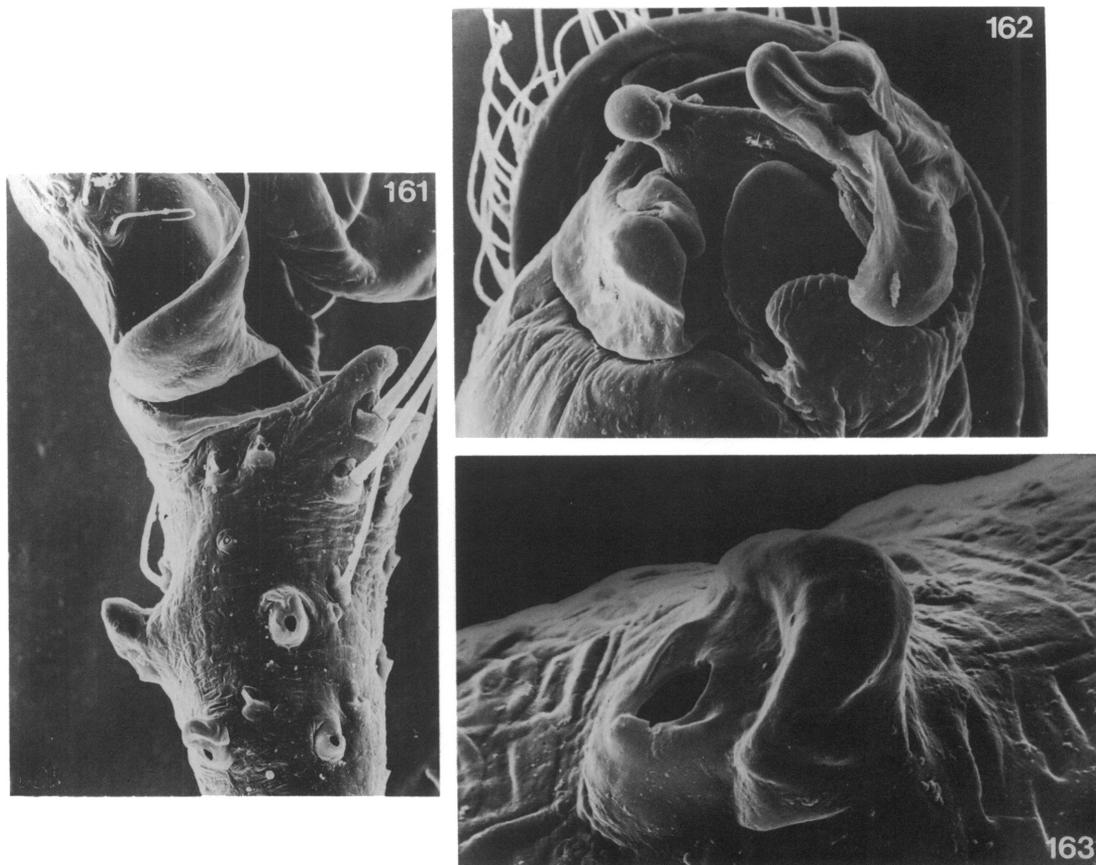
Figs. 156–160. 156–158. *Pahora murihiku*, new species. 159. *P. graminicola*, new species. 160. *P. kaituna*, new species. 156, 157. Female, lateral and dorsal views. 158–160. Epigynum, dorsal views.

161) and the female epigynal ducts are thicker (fig. 159).

MALE: Total length 2.41. Carapace 1.08 long, 0.62 wide. Abdomen 1.31 long, 0.54 wide, 0.78 high. Leg lengths: I 8.47, II 5.39, III 3.23, IV 4.54. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.07, PLE 0.06; AME-AME 0.02, AME-ALE 0.06, PME-PME 0.06, PME-PLE 0.04, ALE-PLE 0.01; MOQ length 0.18, front width 0.09, back width 0.20. Eyemound low, with four bristles. Clypeal height twice AME diameter. Chelicerae 0.62 long, teeth as in *P. murihiku*. Carapace heavily shaded with black apart from broad pale band extending from behind eyes to posterior margin of carapace; abdomen lightly shaded with indistinct transverse chevrons. Palp 1.13 long; tibia with single enlarged dorsal spur and shorter retrolateral one (figs. 161, 163); bulb as in figure 162.

FEMALE: Total length 1.95. Carapace 0.78 long, 0.62 wide. Abdomen 1.16 long, 0.92 wide, 0.92 high. Leg lengths: I 5.70, II 3.54, III 2.16, IV 3.77. Eye sizes and interdistances: AME 0.03, ALE 0.04, PME 0.04, PLE 0.04; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.03, PME-PLE 0.04, ALE-PLE 0.01; MOQ length 0.11, front width 0.09, back width 0.11. Eyemound, clypeus, and coloration as in male. Epigynal lobe broader than in *P. murihiku*, internal genitalia with thicker ducts (fig. 159).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Otago:* roadside W Blackstone Hill, Nov. 19, 1966, pitfall (C. L. Wilton, OMD), 1♀; Bobby's Head Road, near Palmerston, Oct. 20, 1960, tussock (C. L. Wilton, OMD), 1♂; between Bushey and Goodwood, Oct. 20, 1968, from carex (C. L. Wilton, OMD), 1♀; Corner Little Kyeburn,



Figs. 161–163. *Pahora graminicola*, new species, male palp. 161. Tibia, retrolateral view. 162. Bulb, ventral view. 163. Trichobothrium-bearing spur on tibia, dorsal view.

Naseby-Dansey Pass Road, Aug. 16, 1967, pitfall (C. L. Wilton, OMD), 1♀, Oct. 25, 1967 (C. L. Wilton, OMD), 1♀; Flagstaff, Sept. 1975, tussock (R. R. Forster, OMD), 1♂; Lake Tuakitoto, near Kaitangata, Sept. 14, 1967, from carex (R. R. Forster, OMD), 2♀; Lee Stream Bridge, Outram-Hindon Road, Nov. 30, 1969 (C. L. Wilton, OMD), 1♀; near summit, Lindis Pass, Feb. 8, 1970, tussock (C. L. Wilton, OMD), 1♂; Logan Burn, Nov. 3–18, 1982, elev. 900 m, pitfall (B. I. P. Barrat, OMD), 1♀; Nenthorn, Apr. 23, 1967, pitfall (C. L. Wilton, OMD), 1♂; branch of Waipahi Stream, near The Cairn, south Clinton-Wyndham Road, Mar. 12, 1970 (C. L. Wilton, OMD), 2♀; Waitahuna Bridge, near Lawrence, Jan. 2, 1970, pitfall (C. L. Wilton, OMD), 1♂, 2♀. *Southland*: Dolamore Park, near Gore, Sept. 15, 1979, tussock (R. R.

Forster, OMD), 1♀. *Canterbury*: Peel Forest, Jan. 20, 1982, carex swamp (R. R. Forster, OMD), 1♀.

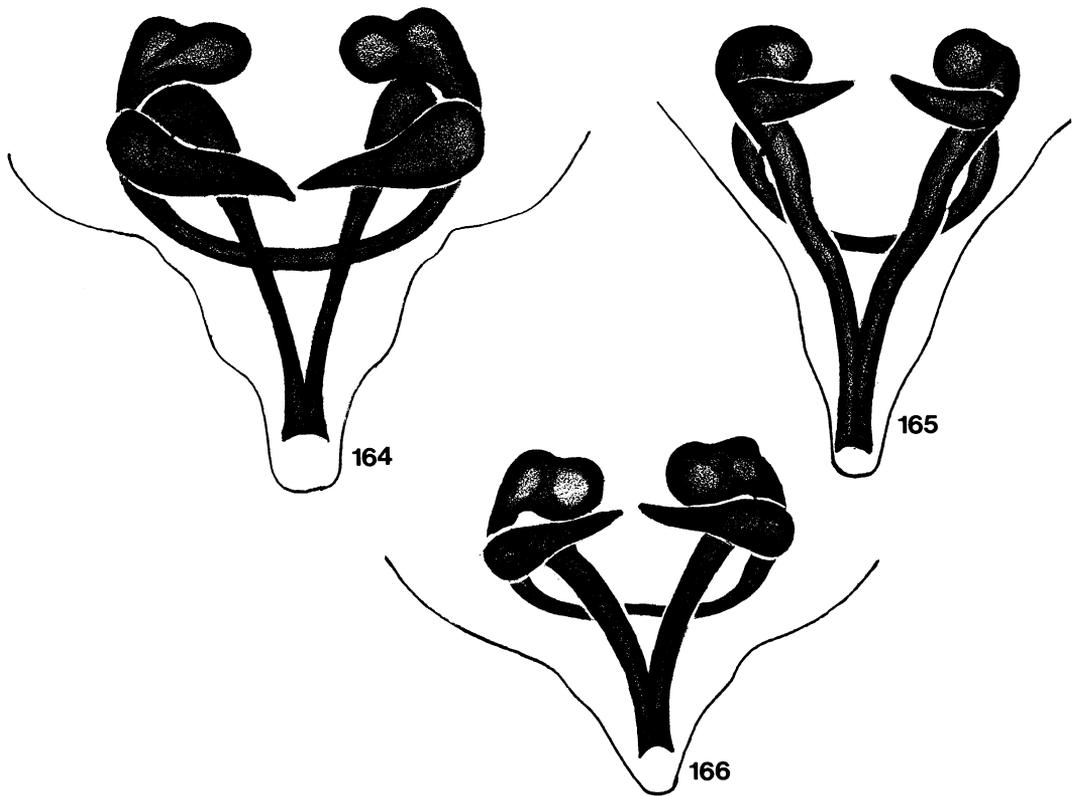
DISTRIBUTION: Inland Otago, northern Southland, and southern Canterbury, South Island, New Zealand, in tussock and swamps.

Pahora rakiura Forster,
new species
Figure 164

TYPE: Female holotype from Fern Gulley, Stewart Island (Mar. 9, 1986; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the Maori name for Stewart Island.

DIAGNOSIS: This species is characterized by



Figs. 164–166. Female epigynum, dorsal views. **164.** *Pahora rakiura*, new species. **165.** *P. wiltoni*, new species. **166.** *P. montana*, new species.

the anteriorly arched intromittent ducts of females (fig. 164).

MALE: Unknown.

FEMALE: Total length 2.17. Carapace 0.92 long, 0.77 wide. Abdomen 1.23 long, 1.08 wide, 1.31 high. Leg lengths: I 6.62, II 4.85, III 3.00, IV 4.39. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.06, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.15, front width 0.09, back width 0.18. Clypeal height three times AME diameter. Carapace uniform brown; abdomen brown, mottled with small white patches. Intromittent ducts anteriorly arched (fig. 164).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Southland:* Western Te Wae Wae Bay, Mar. 11, 1970 (C. L. Wilton, OMD), 1♀. **Stewart Island:** Owen Island, southeast part of island, Jan. 29, 1955 (R. K.

Dell, B. A. Holloway, NMW), 1♀; Small Craft Retreat Island, Jan. 23, 1955 (R. K. Dell, B. A. Holloway, NMW), 1♀.

DISTRIBUTION: Known only from Stewart Island and the adjacent mainland.

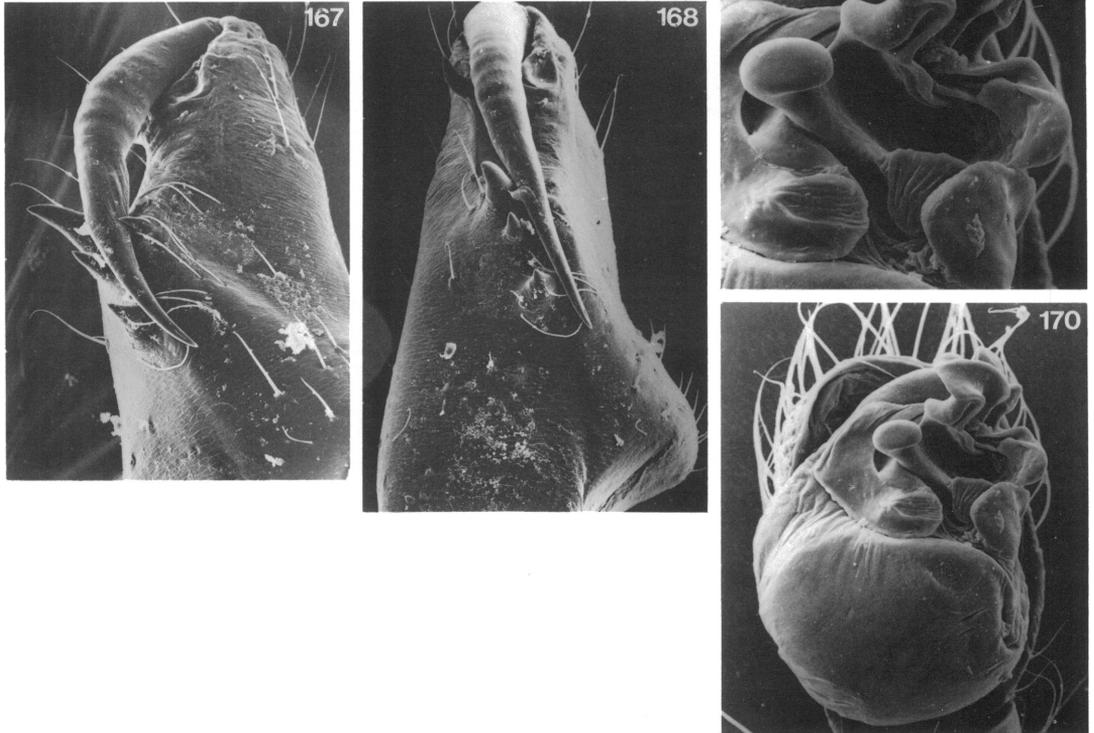
Pahora cantuarria Forster,
new species
Figures 169–170

TYPES: Male holotype from Waihi Gorge, Canterbury, South Island, New Zealand (May 1, 1983; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to the type locality in Canterbury Province.

DIAGNOSIS: This species is characterized by the claviform distal apophyses on the male palpal bulb (figs. 169, 170).

MALE: Total length 2.82. Carapace 1.26 long, 0.92 wide. Abdomen 1.54 long, 1.00 wide, 1.23 high. Leg lengths: I 10.24, II 6.62,



Figs. 167–170. **167, 168.** *Pahora wiltoni*, new species, male chelicera, posterior and medial views. **169, 170.** *Pahora cantuaria*, new species, male palpal bulb, ventral views.

III 4.24, IV 5.31. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.03, AME-ALE 0.11, PME-PME 0.09, PME-PLE 0.09, ALE-PLE 0.01; MOQ length 0.26, front width 0.11, back width 0.23. Clypeal height three times AME diameter. Eyemound low, with four bristles. Chelicerae 0.85 long, divergent. Carapace with median and lateral dark bands; abdomen with white patches along dorsum and on lateral and ventral surfaces. Palp 1.39 long; distal apophyses of bulb as in figures 169, 170.

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Canterbury, South Island, New Zealand.

Pahora kaituna Forster,
new species
Figure 160

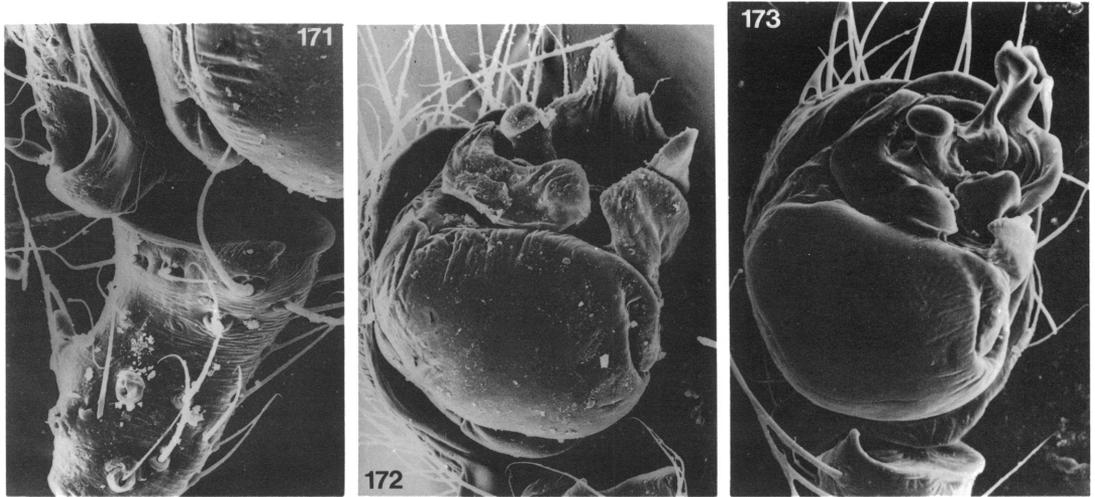
TYPES: Female holotype from Kaituna Valley, Banks Peninsula, Canterbury, South Island, New Zealand (May 24, 1974; R. R. Forster), deposited in CMC.

ETYMOLOGY: This specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The short intromittent ducts of females resemble those of *P. montana* but the epigynal lobe is more smoothly narrowed (fig. 160).

MALE: Unknown.

FEMALE: Total length 2.45. Carapace 0.92 long, 0.62 wide. Abdomen 1.54 long, 1.08



Figs. 171–173. 171, 172. *Pahora wiltoni*, new species. 173. *P. media*, new species. 171. Male palpal tibia and paracymbium, ventral view. 172, 173. Male palpal bulb, ventral views.

wide, 1.16 high. Leg lengths: I 8.24, II 5.31, III 2.93, IV 5.00. Eye sizes and interdistances: AME 0.03, ALE 0.04, PME 0.04, PLE 0.04; AME-AME 0.02, AME-ALE 0.03, PME-PME 0.04, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.12, front width 0.06, back width 0.12. Clypeal height twice AME diameter. Chelicerae 0.28 long. Epigynal lobe smoothly narrowed, intromittent ducts short (fig. 160).

OTHER MATERIAL EXAMINED: Two females taken with the types (CMC).

DISTRIBUTION: Known only from the Banks Peninsula, Canterbury, South Island, New Zealand.

Pahora wiltoni Forster,
new species

Figures 165, 167, 168, 171, 172

TYPES: Male holotype and female allotype taken by beating in forest at Okaratahi Bridge, N of Conway River, Marlborough, South Island, New Zealand (Sept. 22, 1967; C. L. Wilton), deposited in OMD.

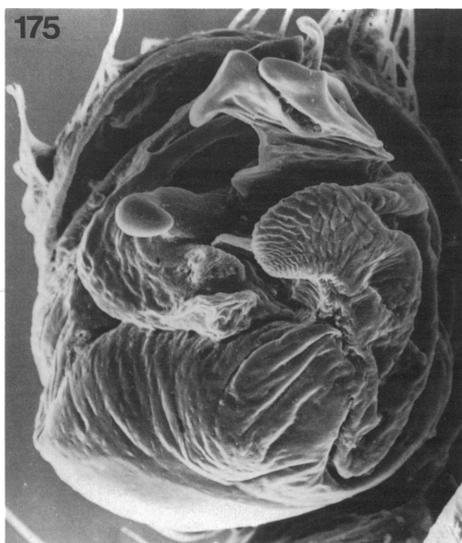
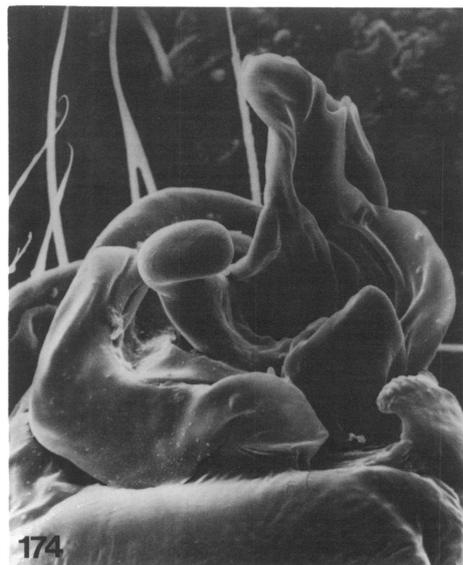
ETYMOLOGY: The specific name is a patronym in honor of C. L. Wilton, who greatly advanced the study of spiders in New Zealand.

DIAGNOSIS: This species can be distinguished by the angular distal apophyses on the male palpal bulb (fig. 172) and by the

rounded receptacula on long, narrowly separated intromittent ducts of females (fig. 165).

MALE: Total length 2.10. Carapace 1.16 long, 0.69 wide. Abdomen 0.92 long, 0.69 wide, 0.92 high. Leg lengths: I 7.24, II 4.93, III 2.70, IV 3.39. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.03, AME-ALE 0.10, PME-PME 0.06, PME-PLE 0.07, ALE-PLE 0.01; MOQ length 0.17, front width 0.09, back width 0.18. Clypeal height twice AME diameter. Eyemound low, with four bristles. Chelicerae 0.62 long, with basal retrolateral mound and long curved fangs; strong prodistal tooth and three further teeth, of which most distal is largest, along proximal promargin; single retromarginal tooth near midmargin (figs. 167, 168). Carapace black with pale patch on each side of thoracic groove; abdomen gray with two rows of white patches down dorsum and few on lateral margins. Palp 0.84 long; tibia similar to that of *P. graminicola* (fig. 171); distal apophyses of bulb angular (fig. 172).

FEMALE: Total length 2.12. Carapace 0.92 long, 0.62 wide. Abdomen 1.23 long, 0.92 wide, 1.08 high. Leg lengths: I 6.08, II 4.24, III 2.77, IV 4.00. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.02, AME-ALE 0.04, PME-PME 0.05, PME-PLE 0.05, ALE-PLE 0.01; MOQ length 0.18, front width 0.10,



Figs. 174–176. Male palpal bulb, ventral views. 174. *Pahora media*, new species. 175, 176. *P. taranaki*, new species.

back width 0.19. Clypeal height only 1.5 times AME diameter. Chelicerae 0.46 long, basal mound absent; three teeth on each margin. Coloration as in male. Epigynal lobe elongate; intromittent ducts long, approximate; receptacula rounded (fig. 165).

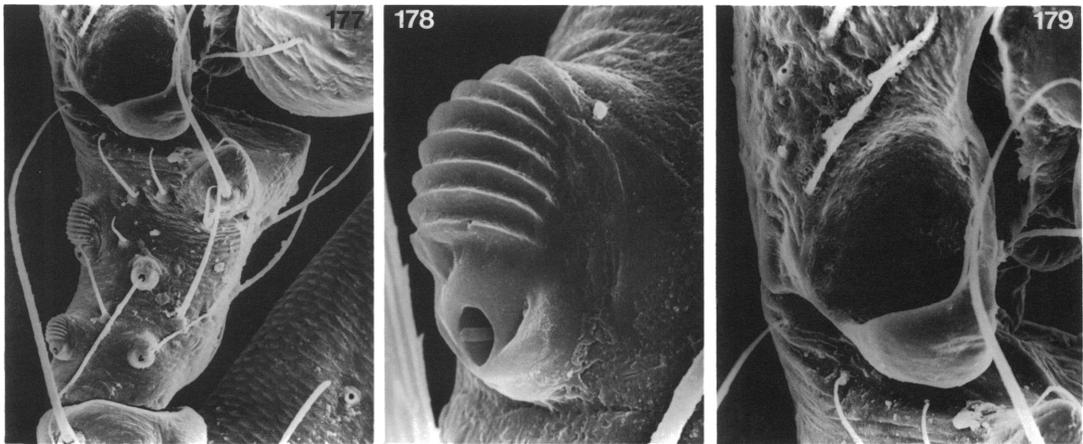
OTHER MATERIAL EXAMINED: One female taken with the types (OMD).

DISTRIBUTION: Known only from southern Marlborough, South Island, New Zealand.

Pahora montana Forster,
new species
Figure 166

TYPE: Female holotype collected from web at night at Haast Pass, Westland, South Island, New Zealand (Mar. 15, 1966; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to the montane habitat.



Figs. 177–179. *Pahora taranaki*, new species, male palp, retrolateral views. 177. Tibia. 178. Trichobothrium-bearing spur on tibia. 179. Paracymbial excavation.

DIAGNOSIS: Females are characterized by the relatively short, wide epigynal lobe (fig. 166).

MALE: Unknown.

FEMALE: Total length 1.92. Carapace 0.85 long, 0.62 wide. Abdomen 1.08 long, 0.77 wide, 0.92 high. Leg lengths: I 6.08, II 4.31, III 2.70, IV 3.70. Eye sizes and interdistances: all eyes 0.04; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.06, PME-PLE 0.06, ALE-PLE 0.01; MOQ length 0.15, front width 0.11, back width 0.14. Clypeal height twice AME diameter. Chelicerae 0.39 long. Carapace dark except for pale area between eyes and thoracic groove; abdomen with reticulate shading on dorsum and two dark bands on ventral surface from epigastric furrow to spinnerets. Epigynal lobe sinuous; intromittent ducts short, wide (fig. 166).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Westland, South Island, New Zealand.

Pahora media Forster,
new species
Figures 173, 174, 180

TYPES: Male holotype from litter taken at Black Birch Range, Marlborough, South Island, New Zealand (Feb. 13, 1970; A. C. Eyles), and female allotype from litter taken at Shakespeare Bay, Nelson, South Island,

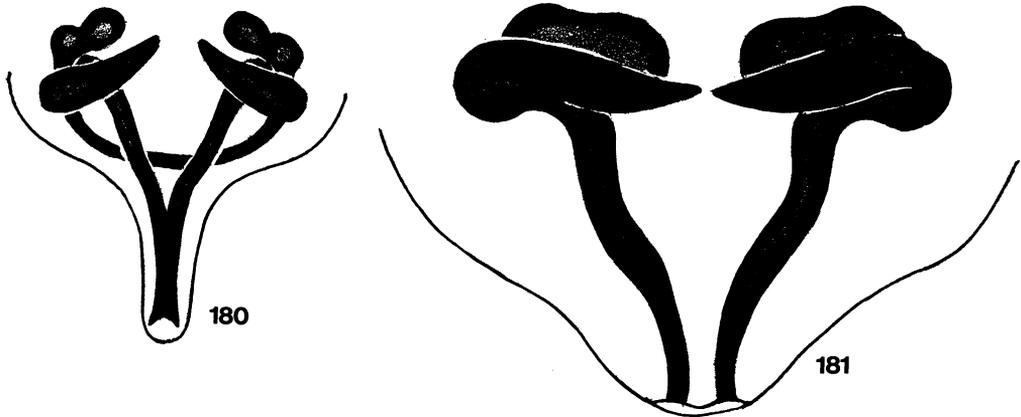
New Zealand (Feb. 21, 1973; J. McBurney), deposited in EDA.

ETYMOLOGY: The specific name refers to the distribution in the middle of New Zealand.

DIAGNOSIS: The elongated prolateral apophysis on the male palp (fig. 173, 174) and the extremely narrow epigynal lobe of females (fig. 180) are diagnostic.

MALE: Total length 1.90 Carapace 1.00 long, 0.69 wide. Abdomen 0.92 long, 0.77 wide, 0.92 high. Leg lengths: I 6.16, II 4.39, III 2.77, IV 3.93. Eye sizes and interdistances: AME 0.02, ALE 0.04, PME 0.04, PLE 0.04; AME-AME 0.01, AME-ALE 0.08, PME-PME 0.06, PME-PLE 0.06, ALE-PLE 0.01; MOQ length 0.13, front width 0.05, back width 0.14. Clypeal height slightly more than three times AME diameter. Eyemound typical, with four bristles. Chelicerae 0.62 long, divergent, with three evenly spaced pro-marginal and two midretromarginal teeth. Carapace shaded except for pale band between eyes and thoracic groove; abdomen with faint marginal band but otherwise mottled with gray and white patches. Palp 1.00 long; most prolateral of distal apophyses on palpal bulb elongate (figs. 173, 174).

FEMALE: Total length 1.75. Carapace 0.77 long, 0.62 wide. Abdomen 1.00 long, 0.85 wide, 0.92 high. Leg lengths: I missing, II 3.54, III 2.54, IV 3.00. Eye sizes and inter-



Figs. 180, 181. Epigynum, dorsal views. 180. *Pahora media*, new species. 181. *P. taranaki*, new species.

distances as in male except AME-ALE 0.04; MOQ length 0.13, front width 0.07, back width 0.14. Clypeal height only twice AME diameter. Chelicerae 0.46 long. Coloration as in male. Epigynal lobe extremely long, narrow (fig. 180).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Marlborough and Nelson, South Island, New Zealand.

Pahora taranaki Forster,
new species

Figures 175–179, 181

TYPES: Male holotype taken in forest on the N slope of Mt. Egmont, Taranaki, North Island, New Zealand (Feb. 24, 1967; C. L. Wilton), and female allotype taken at an elevation of 3000 ft on the same mountain (Feb. 22, 1967; C. L. Wilton), deposited in OMD.

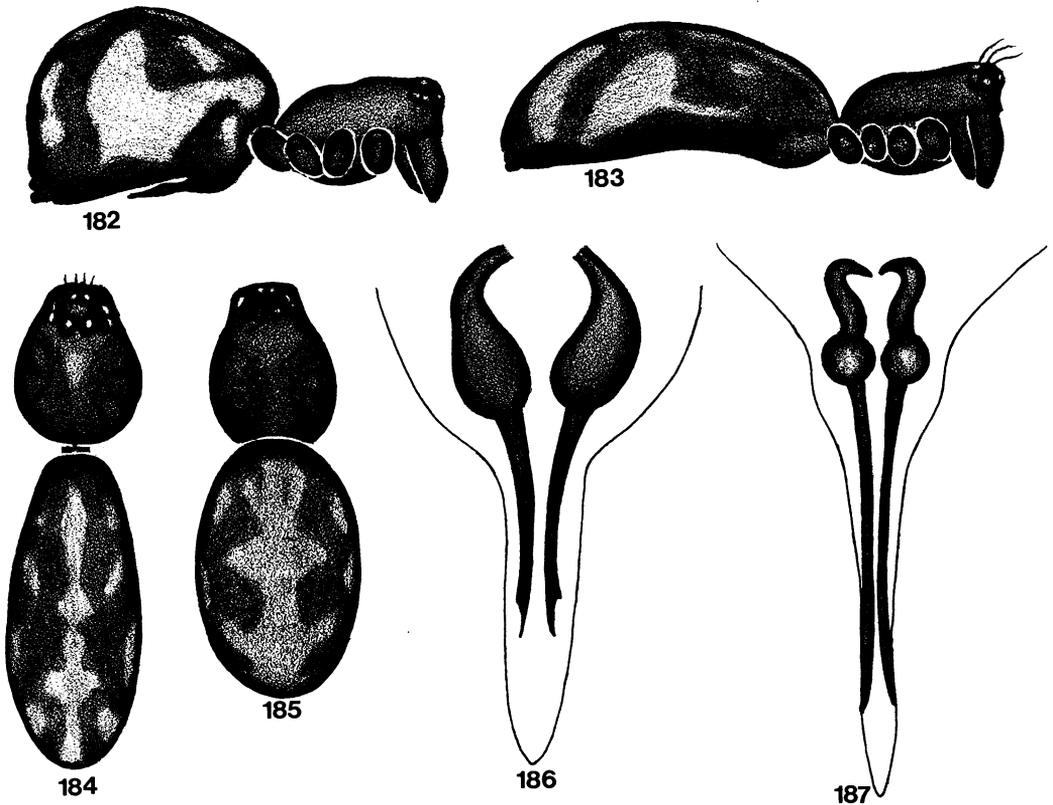
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species can be separated from its congeners by the ridged, trichobothrium-bearing spurs on the male palpal tibia (figs. 177, 178) and the extremely broad epigynal lobe of females (fig. 181).

MALE: Total length 2.23. Carapace 1.23 long, 0.85 wide. Abdomen 1.00 long, 0.69 wide, 0.54 high. Leg lengths: I 8.62, II 5.93, III 3.70, IV 5.08. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.04, PLE

0.06; AME-AME 0.01, AME-ALE 0.06, PME-PME 0.04, PME-PLE 0.08, ALE-PLE 0.01; MOQ length 0.14, front width 0.09, back width 0.12. Clypeal height slightly more than three times AME diameter. Eyemound very small, anterior pair of bristles lacking, posterior pair short and stout, directed back along interocular surface. Cheliceral fang long, curved; strong prodistal and smaller retrodistal tooth, and further tooth near tip of fang. Carapace uniformly straw brown; abdomen pale with diffuse black shading except for dark longitudinal midventral band extending from epigastric groove to spinnerets. Palp 1.08 long; tibia with small distodorsal mound bearing basal bristle and two prodorsal ridged trichobothrial spurs in addition to two normal trichobothria on middorsal surface (figs. 177, 178); distal apophyses of bulb angular (figs. 175, 176); paracymbium excavation deep (fig. 179).

FEMALE: Total length 1.65. Carapace 0.77 long, 0.62 wide. Abdomen 0.92 long, 0.77 wide, 0.85 high. Leg lengths: I 6.16, II 2.62, III 3.47, IV 3.47. Eye sizes and interdistances: AME 0.10, ALE 0.08, PME 0.08, PLE 0.08; AME-AME 0.01, AME-ALE 0.06, PME-PME 0.07, PME-PLE 0.10, ALE-PLE 0.01; MOQ length 0.29, front width 0.21, back width 0.23. Clypeal height twice AME diameter. Chelicerae 0.31 long, fang short; two teeth on promargin, one on retromargin. Carapace pale yellow with darker band extending from eyes to thoracic groove; abdo-



Figs. 182–187. 182–186. *Pahoroides whangarei*, new species. 187. *P. courti*, new species. 182. Female, lateral view. 183. Male, lateral view. 184. Male, dorsal view. 185. Female, dorsal view. 186, 187. Female epigynum, dorsal views.

men with anterodorsal surface evenly shaded, posterior half pale with median band, venter evenly shaded with thin pale lateral lines. Epigynal lobe shorter and broader than in South Island species (fig. 181).

OTHER MATERIAL EXAMINED: One male taken with the types (OMD) and one male taken at Waitapu, Taranaki, North Island, New Zealand, on Sept. 4, 1966 (R. W. Hutton, OMD).

DISTRIBUTION: Known only from the Mount Egmont region, Taranaki, North Island, New Zealand.

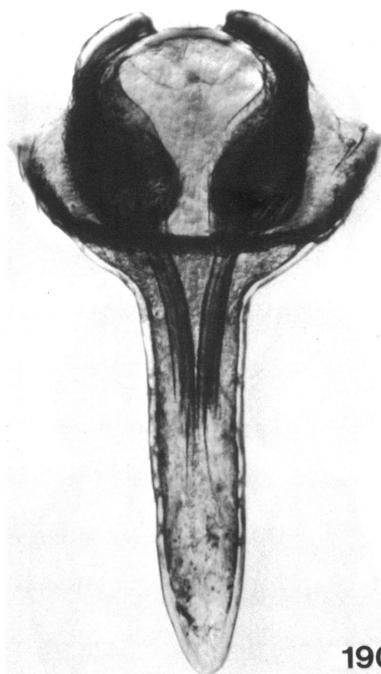
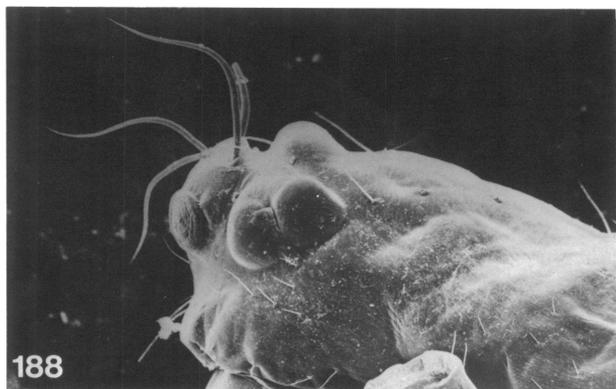
PAHOROIDES FORSTER, NEW GENUS

TYPE SPECIES: *Pahoroides whangarei* Forster, new species.

ETYMOLOGY: The generic name indicates the relationship with *Pahora*, and is feminine in gender.

DIAGNOSIS: This genus seems closely related to *Pahora* but can be distinguished by the much more elongate epigynal lobe (figs. 182, 186, 187), the elongate male abdomen (figs. 183, 184), and the projection of the embolus and apophyses of the male palpal bulb well beyond the distal margin of the cymbium (fig. 195).

DESCRIPTION: Small (total length 2.5–3.5). Eyemound as in *Pahora*, with four macrosetae (fig. 188) arranged in two pairs as in *Pahora*, but secretory glands opening from single pores (rather than multipore pits of *Pahora*). AME and ALE similarly separated in both sexes (unlike *Pahora*). Chelicerae with both promarginal and retromarginal teeth (fig. 189). Male abdomen elongate, at least three times as long as wide (figs. 183, 184). Male palp with straight spiniform embolus originating near base of bulb, with prominent apophyses projecting well beyond tip of cym-



Figs. 188–190. *Pahoroides whangarei*, new species. 188. Ocular region of male, lateral view. 189. Chelicera, oblique medial view. 190. Epigynum, dorsal view.

bium (fig. 194). Epigynal lobe of female extending back from epigastric furrow to one-half or more of abdominal length (fig. 182); internal genitalia with two receptacula (figs. 186, 187).

DISTRIBUTION: Known only from the northern half of the North Island of New Zealand.

Pahoroides whangarei Forster,
new species

Figures 182–186, 188–197

TYPES: Male holotype and allotype female taken from bowl webs on tree trunks at Coronation Park, Whangarei, Northland, North Island, New Zealand (Feb. 6, 1981; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species can be distinguished from *P. courti* by the apically bifurcate distoventral process of the palpal bulb (figs. 194–197) and the bulbous receptacula of females (fig. 186).

MALE: Total length 2.63. Carapace 0.85 long, 0.54 wide. Abdomen 1.69 long, 0.54 wide, 0.46 high. Leg lengths: I 12.86, II 7.85, III 5.01, IV 7.16. Eye sizes and interdistances: AME 0.03, ALE 0.04, PME 0.04, PLE 0.04; AME-AME 0.03, AME-ALE 0.04, PME-PME 0.04, PME-PLE 0.04, ALE-PLE 0.01; MOQ length 0.15, front width 0.09, back width 0.12. Clypeal height three times AME diameter. Eyemound low, with four hairs; secretory pores few, single, limited to



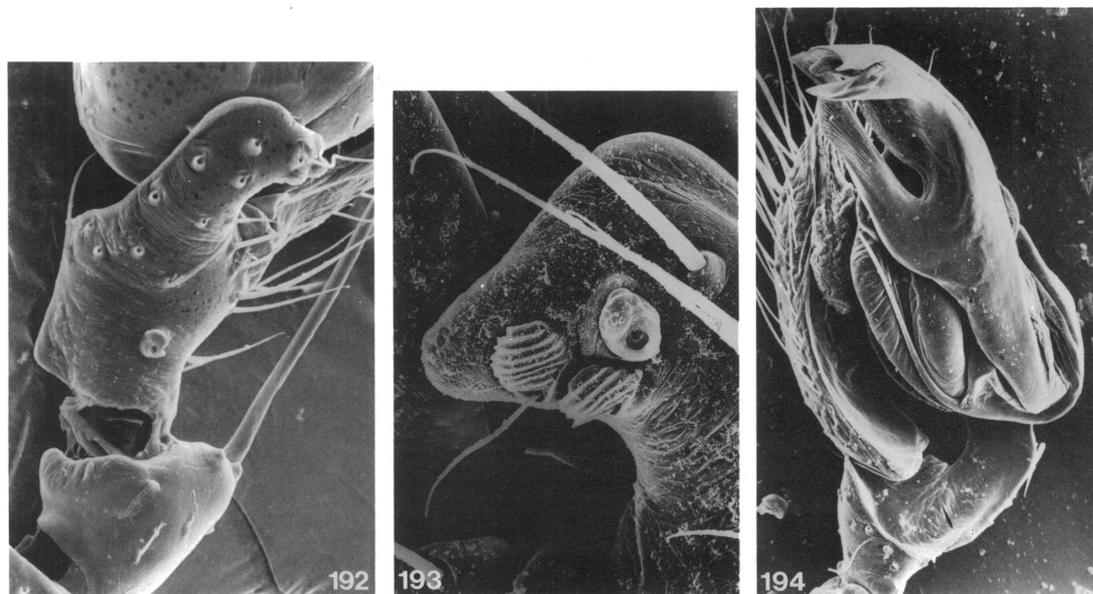
Fig. 191. *Pahoroides whangarei*, new species, webs above sheet web of *Cambridgea* sp.

clypeal surface below AME. Chelicerae short, 0.39 long, vertical, with four teeth on pro-margin, one on retromargin. Coloration as in figures 183, 184. Palp 1.31 long; tibia with strong retrodistal projection bearing three subdistal trichobothria of which two have ridged bases (figs. 192, 193); paracymbial excavation elongate; bulb elongate (figs. 194–197).

FEMALE: Total length 1.97. Carapace 0.85 long, 0.54 wide. Abdomen 1.26 long, 0.81 wide, 0.81 high. Leg lengths: I 10.47, II 6.70, III 4.24, IV 6.31. Eye sizes, interdistances, and clypeus height as in male. Coloration as in figures 182, 185. Epigynal lobe extremely slender, extending back to point midway between epigastric furrow and spinnerets (fig. 182); shape and internal genitalia as in figures 187, 190.

OTHER MATERIAL EXAMINED: NEW ZEA-

LAND: North Island: Northland: Coronation Park, Whangarei, Feb. 6, 1981, bowl webs on tree trunks and also attached to knock-down threads above the sheetweb of *Cambridgea foliata* (R. R. Forster, OMD, AMNH), 8♂, 19♀; E Kaikohe, Aug. 21, 1953, sweeping, kauri forest (B. J. Marples, OMD), 1♂, 1♀; Kaitaia, Jan. 30, 1981 (R. R. Forster, OMD), 4♀; Mair Park, Whangarei, Jan. 8, 1967 (R. R. Forster, OMD), 1♀; Mangamuka, Jan. 31, 1981 (R. R. Forster, OMD), 1♂, 11♀; Mangimangina Reserve, near Kaikohe, Jan. 30, 1981 (R. R. Forster, OMD), 4♂, 15♀; The Skyline, Kohukohu, Aug. 28, 1953 (B. J. Marples, OMD), 2♂, 2♀; Te Matua, Ngahere, Waipoua State Forest, Feb. 4, 1975, sweeping undergrowth, kauri forest (A. K. Walker, EDA), 1♂; Toronui Trig, Waipoua State Forest, Apr. 15, 1980, elev. 150 m, decaying nikau palm leaf bases and litter underneath (A.



Figs. 192–194. *Pahoroides whangarei*, new species, male palp. 192, 193. Palpal tibia, retrolateral views. 194. Right palp, ventral view.

Newton, M. Thayer, AMNH), 2♂, 4♀, elev. 150 m, pyrethrum fogging, fungus on log, kauri-podocarp-broadleaf-nikau palm forest (A. Newton, M. Thayer, AMNH), 4♀; Wai-kohatu Bridge, Waipoua State Forest, Apr. 11–14, 1980, pyrethrum fogging, agathis-podocarp-broadleaf forest (A. Newton, M. Thayer, AMNH), 2♀; Waipoua Forest, Jan. 20, 1981 (R. R. Forster, OMD), 1♂, 4♀; Wairau Summit, Waipoua State Forest, Apr. 11–14, 1980, pyrethrum fogging, podocarp-mixed broadleaf forest (A. Newton, M. Thayer, AMNH), 1♂, 1♀; Yakas Tree Trig, Waipoua State Forest, Apr. 11–14, 1980, elev. 350 m, pyrethrum fogging, metrosideros trunk, broadleaf-podocarp forest (A. Newton, M. Thayer, AMNH), 4♀.

DISTRIBUTION: Known only from Northland, North Island, New Zealand.

Pahoroides courti Forster,
new species

Figures 187, 198, 199

TYPES: Male holotype from Te Tapui Scenic Reserve, Auckland, North Island, New Zealand (Aug. 20, 1984; D. J. Court), and female allotype from rimu-tawa forest at Lake Okataina, Auckland, North Island, New Zea-

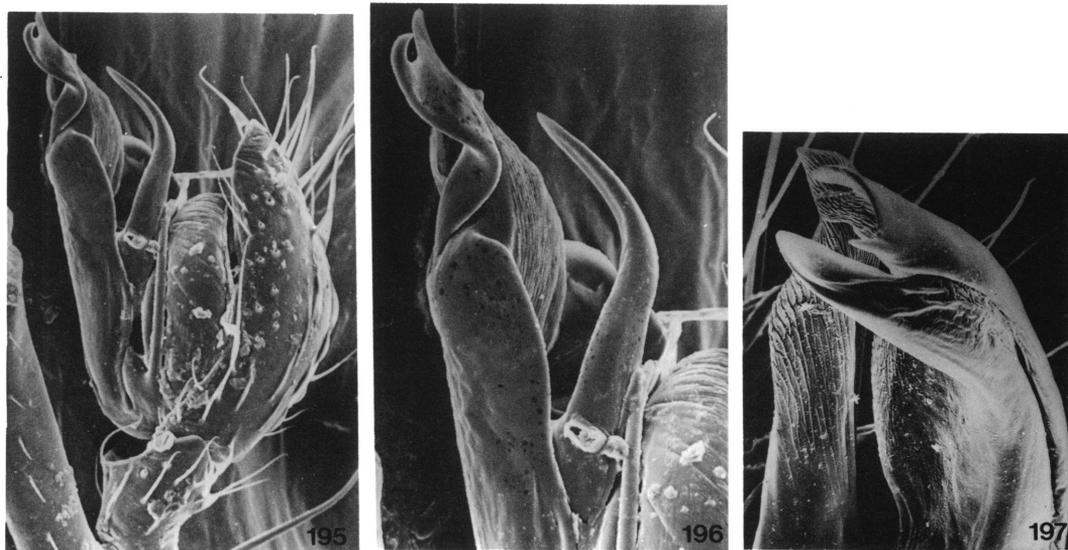
land (Oct. 20, 1984; D. J. Court), deposited in OMD.

ETYMOLOGY: The specific name is a patronym in honor of the collector of the types.

DIAGNOSIS: This species can be distinguished from *P. whangarei* by the undivided distoventral process on the male palp (fig. 198) and the longer, more slender epigynal scape of females (figs. 187, 199).

MALE: Total length 2.53. Carapace 0.59 long, 0.53. Abdomen 1.98 long, 0.73 wide, 0.69 high. Leg lengths: I missing, II 8.01, III 4.77, IV 7.08. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.03, AME-ALE 0.06, PME-PME 0.07, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.18, front width 0.11, back width 0.19. Clypeal height twice AME diameter. Eyemound small, with four hairs. Carapace uniformly pale yellow-brown; abdomen white with black shading above spinnerets and on venter. Palp 1.08 long; distoventral process (broken off the palp illustrated, fig. 198) strong but narrow plate extending beyond more dorsal process as in *P. whangarei* but not distally bifurcate as in that species; distal apophysis greatly elongated (fig. 198).

FEMALE: Total length 1.79. Carapace 0.62



Figs. 195-197. *Pahoroides whangarei*, new species, right male palp, retrolateral and ventral views.

long, 0.54 wide. Abdomen 1.16 long, 0.85 wide, 0.92 high. Leg lengths: I 9.47, II 5.47, III 3.23, IV 5.62. Eye sizes and interdistances as in male except AME slightly closer to ALE. Coloration as in male. Epigynal scape long, slender, extending nearly to spinnerets; receptacula rounded (figs. 187, 199).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Auckland:* Cuvier Island, June 1943 (R. R. Forster, OMD), 1♂, 1♀; Manuwera, May 29, 1943 (R. R. Forster, OMD), 1♀; Titirangi, Dec. 12, 1945 (R. R. Forster, OMD), 1♂; Waitakere Ranges, Feb. 8, 1949 (R. R. Forster, OMD), 1♀; Whale Island, Jan. 4, 1986 (D. J. Court, OMD), 1♀.

DISTRIBUTION: Known only from the northern North Island, from Auckland City south to Hawkes Bay.

WAIKURIA FORSTER, NEW GENUS

TYPE SPECIES: *Wairua reinga* Forster, new species.

ETYMOLOGY: The generic name is the Maori word for spirit and relates to Maori mythology referring to Cape Reinga. It is feminine in gender.

DIAGNOSIS: Females are easily recognized by the highly coiled epigynal ducts (figs. 202, 203); males have numerous hairs on the eyemound and a single, very short macroseta on the palpal tibia (fig. 204).

DESCRIPTION: Relatively large (total length 3.5-5.0). Eyemound small but furnished with numerous hairs. First pair of legs of male extremely long, almost twice length of second pair. Male abdomen elongate. Palpal bulb with strong curved embolus. Epigynum a simple mound, internal genitalia with long coiled ducts.

DISTRIBUTION: Known only from the North Island of New Zealand.

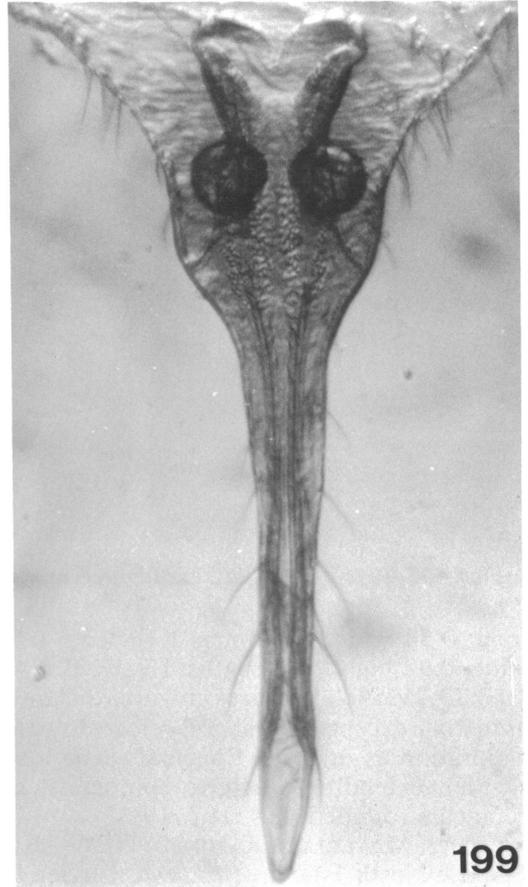
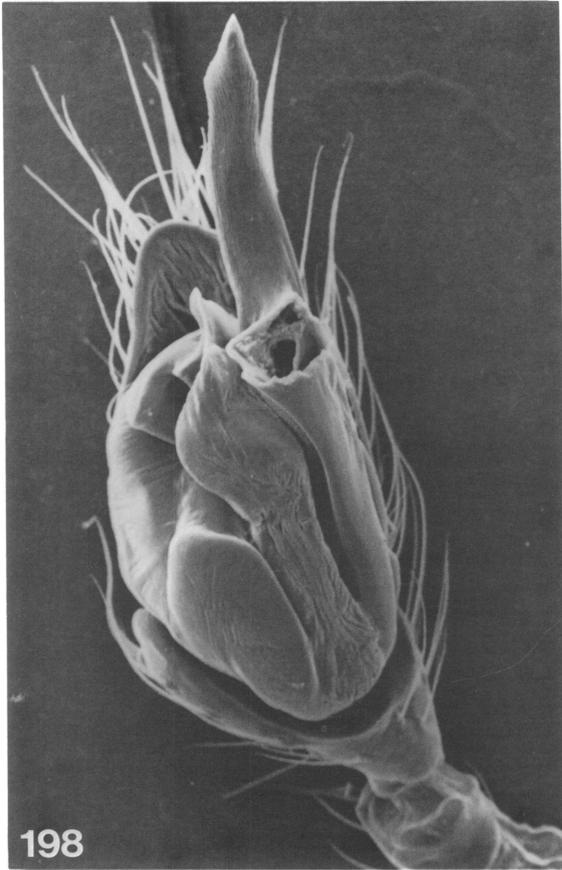
***Wairua reinga* Forster, new species Figures 200-202**

TYPE: Male holotype taken from large shee-tweb on tree trunk in small patch of forest at Cape Reinga, Northland, North Island, New Zealand (Jan. 7, 1967; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species can be distinguished from *W. waikanae* by the absence of a denticulate process on the male palpal bulb (figs. 200, 201) and the posteriorly situated receptacula of females (fig. 202).

MALE: Total length 4.63. Carapace 1.23 long, 1.08 wide. Abdomen 2.39 long, 0.92 wide, 0.90 high. Leg lengths: I 24.64, II 13.55, III 6.78, IV 12.78. Eye sizes and interdistances: AME 0.07, ALE 0.10, PME 0.07, PLE



Figs. 198, 199. *Pahoroides courti*, new species. 198. Male palp, ventral view. 199. Epigynum, dorsal view.

0.10; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.09, PME-PLE 0.09, ALE-PLE 0.02; MOQ length 0.24, front width 0.17, back width 0.23. Clypeal height twice AME diameter; pars thoracica raised behind thoracic groove to height of pars cephalica. Eye-mound small, with transverse row of six hairs in front and more irregularly placed hairs behind. Chelicerae 0.46 long, promargin with three teeth, retromargin with one. Carapace pale brown with V-shaped dark patch in front of thoracic groove and faint shading on lateral margins; dorsal and lateral surfaces of abdomen closely speckled with small black patches, ventral surface pale. Palp 1.16 long, bulb with three smooth ventral processes (figs. 200, 201).

FEMALE: A single female collected with the

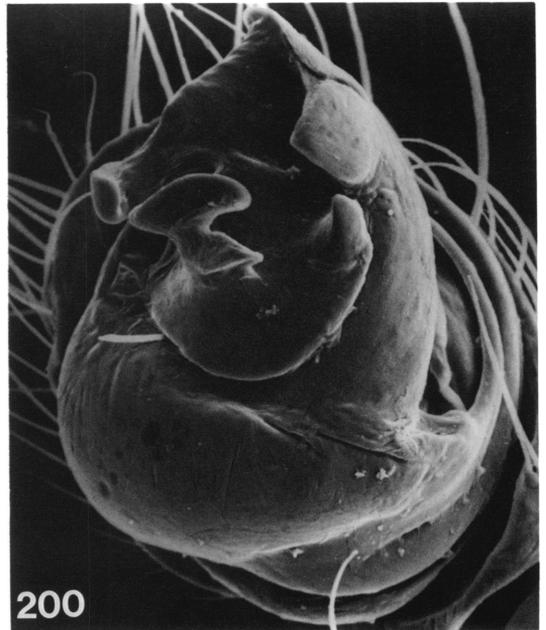
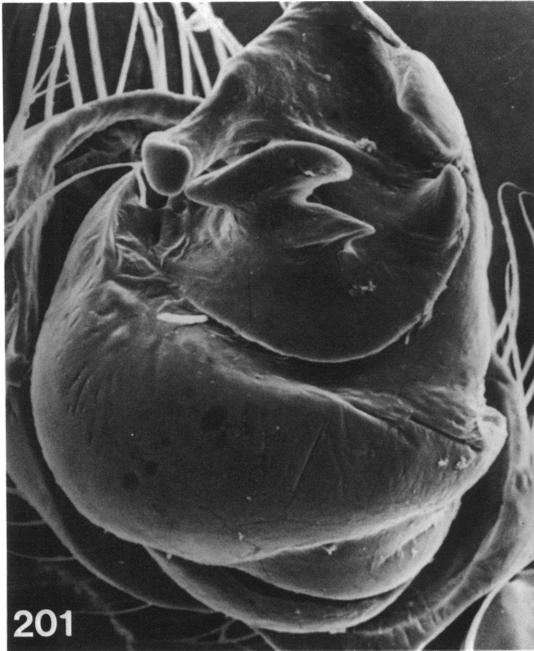
holotype was mangled during capture; only the internal genitalia were recovered. These are strikingly diagnostic, with receptacula situated posteriorly and distally coiled anterior ducts (fig. 202).

OTHER MATERIAL EXAMINED: A single damaged female collected with the holotype.

DISTRIBUTION: The species appears to be limited to the very far north of the North Island of New Zealand.

Wairua waikanae Forster,
new species
Figures 203–206

TYPES: Female holotype and male allotype beaten from shrubs in forest at Waikanae, Wellington, North Island, New Zealand (Jan. 3, 1948; R. R. Forster), deposited in NMW.



Figs. 200, 201. *Wairua reinga*, new species, right male palp, ventral and oblique prolateral views.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species can be easily distinguished from *W. reinga* by the denticulate process on the male palpal bulb (figs. 205, 206) and the anteriorly situated female receptacula (fig. 203).

MALE: Total length 4.79. Carapace 1.69 long, 1.31 wide. Abdomen 3.08 long, 1.23 wide, 1.31 high. Leg lengths: I 22.41, II 11.78, III 6.85, IV 11.32. Eye sizes and interdistances as in female. Clypeal height twice AME diameter. Eyemound small, with numerous hairs. Abdomen with numerous black spots and white patches on dorsal and lateral surfaces, venter pale. Palp 1.54 long; tibia with small dorsal mound bearing one trichobothrium and broad retrolateral lobe at tip with short macroseta (fig. 204); bulb with denticulate process (figs. 205, 206).

FEMALE: Total length 3.64. Carapace 1.31 long, 1.16 wide. Abdomen 2.31 long, 1.77 wide, 1.77 high. Leg lengths: I 11.12, II 10.24, III 5.62, IV 8.32. Eye sizes and interdistances: AME 0.06, ALE 0.10, PME 0.08, PLE 0.10; AME-AME 0.03, AME-ALE 0.06,

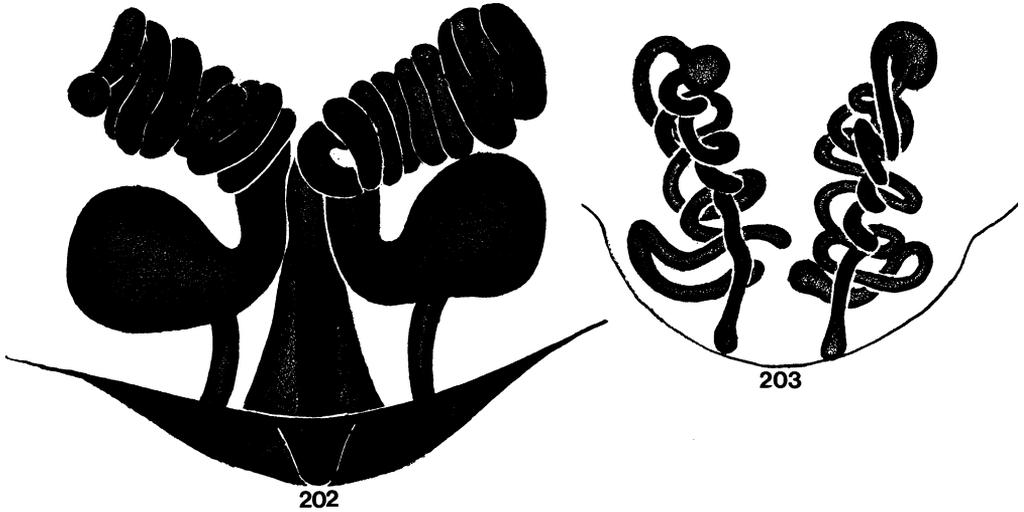
PME-PME 0.07, PME-PLE 0.06, ALE-PLE 0.02; MOQ length 0.21, front width 0.15, back width 0.23. Clypeal height twice AME diameter. Eyemound represented by slight swelling present behind AME, with few hairs. Chelicerae 0.62 long, vertical. Carapace yellow-brown; abdomen speckled with black on dorsal and lateral surfaces, ventral surface pale. Epigynum a prominent broad mound projecting down below surface of abdomen, extending short distance beyond epigastric furrow; internal genitalia (fig. 203) with coiled ducts on each side leading to and from small, anteriorly situated spherical receptacula.

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Wellington:* Wilton's Bush, Sept. 8, 1946 (G. W. Ramsay, OMD), 1♂.

DISTRIBUTION: The species appears to be limited to the environs of Wellington City, North Island, New Zealand.

NOMAUA FORSTER, NEW GENUS

TYPE SPECIES: *Bolyphantes crinifrons* (Urquhart).



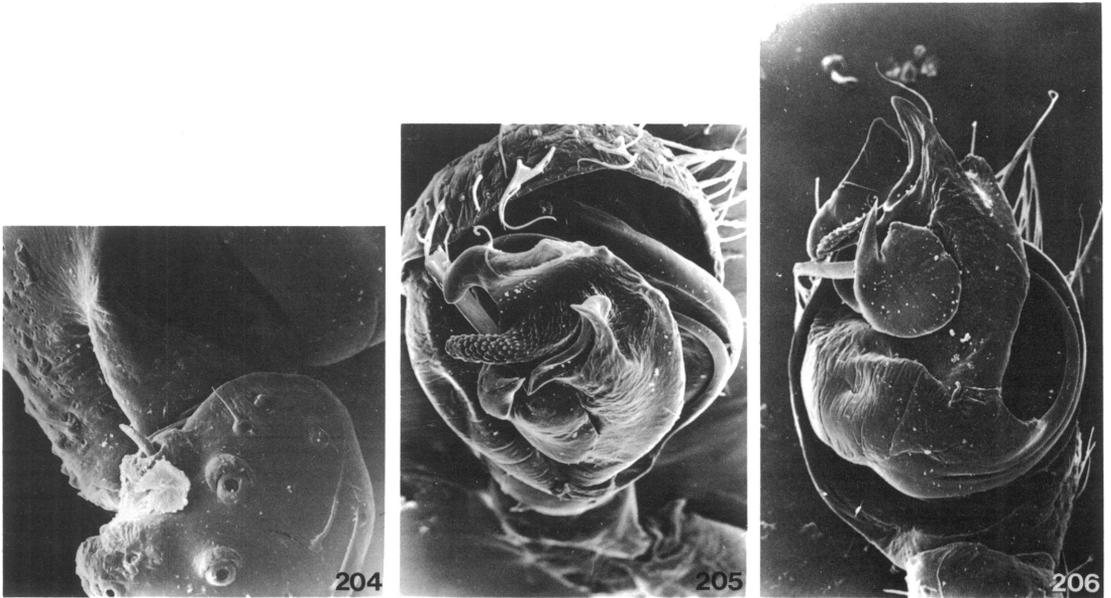
Figs. 202, 203. Female epigynum, dorsal views. 202. *Wairua reinga*, new species. 203. *W. waikanae*, new species.

ETYMOLOGY: The generic name is an arbitrary combination of letters considered feminine in gender.

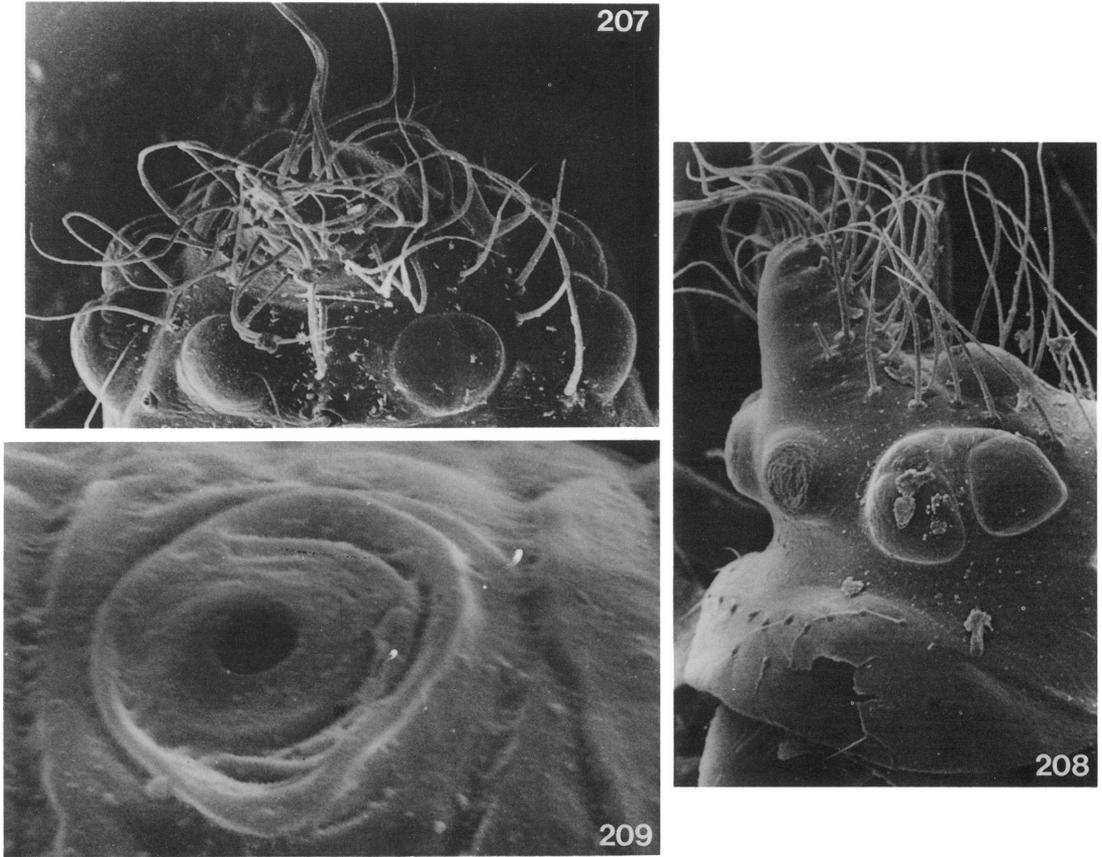
DIAGNOSIS: Females can be recognized easily by the conformation of the epigynal ducts (figs. 224, 225, 229); males have a stout or small (though longer than in *Wairua*) macro-

seta (figs. 211, 215), a spur (fig. 227), or only long macrosetae on the palpal tibia.

DESCRIPTION: Medium-size (total length 3–5). Eyemound usually well developed in male, with numerous hairs (more than the four characteristic of *Pahora* and *Pahoroides*). Multipore secretory pits present on clypeus



Figs. 204–206. *Wairua waikanae*, new species, right male palp. 204. Tibia and paracymbial area, retrolateral view. 205. Bulb, distal view. 206. Bulb, ventral view.



Figs. 207–209. *Nomaua crinifrons* (Urquhart), male. 207. Ocular area, dorsal view. 208. Ocular area, lateral view. 209. Tarsal organ, dorsal view.

and eyemound of male. Male abdomen usually more elongate than that of female. Colulus triangular, with two hairs. Epigynum small but distinct, not developed as in *Runga*, without mound or lobe as in *Pahora* and *Wairua*; two or four receptacula with ducts leading directly to external openings near margin of epigastric furrow.

DISTRIBUTION: Known only from south of Auckland on the North Island, and the north-west corner of the South Island, of New Zealand; one questionably placed species (*N. arborea*) occurs in Fiordland.

Nomaua crinifrons (Urquhart),
new combination

Figures 207–214, 216, 217

Cornicularia crinifrons Urquhart, 1891: 155 (male holotype from Stratford, Taranaki, North Is-

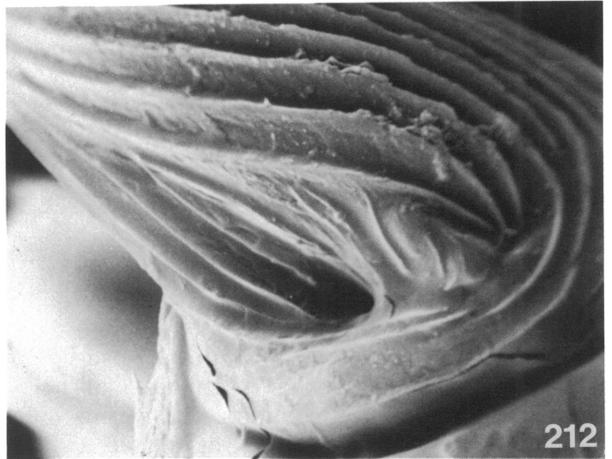
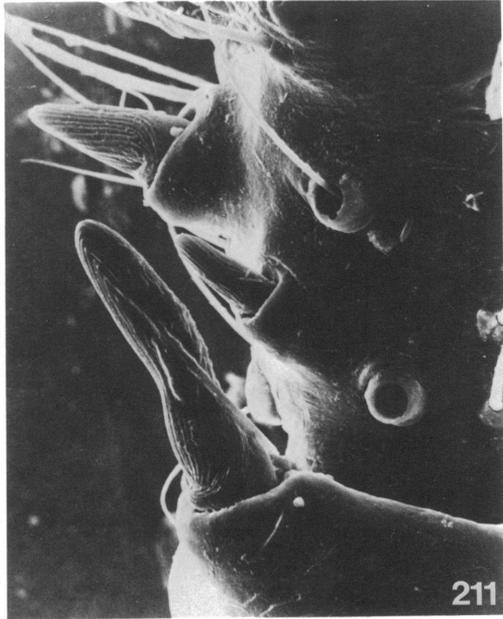
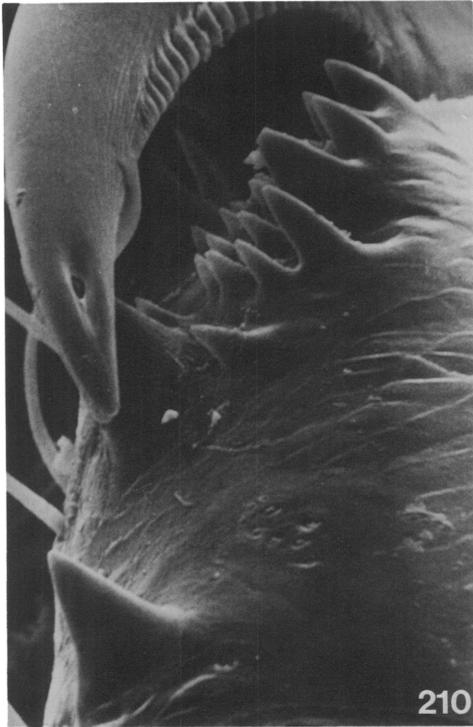
land, New Zealand, not in Urquhart collection, lost).

Synotaxus crinifrons: Simon, 1894: 662.

Bolyphantes crinifrons: Dalmas, 1917: 365.

DIAGNOSIS: Males can be recognized by the pore-bearing distal macroseta on the palpal tibia (figs. 211, 212), females by the single pair of receptacula on short ducts (fig. 217).

MALE: Total length 4.21. Carapace 1.46 long, 0.46 wide. Abdomen 2.70 long, 1.16 wide, 1.23 high. Leg lengths: I 21.41, II 12.71, III 6.78, IV 10.70. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.03, AME-ALE 0.08, PME-PME 0.10, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.24, front width 0.15, back width 0.27. Clypeal height almost three times AME diameter. Eyemound relatively high, conical, with numerous hairs (figs. 207,

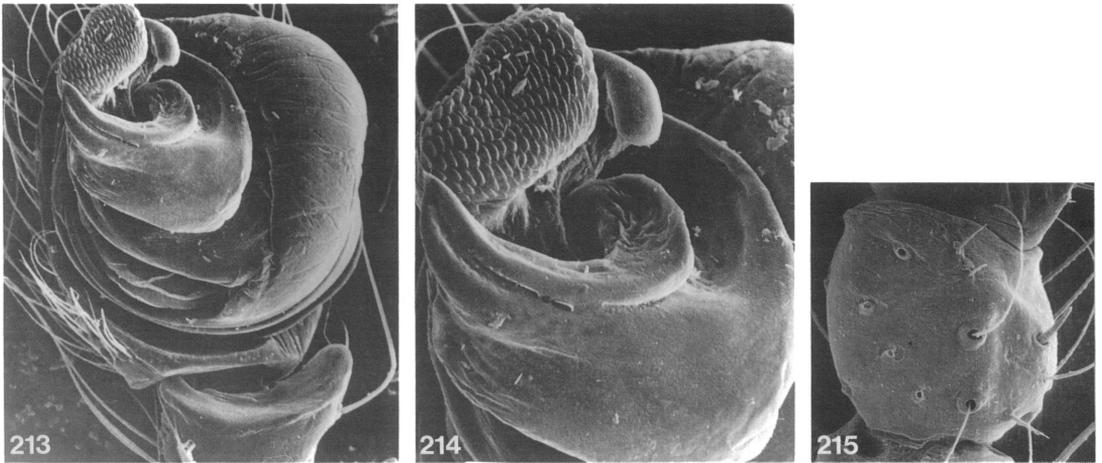


Figs. 210–212. *Nomaua crinifrons* (Urquhart), male. **210.** Chelicera, posterior view. **211.** Right male palpal patella and tibia, retrolateral view. **212.** Macroseta from palpal tibia, retrolateral view, showing basal pore.

208). Chelicerae 0.43 long, with four pro-marginal teeth and single tooth on proximal retromargin beyond tip of fang (fig. 210). Carapace with dark band on midline from eyes to posterior margin and irregular dark patches on lateral margins; dorsal and lateral surfaces of abdomen speckled with black and white patches (fig. 216), ventral surface pale except for faint median band extending from epigastric furrow to spinnerets. Palp 1.46 long;

patella with short but stout distodorsal macroseta (fig. 211); tibia with two macrosetae, distal one with basal pore (figs. 211, 212); bulb with large denticulate process (figs. 213, 214).

FEMALE: Total length 3.61. Carapace 1.39 long, 1.00 wide. Abdomen 2.23 long, 1.69 wide, 1.62 high. Leg lengths: I 18.87, II 10.16, III 5.47, IV 10.09. Eye sizes and interdistances as in male. Coloration as in male but



Figs. 213–215. **213, 214.** *Nomaua crinifrons* (Urquhart), male palp, ventral views. **215.** *N. nelson*, new species, male palpal tibia, retrolateral view.

black abdominal patches smaller. Epigynum weakly developed as small bilobed thickening on epigastric margin; internal genitalia with two receptacula on short ducts (fig. 217).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Manawatu:* Feilding, Dec. 26, 1949 (R. R. Forster, OMD), 1♂; Totara Reserve, Pohangina Valley, Jan. 20, 1981 (R. R. Forster, OMD), 1♂; Vinegar Hill Reserve, Dec. 18, 1948, low shrubs in forest (R. R. Forster, OMD), 1♀, Jan. 10, 1974 (R. R. Forster, OMD), 5♂, 2♀.

DISTRIBUTION: All specimens examined come from a small area in the Manawatu, south of the type locality, but the species probably has the same distribution as the sympatric *M. perdita*.

Nomaua perdita Forster,
new species
Figures 218–220

TYPES: Male holotype and female allotype beaten from shrubs in podocarp forest at Vinegar Hill Reserve, Manawatu, North Island, New Zealand (Jan. 6, 1967; R. R. Forster), deposited in OMD.

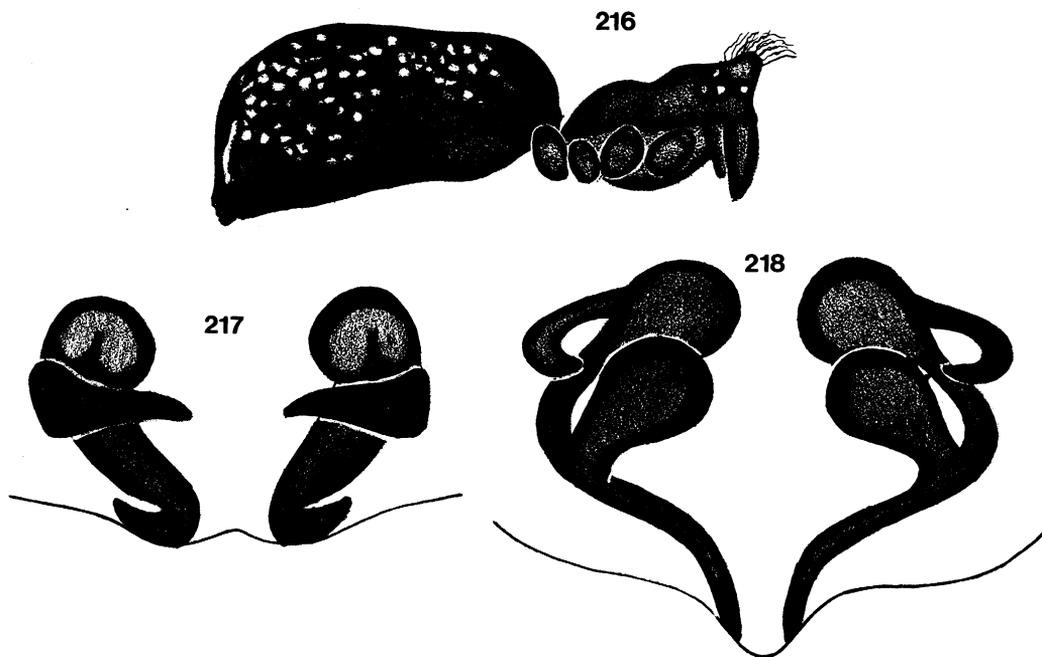
ETYMOLOGY: The specific name is from the Latin, meaning profligate.

DIAGNOSIS: This species is characterized by the prolaterally protuberant embolus of males (fig. 220) and the four closely spaced receptacula (fig. 218).

MALE: Total length 4.02. Carapace 1.23 long, 1.16 wide. Abdomen 2.77 long, 0.92 wide, 1.16 high. Leg lengths: I 23.56, II 14.01, III 7.32, IV 12.55. Eye sizes and interdistances: AME 0.10, ALE 0.08, PME 0.08, PLE 0.08; AME-AME 0.03, AME-ALE 0.03, PME-PME 0.10, PME-PLA 0.07, ALE-PLA 0.02; MOQ length 0.33, front width 0.23, back width 0.26. Clypeal height twice AME diameter. Eyemound low, with small tuft of hair. Chelicerae 0.52 long. Carapace with triangular dark patch, apex at thoracic groove, ending midway between eyes and thoracic groove; abdomen mottled with black and white patches on dorsal and lateral surfaces, venter pale. Palp short, 0.85 long; patella and tibia without stout macrosetae; paracymbium triangular (fig. 219); embolus strongly produced from bulb prolaterally (fig. 220).

FEMALE: Total length 3.14. Carapace 1.31 long, 0.39 wide. Abdomen 1.85 long, 0.62 wide, 1.54 high. Leg lengths: I 15.48, II 8.70, III 5.16, IV 8.39. Eye sizes and interdistances as in male except AME relatively smaller; MOQ as wide behind as long. Coloration as in male. Epigynum with simple median projection; internal genitalia with paired, closely spaced receptacula (fig. 218).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Manawatu:* Feilding, Nov. 19, 1947, bushes in podocarp forest (R. R. Forster, OMD), 1♀, Dec. 25, 1949 (R. R. Forster, OMD), 1♀, Jan. 6, 1952 (R. R. Forster,



Figs. 216–218. 216, 217. *Nomaua crinifrons* (Urquhart), female. 218. *N. perditia*, new species. 216. Body, lateral view. 217, 218. Epigynum, dorsal views.

ter, OMD), 1♂, 1♀; Taupo, May 16, 1968 (R. W. Hutton, OMD), 1♀; Totara Reserve, Pohangina Valley, Jan. 20, 1967, shrubs in podocarp forest (R. R. Forster, OMD), 1♀; Vinegar Hill Reserve, Jan. 6, 1967, beating shrubs in podocarp forest (R. R. Forster, OMD), 3♀; Waitapu, Sept. 4, 1966 (R. W. Hutton, OMD), 3♀. *Taranaki*: Mount Egmont, Feb. 24, 1967 (C. L. Wilton, OMD), 1♀.

DISTRIBUTION: Known only from the North Island of New Zealand.

Nomaua waikaremoana Forster,
new species
Figure 224

TYPE: Female holotype beaten from shrubs in mixed forest at an elevation of 2600 ft on Panikiri Track, Waikaremoana, Hawkes Bay, North Island, New Zealand (Dec. 11, 1946; R. R. Forster), deposited in NMW.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species seems closely related to *N. perditia* but can be readily distin-

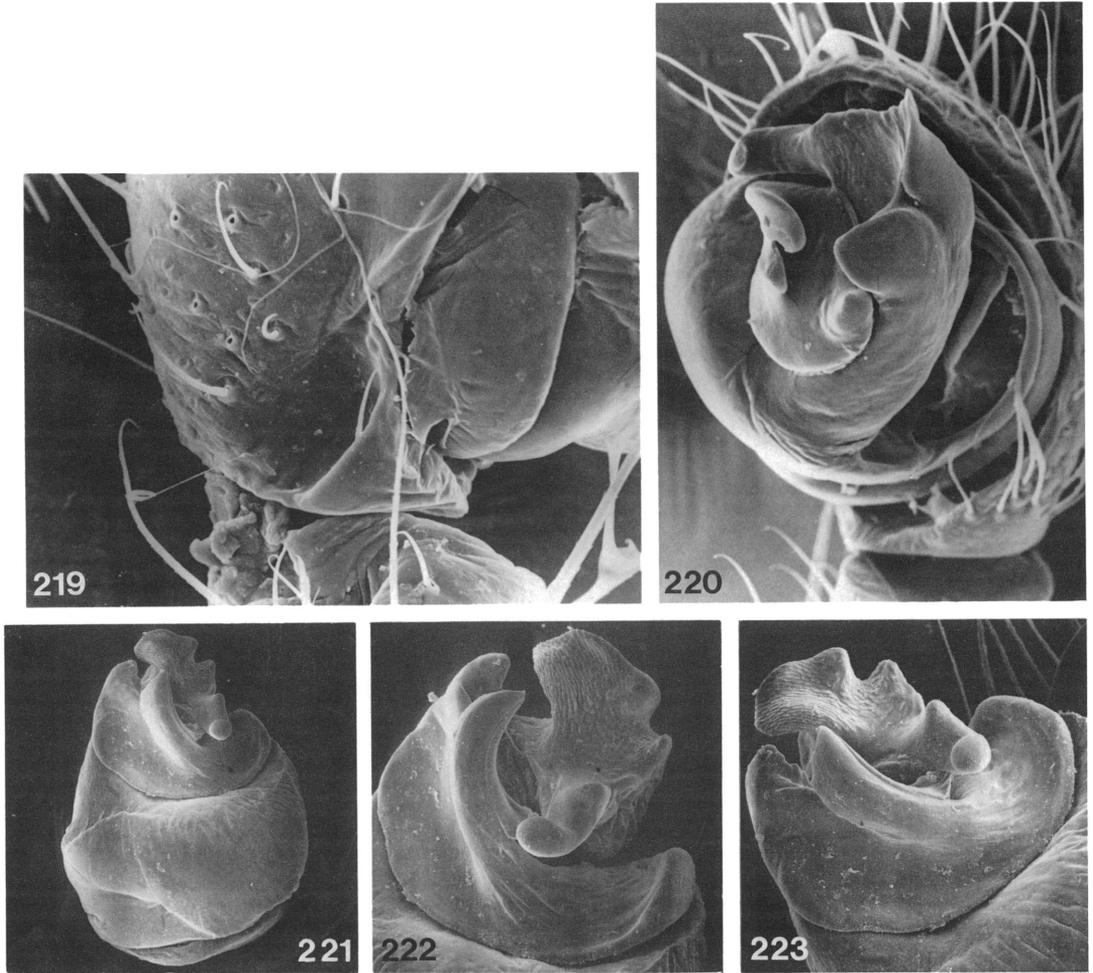
guished by the wide separation of the paired receptacula of the internal female genitalia (fig. 224).

MALE: Unknown.

FEMALE: Total length 3.62. Carapace 1.54 long, 1.16 wide. Abdomen 2.16 long, 1.77 wide, 1.77 high. Leg lengths: I 15.63, II 8.62, III 5.08, IV 8.70. Eye sizes and interdistances: AME 0.06, ALE 0.08, PME 0.07, PLE 0.08; AME-AME 0.04, AME-ALE 0.06, PME-PME 0.10, PME-PLE 0.07, ALE-PLE 0.02; MOQ length 0.24, front width 0.16, back width 0.24. Clypeal height three times AME diameter. Eyemound small, with numerous hairs. Chelicerae 0.58 long. Carapace pale brown with shading around eyes and extending back as median band to posterior margin; abdomen heavily shaded dorsally except for pale median band, venter pale. Internal genitalia (fig. 224) with two pairs of thick-walled receptacula, inner pair entering duct near external opening.

OTHER MATERIAL EXAMINED: A second female collected with the holotype (NMW).

DISTRIBUTION: Known only from Hawkes Bay, North Island, New Zealand.



Figs. 219–223. 219, 220. *Nomaua perditia*, new species, male. 221–223. *N. nelson*, new species, male. 219. Paracymbial area, retrolateral view. 220. Right palp, ventral view. 221–223. Right palpal bulb, ventral, prolateral, and oblique prolateral views.

Nomaua nelson Forster,
new species
Figures 215, 221–223, 225

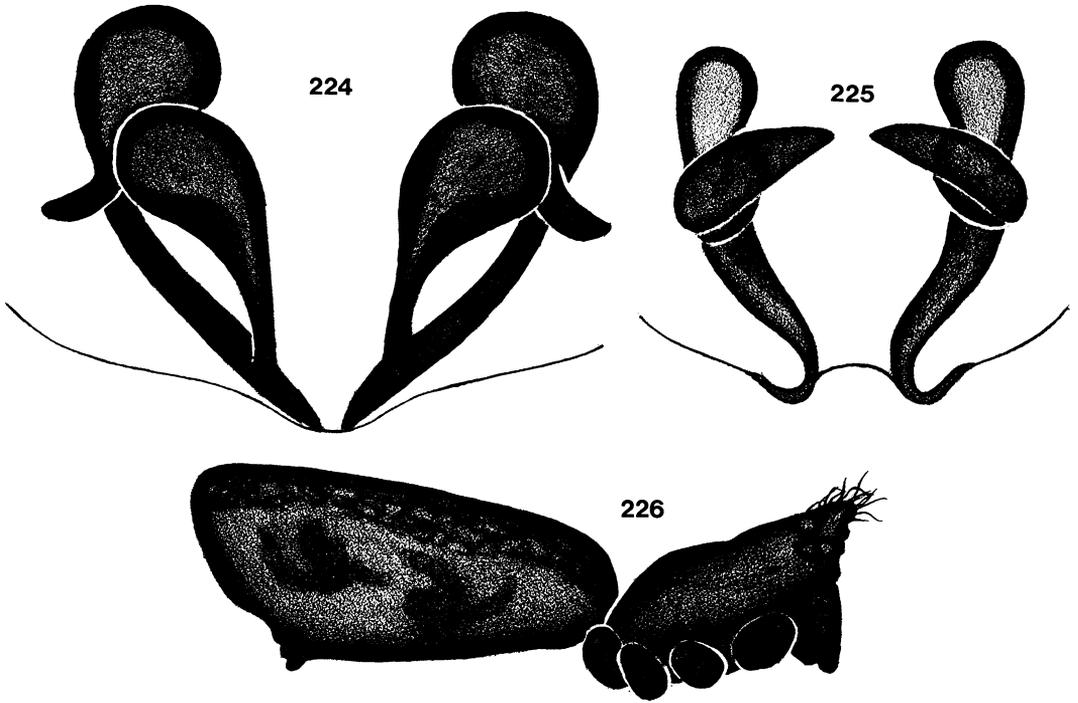
TYPES: Male holotype and female allotype collected by pyrethrum fogging of sooty fungus-covered *Nothofagus fusca* bark on St. Arnaud Track, Lake Rotoiti, Nelson Lakes District National Park, Nelson, South Island, New Zealand (Mar. 24–26, 1980; A. Newton, M. Thayer), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species seems closely related to *N. cauda* from the Wellington area

of the North Island, but can be separated by the different shape of the epigynum and shorter epigynal ducts (fig. 225) and by the absence of a rugose mound and the presence of a small macroseta on the male palpal tibia (fig. 215).

MALE: Total length 3.42. Carapace 1.21 long, 1.08 wide. Abdomen 2.16 long, 1.34 wide, 1.26 high. Leg lengths: I 16.80, II 9.90, III 4.11, IV 8.46. Eye sizes and interdistances: AME 0.09, ALE 0.09, PME 0.10, PLE 0.09; AME-AME 0.05, AME-ALE 0.06, PME-PME 0.09, PME-PLE 0.06, ALE-PLE 0.02; MOQ length 0.30, front width 0.24, back width 0.29. Clypeal height 2.5 times



Figs. 224–226. 224. *Nomaua waikaremoana*, new species, epigynum, dorsal view. 225. *N. nelson*, new species, same. 226. *N. arborea*, new species, male, lateral view.

AME diameter. Eyemound relatively low but broad, with numerous hairs. Chelicerae 2.80 long, with three promarginal and two retro-marginal teeth. Carapace pale brown with black triangular patch extending from midway behind eyes to thoracic groove, with point of triangle at thoracic groove; abdomen with distinct longitudinal pale band extending down dorsum, flanked by numerous small black spots extending down lateral margins; venter pale; chelicerae and sternum pale brown; legs brown with darker annulations on femora and tibiae. Palp 1.41 long; patella with long macroseta on anterior margin; tibia with small black macroseta on dorsal surface (fig. 215); bulb with robust apophyses (figs. 221–223).

FEMALE: Total length 3.06. Carapace 1.14 long, 0.90 wide. Abdomen 2.16 long, 1.80 wide, 1.62 high. Leg lengths: I 11.88, II 7.56, III 4.32, IV 7.38. Eye sizes and interdistances as in male. Small mound present behind AME, bearing few hairs. Coloration as in male but dorsal pale band on abdomen not as distinct. Epigynum a short lobe, deeply indented distally to form pair of lateral lobes; internal

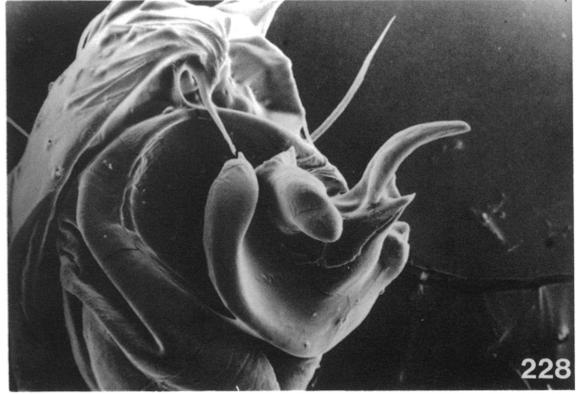
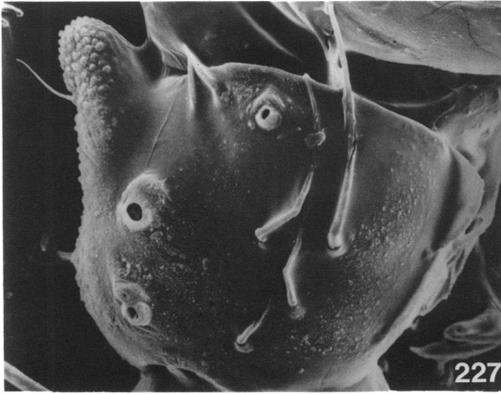
genitalia with narrow receptacula on posteriorly narrowed ducts (fig. 225).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Nelson:* Braeburn Track, Lake Rotoroa, Mar. 25–27, 1980, elev. 450 m, sooty mold on beech trunks (A. Newton, M. Thayer, AMNH), 4♀; N slope, Mount Robert, Mar. 23–26, 1980, elev. 860 m, pyrethrum fogging, beech bark (A. Newton, M. Thayer, AMNH), 1♂, 1♀; St. Arnaud Track, Lake Rotoiti, Nelson Lakes District National Park, Mar. 24–26, 1980, elev. 610–650 m, fine debris under bark of beech logs (A. Newton, M. Thayer, AMNH), 1♀, pyrethrum fogging, beech bark (A. Newton, M. Thayer, AMNH), 1♂, 4♀.

DISTRIBUTION: Known only from Nelson, North Island, New Zealand.

Nomaua cauda Forster,
new species
Figures 227–229

TYPES: Male holotype beaten from foliage at Waikanae, Wellington, North Island, New Zealand (Jan. 3, 1948; R. R. Forster), and



Figs. 227, 228. *Nomaua cauda*, new species, right male palp. 227. Tibia, retrolateral view. 228. Bulb, retrolateral view.

female allotype from Levin, Wellington, North Island, New Zealand (June 6, 1948; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is from the Latin *cauda* (tail).

DIAGNOSIS: This species can be distinguished from its congeners by the rugose lobe on the distodorsal surface of the male palpal tibia (fig. 227) and the laterally angular median epigynal ducts (fig. 229) of females.

MALE: Total length 4.94. Carapace 1.69 long, 1.46 wide. Abdomen 3.23 long, 1.31 wide, 1.39 high. Leg lengths: I 23.18, II 12.86, III 6.47, IV 10.63. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.04, AME-ALE 0.07, PME-PME 0.08, PME-PLE 0.06, ALE-PLE 0.02; MOQ length 0.24, front width 0.16, back width 0.22. Clypeal height three times AME diameter. Eyemound with numerous hairs, low but broad, extending across *pars cephalica* behind AME. Chelicerae 0.46 long, with one retromarginal and four promarginal teeth. Carapace pale brown with darker shading in ocular area and extending as band back to thoracic groove. Abdomen with irregular dark patches interspersed with smaller pale patches on dorsal and lateral surfaces, venter pale. Palp 1.04 long; tibia with granulate distodorsal lobe (fig. 227); bulb with protuberant apophyses (fig. 228).

FEMALE: Total length 3.29. Carapace 1.46 long, 1.00 wide. Abdomen 1.85 long, 1.77 wide, 1.62 high. Leg lengths: I 16.61, II 8.16, III 4.85, IV 8.39. Eyes smaller than in male but interdistances equivalent. Clypeal height

three times AME diameter. Eyemound small, with few hairs. Abdomen with distinct folium on dorsum composed of small black patches interspersed with white patches; venter with broad dark band extending from epigastric furrow to spinnerets. Internal genitalia with small receptacula and laterally angular median ducts (fig. 229).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **North Island:** *Wellington:* Kaihinui, Tararua Ranges, June 19, 1948, elev. 1500 ft (R. K. Dell, NMW), 1♀; Kapiti Island, May 1947 (R. R. Forster, OMD), 1♂, 2♀; Levin, June 6, 1948 (R. R. Forster, OMD), 2♀; *Wairarapa:* Inner Chetwode Island, Sept. 12, 1948 (J. T. Salmon, NMW), 1♀; Matahiwi, Mar. 5, 1967 (C. L. Wilton, OMD), 1♂; Middle Trio Island, Aug. 2, 1953, under stones (P. M. Johns, OMD), 1♀.

DISTRIBUTION: This species is limited to the southern part of the North Island of New Zealand.

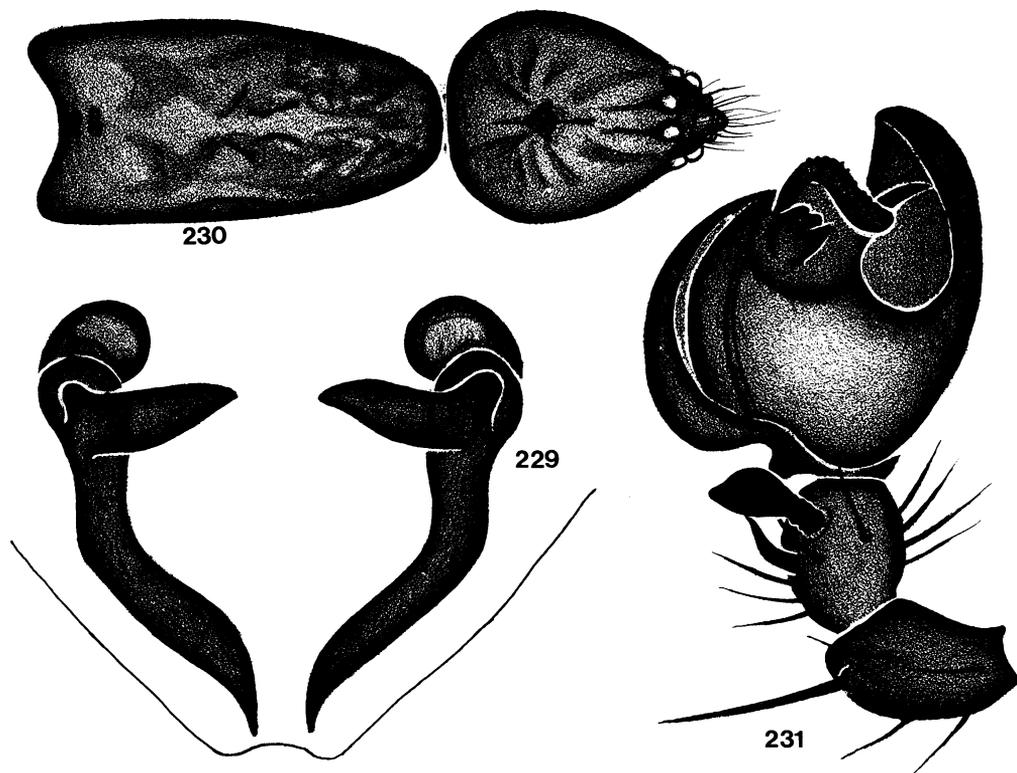
Nomaua arborea Forster,
new species

Figures 226, 230, 231

TYPE: Male holotype taken from moss on tree trunk at Caswell Sound, Fiordland, South Island, New Zealand (Apr. 13, 1949; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to the habitat of the type.

DIAGNOSIS: Males are clearly separated from those of all other species by the shape



Figs. 229–231. 229. *Nomaua cauda*, new species, epigynum, dorsal view. 230, 231. *N. arborea*, new species, male. 230. Body, dorsal view. 231. Right male palp, retrolateral view.

of the abdomen (figs. 226, 230) and the club-shaped macroseta on the male palpal tibia (fig. 231).

MALE: Total length 3.32. Carapace 1.32 long, 1.01 wide. Abdomen 2.02 long, 1.01 wide, 0.88 high. Leg lengths: I 20.60, II 12.29, III 6.68, IV 11.34. Eye sizes and interdistances: AME 0.10, ALE 0.13, PME 0.13, PLE 0.13; AME-AME 0.04, AME-ALE 0.11, PME-PME 0.11, PME-PLE 0.10, ALE-PLE 0.02; MOQ length 0.33, front width 0.24, back width 0.34. Clypeal height slightly less than twice AME diameter. Eyemound a distinct cone with numerous hairs (figs. 226, 230). Carapace uniformly yellow-brown; abdomen patterned as in figures 226, 230, uniquely shaped, broadly terminated behind, indented into pair of small posterior lobes. Palp 1.26 long; patella with strong distodorsal macroseta; tibia with two macrosetae, distal one strongly club-shaped; distal portion of palp elaborated ventrally (fig. 231).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Fiordland, South Island, New Zealand.

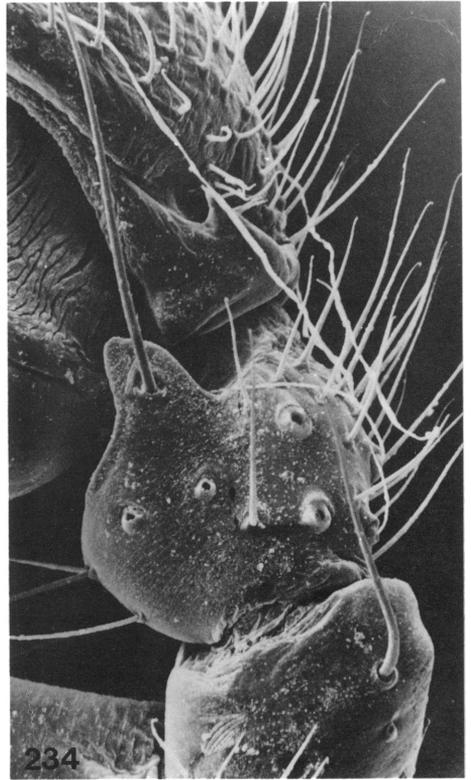
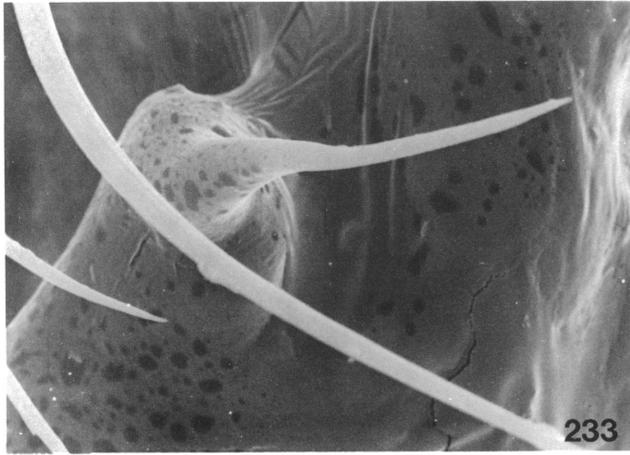
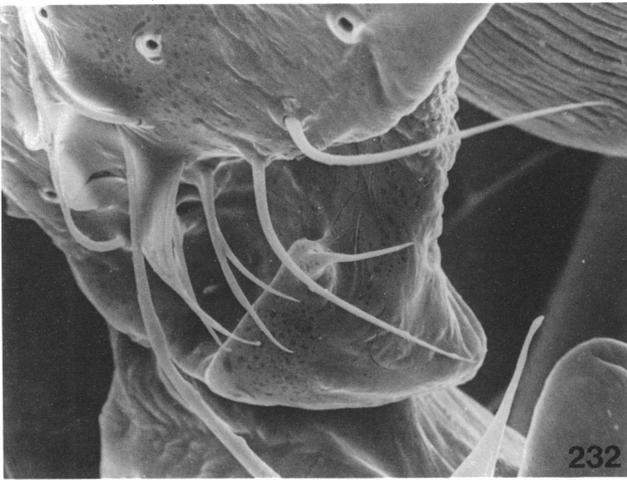
RUNGA FORSTER, NEW GENUS

TYPE SPECIES: *Runga nina* Forster, new species.

ETYMOLOGY: The generic name is taken from the Maori word *runga* (South), and is feminine in gender.

DIAGNOSIS: Members of this genus are large pahorines (total length over 3); females have a well-developed external epigynum (figs. 238, 240) and distinctive internal genitalia (see key above and figs. 239, 241), and males have an elongate, denticulate distal process (figs. 237, 244).

DESCRIPTION: Carapace only slightly longer than wide in both sexes. AME relatively large, not much smaller than other, subequal eyes;



Figs. 232–234. *Runga nina*, new species, male. 232, 233. Paracymbium of right palp, retrolateral view. 234. Tibia and paracymbium of left palp, retrolateral view.

MOQ much longer than wide in back. Clypeal height 2–3 times AME diameter, clypeus with numerous multipore secretory pits. Eyemound small but with numerous hairs (fig. 235). Leg formula 1423. Abdomen distinctly longer and more slender in males. Male palp with no modified trichobothria or stout macrosetae, tibia with distal projection; embolus strong, curved, spinous, originating basally; apophyses similar in all species, characterized by distal denticulate process. Epigynum relatively well developed; internal genitalia with paired receptacula on each side, smaller receptacula with distal secretory gland.

DISTRIBUTION: Southern half of the South Island of New Zealand.

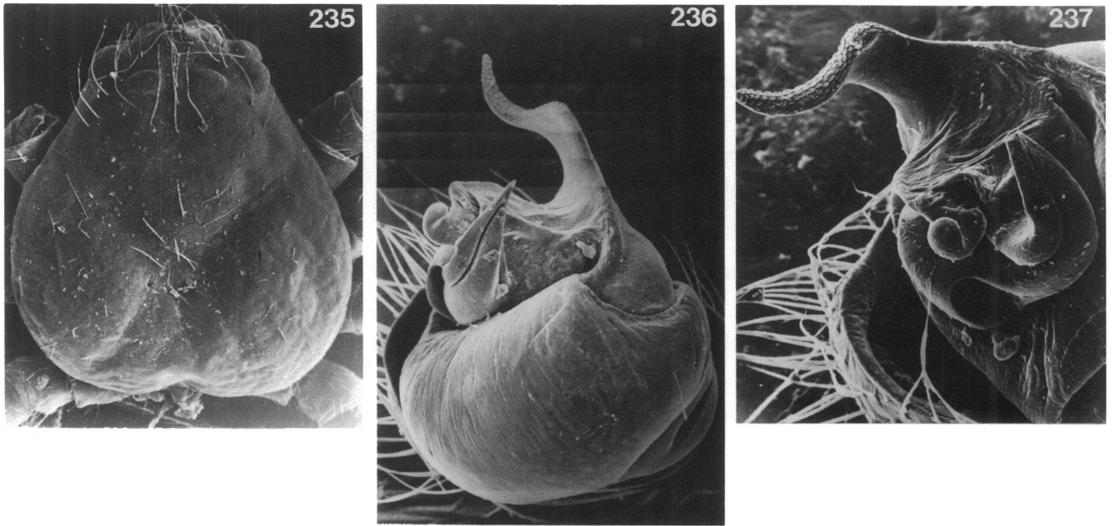
***Runga nina* Forster,**
new species
Figures 232–239

TYPES: Male holotype and female allotype taken from tree trunks at Gunn's Camp, Hollyford Valley, Fiordland, South Island, New Zealand (Feb. 6, 1986; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is an arbitrary combination of letters.

DIAGNOSIS: Males can be recognized by the spine on the palpal paracymbium (figs. 232, 233), females by the pronglike epigynal projections (fig. 238).

MALE: Total length 4.10. Carapace 1.69



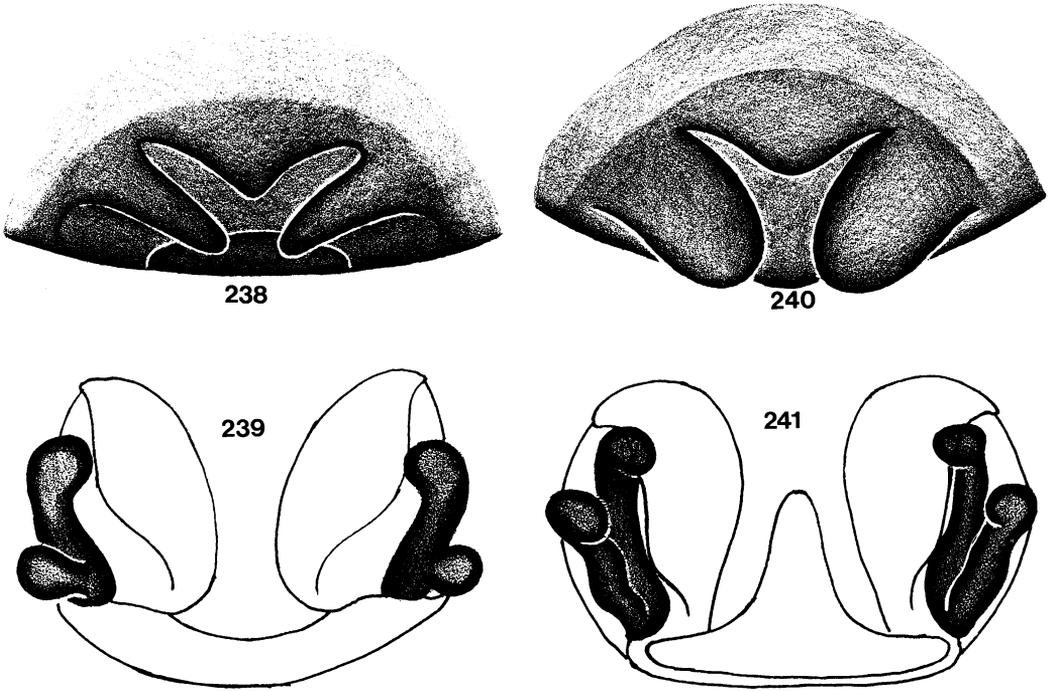
Figs. 235–237. *Runga nina*, new species, male. 235. Carapace, dorsal view. 236, 237. Bulb, ventral and distal views.

long, 1.39 wide. Abdomen 2.39 long, 1.23 wide, 1.23 high. Leg lengths: I 20.41, II 12.94, III 7.24, IV 10.47. Eye sizes and interdistances: AME 0.10, ALE 0.11, PME 0.11, PLE 0.11; AME-AME 0.07, AME-ALE 0.07, PME-PME 0.08, PME-PLE 0.11, ALE-PLE 0.02; MOQ length 0.37, front width 0.27, back width 0.30. Clypeal height 1.5 times AME diameter. Eyemound small, with numerous hairs. Chelicerae 0.85 long, vertical. Carapace (fig. 235) heavily shaded with black around eyes and extending back as broad band to thoracic groove, narrowing in extension to posterior margin (as in fig. 242), lateral margins shaded; abdomen with distinct dorsal folium broken up by pale patches, venter with dark band extending back from epigastric furrow to midway toward spinnerets. Palp 1.77 long; tibia with retrodorsal projection bearing long subdistal macroseta (fig. 234); paracymbium with distinct spine on upper margin (figs. 232, 233); apophyses with strong distal spur bent near midpoint, surface denticulate (figs. 236, 237).

FEMALE: Total length 4.21. Carapace 1.85 long, 1.31 wide. Abdomen 2.39 long, 1.93 wide, 1.93 high. Leg lengths: I 17.71, II 11.09, III 6.08, IV 9.09. Eyes and other features as in male except abdominal ventral band extends back to spinnerets. Epigynum with

pronglike lateral projections (fig. 238); secondary pair of receptacula short (fig. 239).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Fiordland:* Deep Cove, Jan. 22, 1958, at night (R. R. Forster, OMD), 1♂, 1♀; The Divide, Eglinton Valley, Mar. 27, 1987 (N. I. Platnick, R. R. Forster, AMNH), 1♀; Gunn's Camp, Hollyford Valley, Feb. 6, 1986 (R. R. Forster, OMD), 2♂, 1♀; Lake Marian Track, Hollyford Valley, Mar. 27, 1987, tree trunk, beech forest (R. R. Forster, OMD), 1♂; Lake Matheson, Jan. 30, 1969 (C. L. Wilton, OMD), 2♂. *Westland:* Arthurs Pass, Apr. 9, 1960 (R. Jenkins, OMD), 2♀; 8 km S Arthurs Pass, Mar. 19–21, 1980, elev. 670 m, pyrethrin fogging, sooty mold, lichens, and moss, beech bark (A. Newton, M. Thayer, AMNH), 1♂, 1♀; Franz Josef, Apr. 29, 1951 (R. R. Forster, OMD), 3♀, Feb. 19, 1984, litter, mixed rainforest (R. R. Forster, OMD), 2♀; Haast Motor Camp, Jan. 19, 1971, forest margin (R. R. Forster, OMD), 2♂, 1♀; Haast Pass, Mar. 15, 1966, at night (R. R. Forster, OMD), 1♂, Dec. 13, 1977, moss on tree trunks, subalpine beech forest (R. R. Forster, OMD), 1♀, Feb. 15, 1984 (R. R. Forster, OMD), 1♀; Lake Mahinapua Scenic Reserve, Mar. 16–22, 1980, elev. 30 m, window trap, mixed broadleaf-podocarp forest (A. Newton, M. Thayer, AMNH), 1♀; Lake Paringa, Dec. 9,



Figs. 238–241. 238, 239. *Runga nina*, new species. 240, 241. *R. raroa*, new species. 238, 240. Epigynum, ventral views. 239, 241. Epigynum, dorsal views.

1960 (J. I. Townsend, EDA), 1♀, Feb. 15, 1984, moss on tree trunks (R. R. Forster, OMD), 2♂; Makarora Valley, Dec. 12, 1977, moss on tree trunks (R. R. Forster, OMD), 1♂; Mount Hercules, near Harihari, Feb. 20, 1984, beating, mixed rainforest (R. R. Forster, OMD), 1♂, 1♀; Otira River, 6.8 km NE Otira, Mar. 18–21, 1980, elev. 280 m, pyrethrin fogging, podocarp bark (A. Newton, M. Thayer, AMNH), 1♀; Upper Bealey Track, Arthurs Pass, Feb. 22, 1984, moss on tree trunks, beech forest (R. R. Forster, OMD), 1♂, 2♀; Waiho, Dec. 1960 (P. R. Kettle, J. I. Townsend, EDA), 1♀.

DISTRIBUTION: Known only from northern Fiordland and southern Westland, South Island, New Zealand.

Runga raroa Forster,
new species

Figures 240, 241, 243

TYPES: Female holotype from Golden Bay, Stewart Island, New Zealand (Nov. 15, 1961;

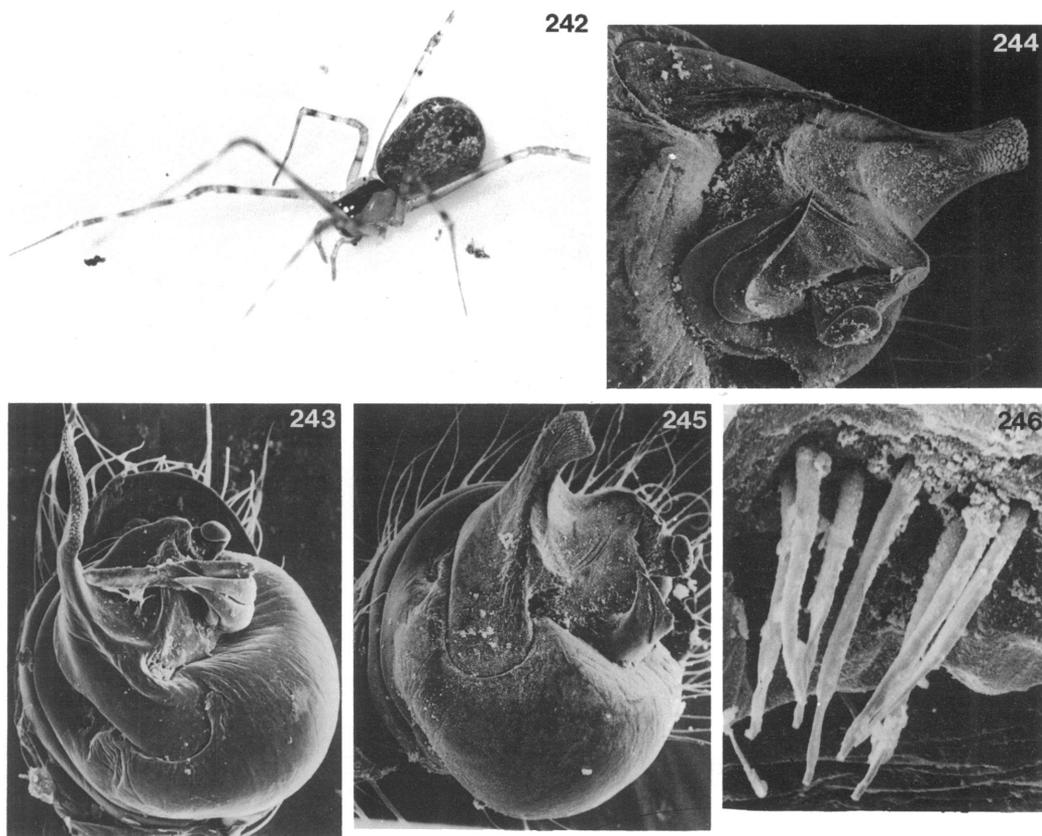
R. R. Forster), and male allotype from Port William, Stewart Island, New Zealand (Nov. 8, 1956; I. Mannering), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from Raroa Reserve.

DIAGNOSIS: This species seems closely related to *R. nina* but can be separated by the more elongate female receptacula (fig. 241) and the slender denticulate process on the male palpal bulb (fig. 243).

MALE: Total length 3.86. Carapace 1.85 long, 1.31 wide. Abdomen 2.00 long, 1.39 wide, 1.46 high. Leg lengths: I missing, II 19.93, III 5.70, IV 11.17. Eyes smaller than in female but relative sizes and interdistances similar. Clypeal height three times AME diameter. Eyemound small, with numerous hairs. Carapace yellow-brown with darker median band. Palp 1.84 long; bulb with long, narrow denticulate process (fig. 243).

FEMALE: Total length 3.61. Carapace 1.39 long, 1.16 wide. Abdomen 2.24 long, 1.46 wide, 1.39 high. Leg lengths: I 18.71, II 11.94, III 6.70, IV 10.47. Eye sizes and interdis-



Figs. 242–246. 242. *Runga* sp., female, oblique lateral view, showing coloration pattern typical of genus. 243. *R. raroa*, new species, male palp, ventral view. 244–246. *R. moana*, new species, male. 244, 245. Bulb, lateral and ventral views. 246. Epiandrous gland spigots, ventral view.

tances: AME 0.07, ALE 0.10, PME 0.11, PLE 0.10; AME-AME 0.07, AME-ALE 0.07, PME-PME 0.06, PME-PLE 0.08, ALE-PLE 0.02; MOQ length 0.31, front width 0.21, back width 0.27. Clypeal height 2.5 times AME diameter. Carapace yellow-brown, without markings (possibly bleached); abdomen with distinct dorsal folium and faint shading on venter. Epigynum with lobelike lateral projections (fig. 240); secondary pair of receptacula elongate (fig. 241).

OTHER MATERIAL EXAMINED: NEW ZEALAND: Stewart Island: Raroa Reserve, Oct. 30, 1948 (R. K. Dell, NMW), 2♀.

DISTRIBUTION: Known only from Stewart Island.

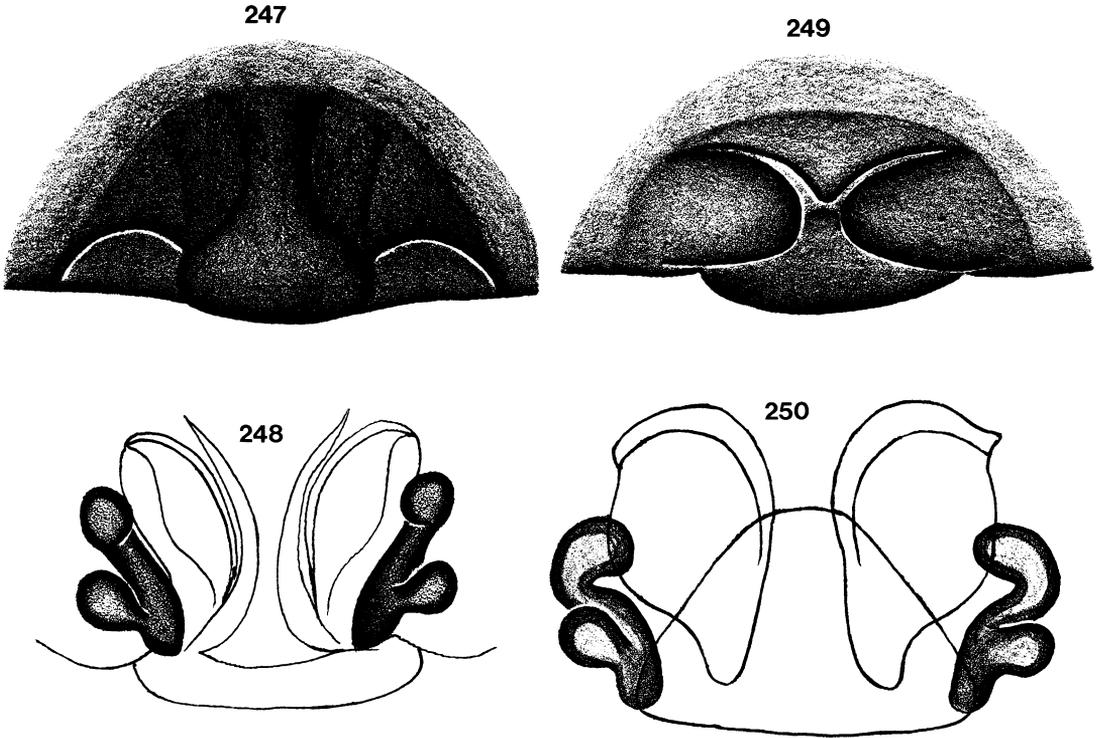
Runga moana Forster,
new species
Figures 244–248

TYPES: Male holotype and female allotype from Lake Moana, Westland, South Island, New Zealand (Mar. 10, 1950; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be recognized by the truncated denticulate palpal process (figs. 244, 245), females by the large epigynal septum (fig. 247).

MALE: Total length 3.11. Carapace 1.16 long, 1.00 wide. Abdomen 1.93 long, 1.16



Figs. 247–250. 247, 248. *Runga moana*, new species. 249, 250. *R. flora*, new species. 247, 249. Epigynum, ventral views. 248, 250. Epigynum, dorsal views.

wide, 1.00 high. Leg lengths: I 18.10, II 10.55, III 5.01, IV 9.01. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.07, PLE 0.06; AME-AME 0.04, AME-ALE 0.06, PME-PME 0.07, PME-PLE 0.06, ALE-PLE 0.02; MOQ length 0.21, front width 0.12, back width 0.21. Clypeal height three times AME diameter. Eyemound small, with numerous hairs. Carapace with median dark band; abdomen with few black patches dorsally, otherwise pale. Palp 1.00 long; distal process of bulb relatively short, stout, rugose distally (figs. 244, 245).

FEMALE: Total length 4.32. Carapace 1.69 long, 0.49 wide. Abdomen 2.70 long, 1.23 wide, 2.93 high. Leg lengths: I 18.17, II 11.55, III 6.16, IV 9.55. Eyes smaller than in male but relative sizes and interdistances similar. Other features as in male. Epigynum with distinct median septum (fig. 247); secondary receptacula on short, narrow stalks (fig. 248).

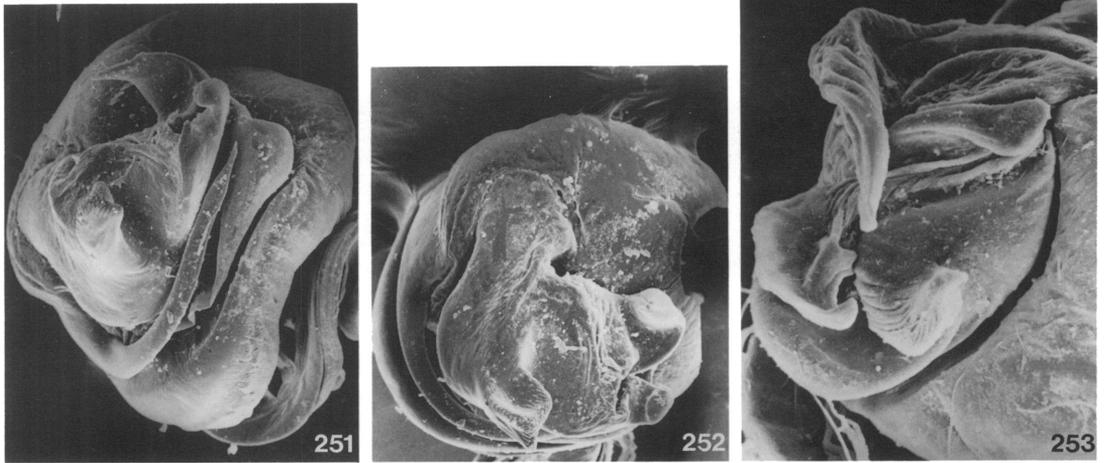
OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Westland:* Marsden Road, Greymouth, Mar. 5, 1949 (L. P. Highson, OMD), 1♂, 2♀; 5 mi W Otira, Sept. 29, 1966 (R. R. Forster, C. L. Wilton, OMD), 1♀.

DISTRIBUTION: Known only from Westland, South Island, New Zealand.

Runga flora Forster,
new species
Figures 249–252

TYPES: Male holotype beaten from foliage at Flora Hut, Mount Arthur Tableland, Nelson, South Island, New Zealand (Jan. 28, 1948; R. K. Dell), and female allotype from Salisbury Opening, Mount Arthur Tableland, Nelson, South Island, New Zealand (Jan. 22, 1948; R. R. Forster), deposited in NMW.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.



Figs. 251–253. 251, 252. *Runga flora*, new species, male palpal bulb, lateral and ventral views. 253. *R. akaroa*, new species, male palpal bulb, distal view.

DIAGNOSIS: This species can be distinguished from its congeners by the relatively short denticulate palpal process (figs. 251, 252) of males and the transversely oriented epigynal projections (fig. 249) of females.

MALE: Total length 3.44. Carapace 1.62 long, 1.08 wide. Abdomen 1.85 long, 1.08 wide, 1.08 high. Leg lengths: I 15.94, II 10.24, III 6.16, IV 8.86. Eye sizes and interdistances: AME 0.06, ALE 0.08, PME 0.07, PLE 0.08; AME-AME 0.06, AME-ALE 0.08, PME-PME 0.07, PME-PLE 0.10, ALE-PLE 0.02; MOQ length 0.24, front width 0.18, back width 0.21. Clypeal height slightly more than twice AME diameter. Eyemound small, with numerous hairs. Coloration bleached. Palp 1.62 long; distal spur short, stout, rugose distally (figs. 251, 252).

FEMALE: Total length 3.32. Carapace 1.46 long, 1.23 wide. Abdomen 1.93 long, 1.39 wide, 1.31 high. Leg lengths: I 14.17, II 8.78, III 5.70, IV 7.70. Eyes smaller but relative sizes and interdistances as in male. Other features as in male. Epigynal projections oriented transversely (fig. 249); primary receptacula sinuous (fig. 250).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Nelson:* Balloon Hut, Jan. 26, 1948, beaten from beech foliage (J. T. Salmon, NMW), 1♂, 1♀; Flora Hut, Jan. 20, 1948, tree trunk, at night (R. R. Forster,

OMD), 1♂; Flora Track, Apr. 5, 1946, under log (R. R. Forster, NMW), 1♀; Mount Arthur Track to Flora Hut, Feb. 10, 1946 (E. S. Gourlay, OMD), 1♂; Salisbury Opening, Mount Arthur Tableland, Jan. 23, 1948 (R. R. Forster, OMD), 1♂.

DISTRIBUTION: Known only from the Mount Arthur Tableland region, Nelson, South Island, New Zealand.

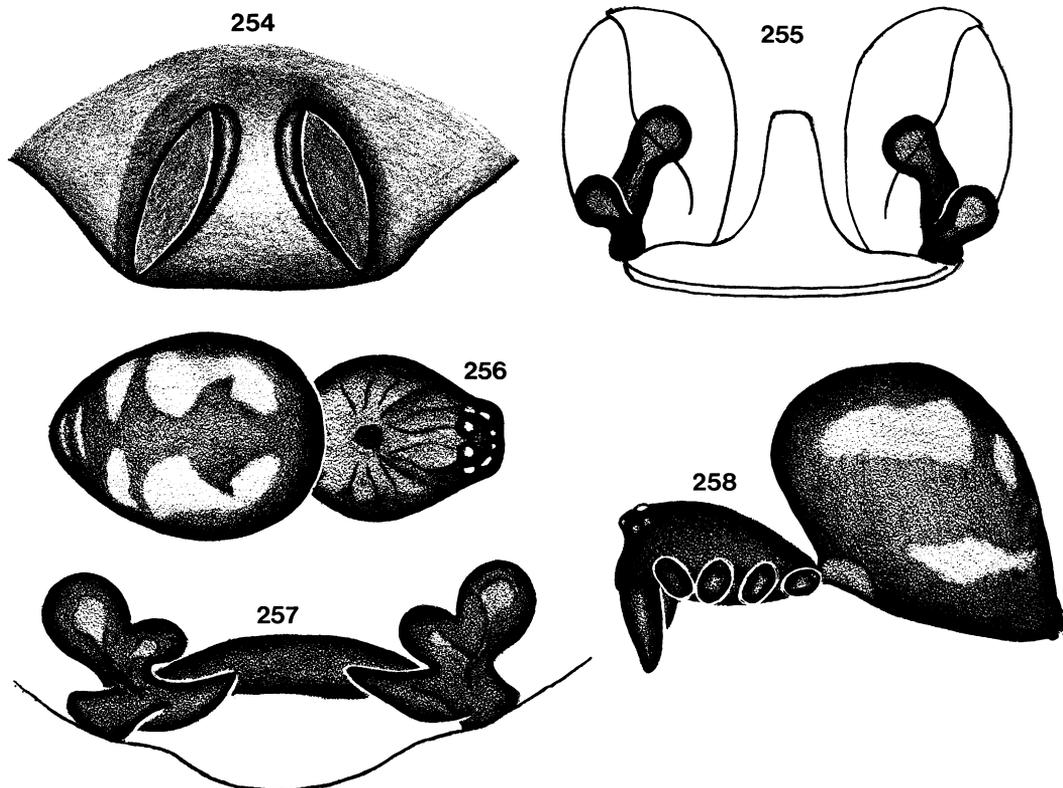
Runga akaroa Forster,
new species
Figures 253–255

TYPES: Male holotype from Okuti Valley, Banks Peninsula, Dec. 10, 1950; R. R. Forster, and female allotype from “The Cabstand,” Akaroa, Banks Peninsula, Canterbury, South Island, New Zealand (June 7, 1962; P. M. Johns), deposited in CMC.

ETYMOLOGY: The specific name is a noun in apposition taken from the allotype locality.

DIAGNOSIS: The presence of macrosetae on both the palpal patella and tibia and the reduction of the eyemound setation to four macrosetae separate males of this species from those of all other *Runga*; females (possibly misassociated) are characterized by the lateral epigynal pockets (fig. 254).

MALE: Total length 3.32. Carapace 1.31 long, 0.92 wide. Abdomen 2.00 long, 0.92



Figs. 254–258. 254, 255. *Runga akaroa*, new species, epigynum, ventral and dorsal views. 256–258. *Mangua gunni*, new species, female. 256. Body, dorsal view. 257. Epigynum, dorsal view. 258. Body, lateral view.

wide, 0.92 high. Leg lengths: I missing, II 10.01, III 5.16, IV 9.24. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.06, AME-ALE 0.04, PME-PME 0.08, PME-PLE 0.08, ALE-PLE 0.02; MOQ length 0.24, front width 0.18, back width 0.22. Clypeal height twice AME diameter. Eyemound a prominent projection with four apical bristles. Carapace uniformly yellow-brown; abdomen with numerous white patches speckled with black spots dorsally, pale elsewhere. Palp 0.85 long, with short stout macroseta on distal surface of patella and two macrosetae on basal retrolateral expansion of tibia; distal process of bulb striated (fig. 253).

FEMALE: Total length 3.20. Carapace 1.31 long, 0.92 wide. Abdomen 1.93 long, 1.46 wide, 1.16 high. Leg lengths: I 13.94, II 8.09,

III 4.93, IV 7.55. Eye sizes and interdistances: AME 0.07, ALE 0.10, PME 0.08, PLE 0.10; AME-AME 0.06, AME-ALE 0.07, PME-PME 0.11, PME-PLE 0.10, ALE-PLE 0.01; MOQ length 0.29, front width 0.20, back width 0.27. Clypeal height three times AME diameter. Carapace yellow-brown; abdomen with dark shading on dorsal and lateral surfaces but with pale middorsal band. Epigynum with lateral pockets (fig. 254); receptacula relatively short (fig. 255).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Canterbury:* Glentui Gorge, Mar. 14, 1954 (R. R. Forster, OMD), 1♀; Okuti Valley, Dec. 10, 1950 (R. R. Forster, OMD), 1♀.

DISTRIBUTION: Known only from central Canterbury and the Banks Peninsula, South Island, New Zealand.



Fig. 259. *Mangua gunni*, new species, female holding eggsac.

259

POSSIBLE RELATIVES

We consider here three genera that seem likely candidates for the closest relatives of physoglenines and pahorines. The new genus *Mangua* from New Zealand contains only one previously described species, from the subantarctic islands of New Zealand; it was described simply as a "*Linyphia*" by Forster (1964). The genus *Synotaxus*, widely distributed in the Neotropics, has been placed in the Theridiidae (Exline and Levi, 1965), but was first associated with pahorines by Simon (1894); its members construct a puzzling, highly structured web (Eberhard, 1977). Finally, the new genus *Chileotaxus* contains a single Chilean species apparently related to *Synotaxus*.

MANGUA FORSTER, NEW GENUS

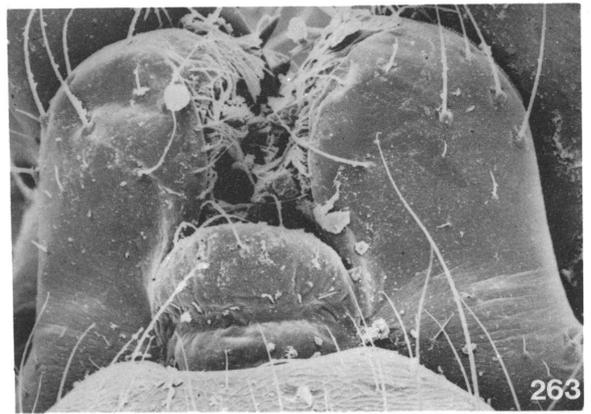
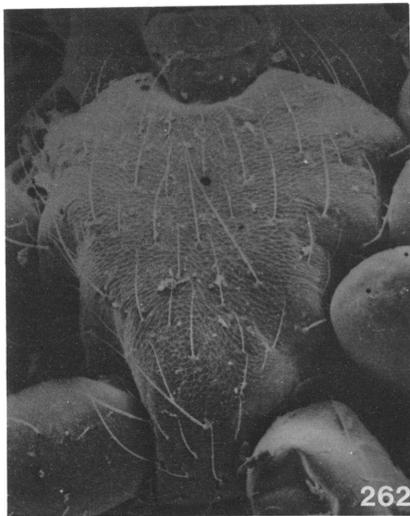
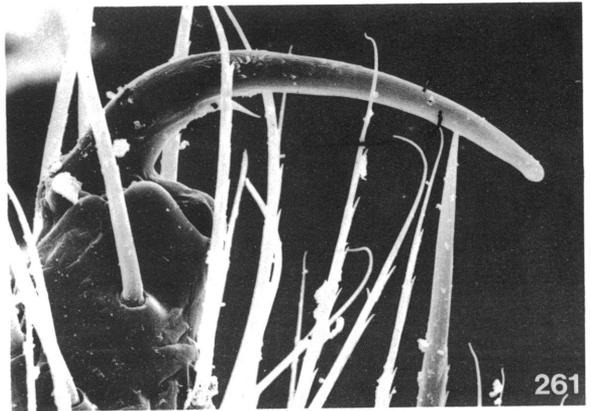
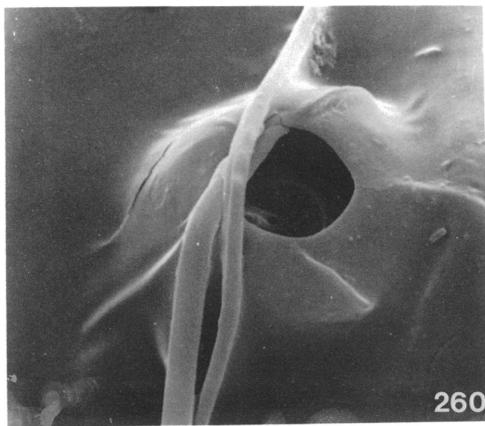
TYPE SPECIES: *Mangua gunni* Forster, new species.

ETYMOLOGY: The generic name is an arbitrary combination of letters considered feminine in gender.

DIAGNOSIS: The genus can be separated from physoglenines and pahorines by the

elongate male palp, the flattened paracymbium, the pyriform abdomen in both sexes, and the absence of an abdominal stridulatory structure in males.

DESCRIPTION: Small (total length 2.5–4.5) spiders with elongate legs and pyriform abdomens in both sexes. Carapace distinctly longer than wide; thoracic groove a shallow depression. Eyes in compact group, AME always smallest, remaining eyes subequal. Clypeus high, 4–7 times AME diameter. Chelicerae sometimes enlarged in male (figs. 273, 284), usually with five strong promarginal teeth and row of denticles along furrow (figs. 265, 274, 285, 286). Sternum uniformly dark, as long as wide, broadly obtuse to truncate posteriorly, separating coxae IV by 1.5 times their diameter, not tuberculate (fig. 262). Labium twice as wide as long, strongly rebordered (fig. 263). Endites twice as long as wide, inclined across labium, not meeting distally. Leg formula 1423, with first pair much longer than other legs; trichobothrial bases with lateral ridges (figs. 260, 276, 299); tarsal claws long, superiors with numerous small teeth, inferior with single tooth (fig. 266). Abdomen



Figs. 260–263. *Mangua gunni*, new species, female. 260. Trichobothrial base, dorsal view. 261. Palpal claw, lateral view. 262. Sternum, ventral view. 263. Labium and endites, ventral view.

patterned with black pigment; males with epiandrous spigots (fig. 275); colulus relatively long (fig. 264). Male palpal segments long, palp much longer than carapace (fig. 277); paracymbium a small flattened plate bent back distally; patella with strong disto-dorsal bristle; tibia with macrosetae; embolus short, spiniform, subdistal, associated with apophyses. Female palp long (fig. 272) with relatively long, strong tarsal claw bearing single ventral tooth (fig. 261). Epigynum weakly protuberant (fig. 267). Internal female genitalia relatively small, varied in form but based on four receptacula.

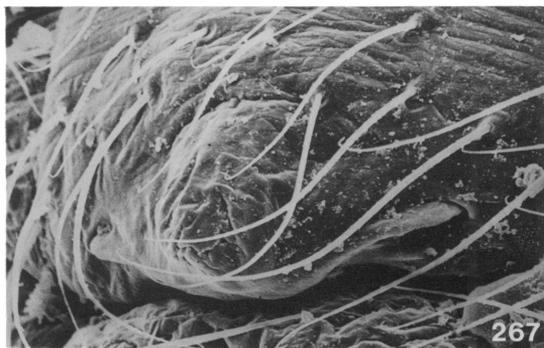
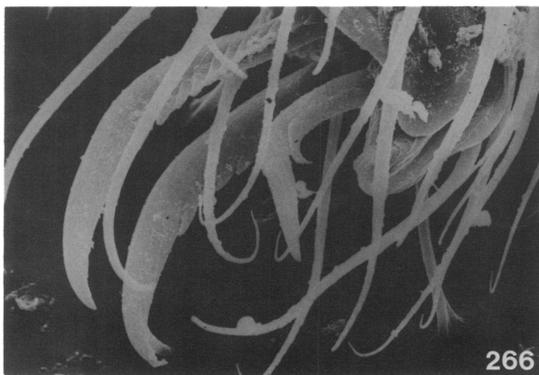
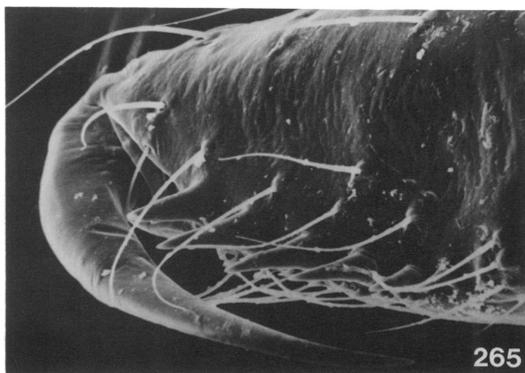
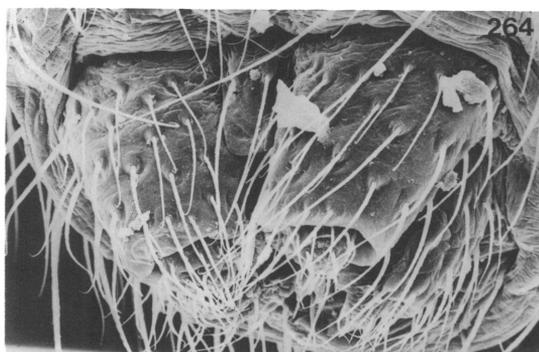
DISTRIBUTION: Found in both the North and South Islands as well as Stewart Island

and the Auckland and Campbell Islands of New Zealand.

NATURAL HISTORY: These spiders construct a small irregular snare under logs in forest or among grasses and moss on the forest floor. Females of a number of species have been observed carrying an eggsac suspended beneath the palpi (fig. 259).

Mangua gunni Forster,
new species
Figures 256–271

TYPES: Male holotype and female allotype taken from moss on trunks of *Nothofagus* at The Divide, Eglinton Valley, Fiordland,



Figs. 264–267. *Mangua gunni*, new species, female. 264. Spinnerets and colulus, ventral view. 265. Chelicera, oblique medial view. 266. Claws of tarsus I, lateral view. 267. Epigynum, ventral view.

South Island, New Zealand (Mar. 26, 1987; R. R. Forster, N. I. Platnick), deposited in OMD.

ETYMOLOGY: The specific name is a patronym in honor of Murray Gunn, a longtime resident of the region and companion in exploration.

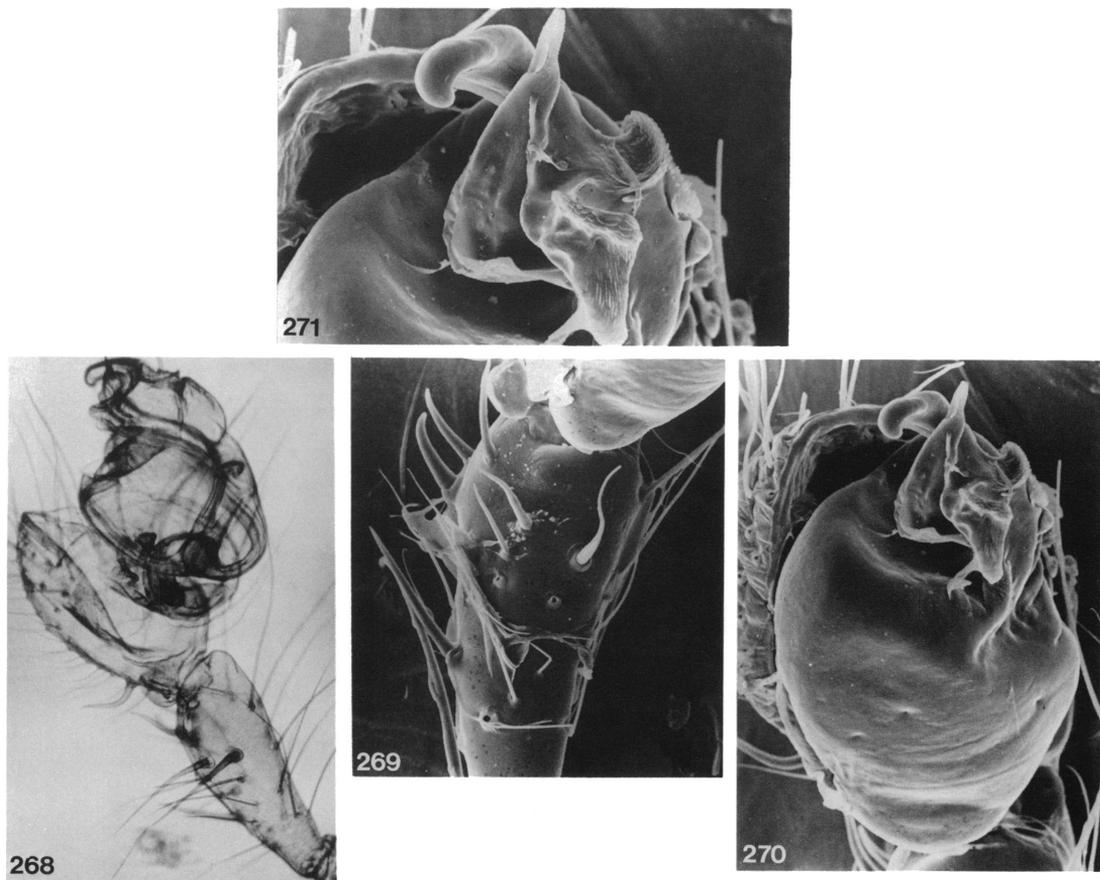
DIAGNOSIS: Males can be recognized by the sinuous retrolateral macroseta on the palpal tibia (fig. 269); females resemble those of *M. makaroa* but have a less produced epigynal lobe (fig. 257).

MALE: Total length 3.39. Carapace 1.31 long, 1.08 wide. Abdomen 2.16 long, 1.16 wide, 1.31 high. Leg lengths: I 10.55, II 7.39, III 5.16, IV 7.78. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.01, AME-ALE 0.03, PME-PME 0.07, PME-PLE 0.07, ALE-PLE 0.01; MOQ length 0.17, front width 0.09, back width 0.21. Clypeal height over four times AME diameter. Chelicerae 1.08 long,

vertical, divergent, with six evenly spaced promarginal teeth; fang strong, sinuous. Carapace dark with weak pattern; abdomen pyriform, patterned as in figures 256, 258. Palp 1.09 long; patella twice length of tibia, with strong distodorsal bristle; tibia with strong macrosetae (figs. 268, 269); distal processes of bulb complex (figs. 270, 271).

FEMALE: Total length 3.45. Carapace 1.31 long, 1.16 wide. Abdomen 2.31 long, 1.46 wide, 1.42 high. Leg lengths: I 9.78, II 7.08, III 8.62, IV 7.24. Eyes as in male except PME more widely separated. Clypeal height three times AME diameter. Chelicerae shorter (0.62). Coloration as in male. Internal genitalia (fig. 257) with paired receptacula fused but lumen of each distinct.

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Fiordland:* Cascade Creek, Eglinton Valley, Feb. 16, 1966, moss (R. R. Forster, OMD), 1♀, Jan. 12, 1971 (R. R. Forster, OMD), 3♀, Oct. 6–Nov. 18, 1978,



Figs. 268–271. *Mangua gunni*, new species, right male palp. 268. Cleared palp, retrolateral view. 269. Tibia and paracymbium, retrolateral view. 270, 271. Bulb, ventral views.

pitfall (R. R. Forster, OMD), 2♂, 2♀; Eglinton Valley, The Divide, Mar. 27, 1987, moss on beech trunks (N. I. Platnick, R. R. Forster, AMNH), 1♂, 1♀; Gunn's Camp, Hollyford Valley, Feb. 1986, under logs (R. R. Forster, OMD), 6♀; Hollyford Valley Divide, Mar. 26, 1967, moss on beech trunks (R. R. Forster, N. I. Platnick, OMD, AMNH), 5♀; Lake Te Anau, Mar. 25, 1987, under log, beech forest on shore (N. I. Platnick, R. R. Forster, AMNH), 1♀; Marian Valley, Dec. 6, 1959, rotting wood (M. A. Chapman, OMD), 1♀; Notornis Valley, Te Anau, Jan. 11, 1949 (J. H. Sorensen, OMD), 1♀, Feb. 20, 1954 (P. C. Bull, OMD), 1♀; Spey River, Feb. 22, 1959, on myrtus (Otago University Biological Society, OMD), 1♀; Lake Te Au, near S arm of Lake Te Anau, Jan. 24, 1953, moss (R. R. Forster, OMD), 2♀.

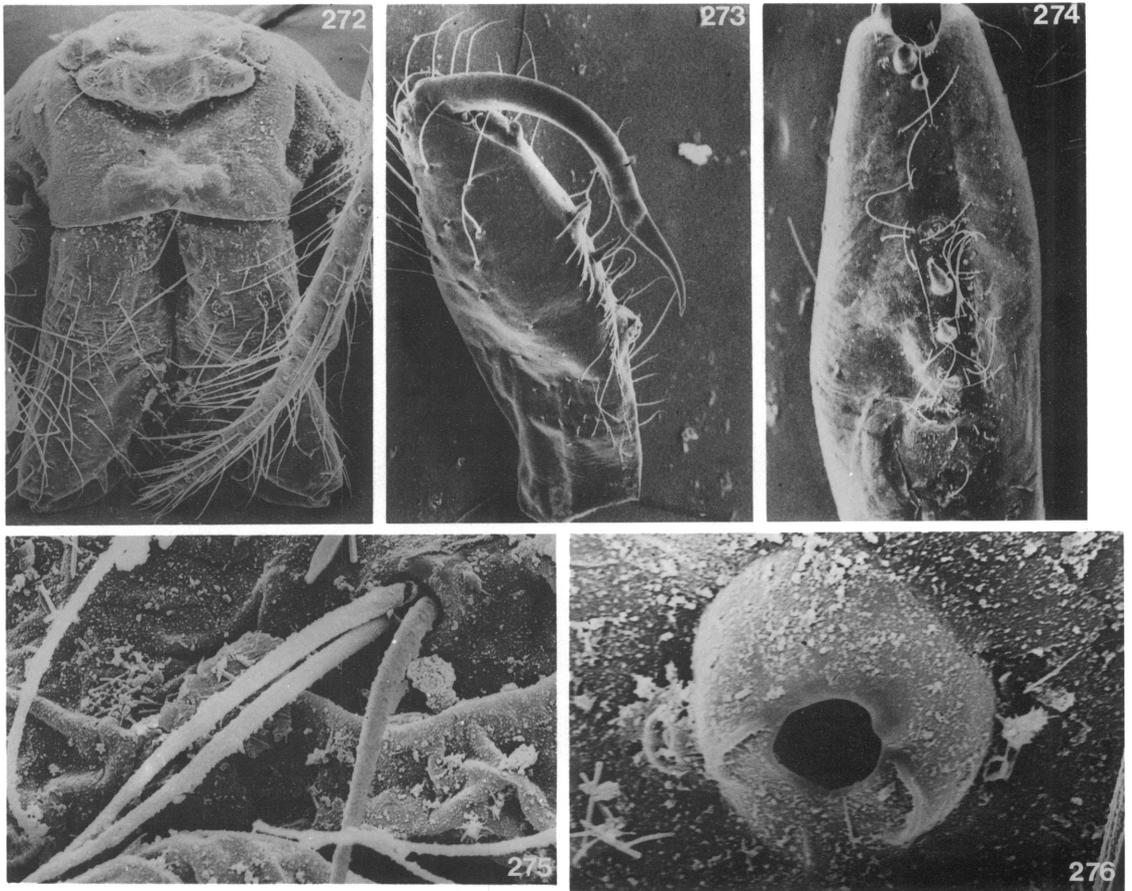
DISTRIBUTION: Known only from Fiordland, South Island, New Zealand.

Mangua caswell Forster,
new species
Figures 272–276, 287, 293

TYPES: Male holotype and female allotype taken from moss on *Nothofagus* tree trunks at Caswell Sound, Fiordland, South Island, New Zealand (Apr. 18, 1948; R. R. Forster), deposited in NMW.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species seem closely related to *M. gunni* but can be separated by the stronger chelicerae (figs. 273, 274) and differences in the palpal tibial spination (fig. 287)



Figs. 272–276. *Mangua caswell*, new species. 272. Female clypeus and chelicerae, anterior view. 273, 274. Male chelicera, posterior and medial views. 275. Epiandrous gland spigots, ventral view. 276. Trichobothrial base, dorsal view.

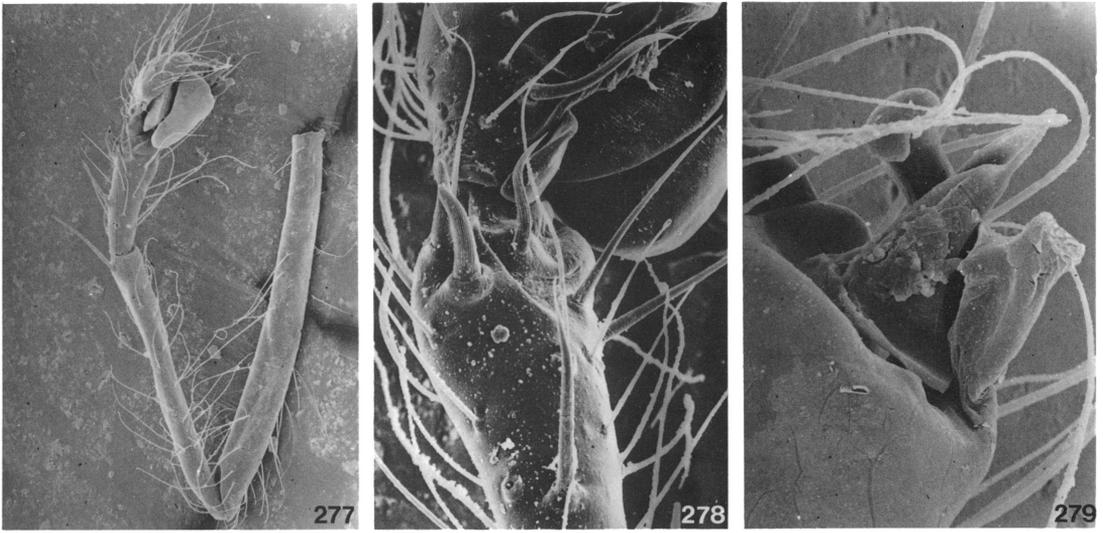
of males and the more widely separated female receptacula (fig. 293).

MALE: Total length 3.49. Carapace 1.54 long, 1.54 wide. Abdomen 2.16 long, 2.14 wide, 1.16 high. Leg lengths: I 13.68, II 9.90, III 6.30, IV 10.08. Eye sizes and interdistances: AME 0.04, ALE 0.08, PME 0.08, PLE 0.08; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.13, PME-PLE 0.02, ALE-PLE 0.01; MOQ length 0.19, front width 0.09, back width 0.29. Clypeal height six times AME diameter. Chelicerae 1.69 long, divergent, with long sinuous fang; six strong teeth (two distal, four proximal) on promargin. Coloration as in *M. gunni*. Palp 3.42 long; tibia with long middorsal bristles and three distal macrosetae (fig. 287).

FEMALE: Total length 3.61. Carapace 1.39

long, 1.08 wide. Abdomen 1.98 long, 1.44 wide, 1.42 high. Leg lengths: I 12.42, II 8.10; III 6.30; IV 8.82. Eye sizes and interdistances: AME 0.06, ALE 0.08, PME 0.08, PLE 0.08; AME-AME 0.01, AME-ALE 0.03, PME-PME 0.08, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.20, front width 0.13, back width 0.24. Clypeal height five times AME diameter. Chelicerae shorter (0.77), with even row of five promarginal teeth. Coloration as in *M. gunni*. Receptacula relatively widely separated (fig. 287).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Fiordland:* Rugged Burn Valley, W Te Anau, Feb. 15, 1953 (G. W. Ramsay, AMNH), 1♂, 1♀; Stillwater Base Camp, Mar. 13, 1949 (R. K. Dell, NMW), 1♂, 2♀; Upper Stillwater River, Caswell Sound,



Figs. 277–279. *Mangua makarora*, new species, right male palp. 277. Retrolateral view. 278. Tibia and paracymbium, retrolateral view. 279. Distal elements of bulb, retrolateral view.

Apr. 13, 1949, moss (R. R. Forster, OMD), 1♂, 2♀.

DISTRIBUTION: Known only from Fiordland, South Island, New Zealand.

Mangua makarora Forster,
new species
Figures 277–283

TYPES: Male holotype and female allotype taken from moss in *Nothofagus* forest at Makarora West, Westland, South Island, New Zealand (Feb. 15, 1984; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species seems closely related to *M. caswell* but can be separated by the smaller size and differences in the spination of the male palpal tibia (figs. 277, 278) and the medially produced epigynal lobe (fig. 280) of females.

MALE: Total length 2.16. Carapace 1.01 long, 0.82 wide. Abdomen 1.20 long, 0.76 wide, 0.74 high. Leg lengths: I 7.81, II 5.42, III 4.22, IV 5.48. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.01, AME-ALE 0.03, PME-PME 0.06, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.17, front width 0.07, back width 0.18. Clypeal height seven times AME diameter. Chelicerae not enlarged, 0.63

long, with five promarginal teeth spread along proximal half of furrow; fang long, sinuous; few small denticles along furrow. Coloration as in figure 281. Palp more than twice carapace length (2.27); tibia with middorsal bristle and three distal macrosetae, ventral macroseta sinuous (figs. 277, 278); distal apophyses of bulb relatively short (fig. 279).

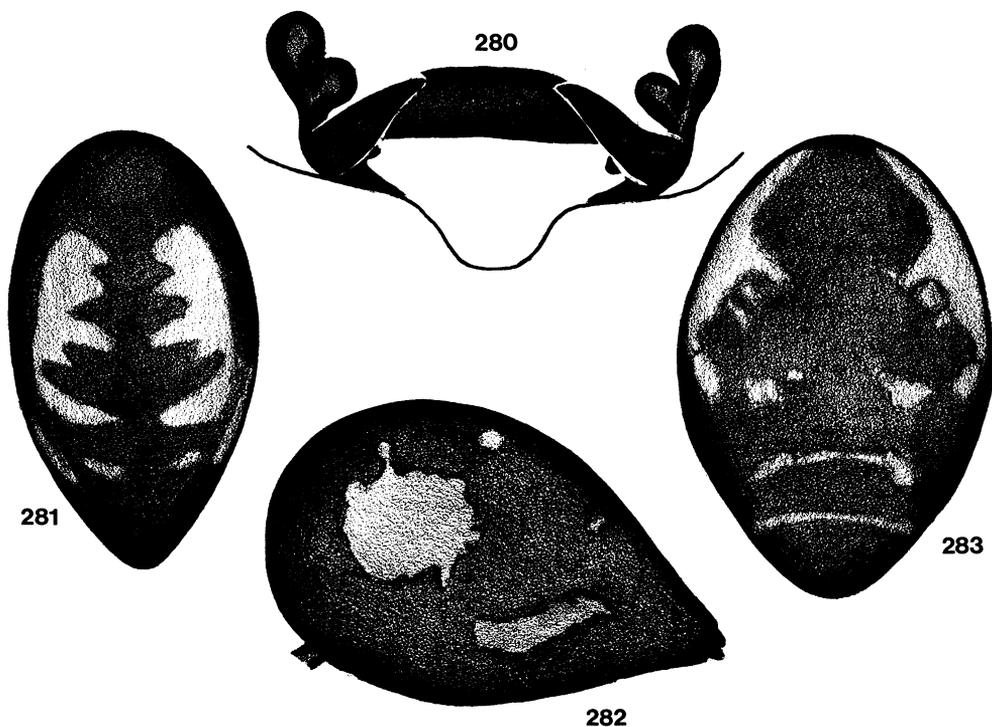
FEMALE: Total length 2.30. Carapace 0.95 long, 0.82 wide. Abdomen 1.46 long, 0.92 wide, 0.94 high. Leg lengths: I 6.55, II 4.98, III 3.78, IV 5.48. Eye sizes and interdistances as in male, MOQ length slightly less. Clypeal height eight times AME diameter. Coloration as in male (figs. 282, 283). Epigynum produced posteriorly at middle (fig. 280), with lumens of paired receptacula distinct.

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Westland:* Makarora Valley, Aug. 28, 1972, moss on forest floor (R. R. Forster, OMD), 2♂, 1♀, Feb. 12, 1977 (R. R. Forster, OMD), 6♀.

DISTRIBUTION: Known only from Westland, South Island, New Zealand.

Mangua sana Forster,
new species
Figures 284–286, 288–292, 294

TYPES: Male holotype and female allotype taken in pitfall trap in *Freycinetia banksii* at Taumaka, Open Bay Island, Westland, South



Figs. 280–283. *Mangua makarora*, new species. 280. Epigynum, dorsal view. 281. Male abdomen, dorsal view. 282, 283. Female abdomen, lateral and dorsal views.

Island, New Zealand (Jan. 6, 1971; M. E. Miller), deposited in OMD.

ETYMOLOGY: The specific name is an arbitrary combination of letters.

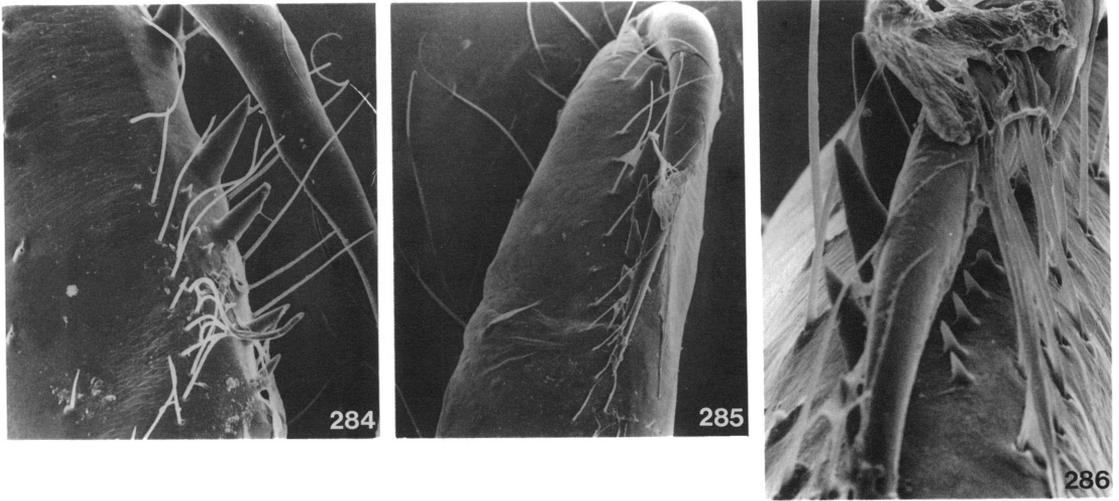
DIAGNOSIS: This species seems closely related to *M. gunni* but can be separated by the grouping of the tibial macrosetae on the male palp (fig. 283) and the large medial epigynal ducts (fig. 294) of females.

MALE: Total length 2.56. Carapace 1.16 long, 0.92 wide. Abdomen 1.54 long, 0.92 wide, 1.08 high. Leg lengths: I missing, II 6.70, III 4.85, IV 7.01. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.07, PME-PLE 0.01, ALE-PLE 0.01; MOQ length 0.17, front width 0.09, back width 0.21. Clypeal height six times AME diameter. Chelicerae 1.00 long, strong, divergent, with five promarginal teeth, most distal separated from other four; four small denticles along furrow; fang slightly sinuous

(fig. 284). Coloration as in *M. gunni*. Palp 2.77 long; tibia with two closely spaced, short macrosetae on distodorsal surface (figs. 288, 289); distal process of bulb hooked (figs. 290–292).

FEMALE: Total length 2.70. Carapace 1.18 long, 0.90 wide, 0.54 high. Abdomen 1.72 long, 1.26 wide, 1.26 high. Leg lengths: I femur 2.16 (remaining segments missing), II 5.94, III 4.68, IV 6.30. Eye sizes and interdistances: AME 0.03, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.02, AME-ALE 0.02, PME-PME 0.10, PME-PLE 0.02, ALE-PLE 0.02; MOQ length 0.19, front width 0.08, back width 0.24. Clypeal height five times AME diameter. Chelicerae 0.62 long, with five evenly spaced promarginal teeth (figs. 285, 286). Coloration as in male. Median epigynal ducts large (fig. 294).

OTHER MATERIAL EXAMINED: Three females taken at the type locality on Jan. 4, 1971 (M. E. Miller, OMD).



Figs. 284–286. *Mangua sana*, new species. 284, 285. Male chelicera, posterior and medial views. 286. Female chelicera, medial view.

DISTRIBUTION: Known only from Open Bay Island, Westland, South Island, New Zealand.

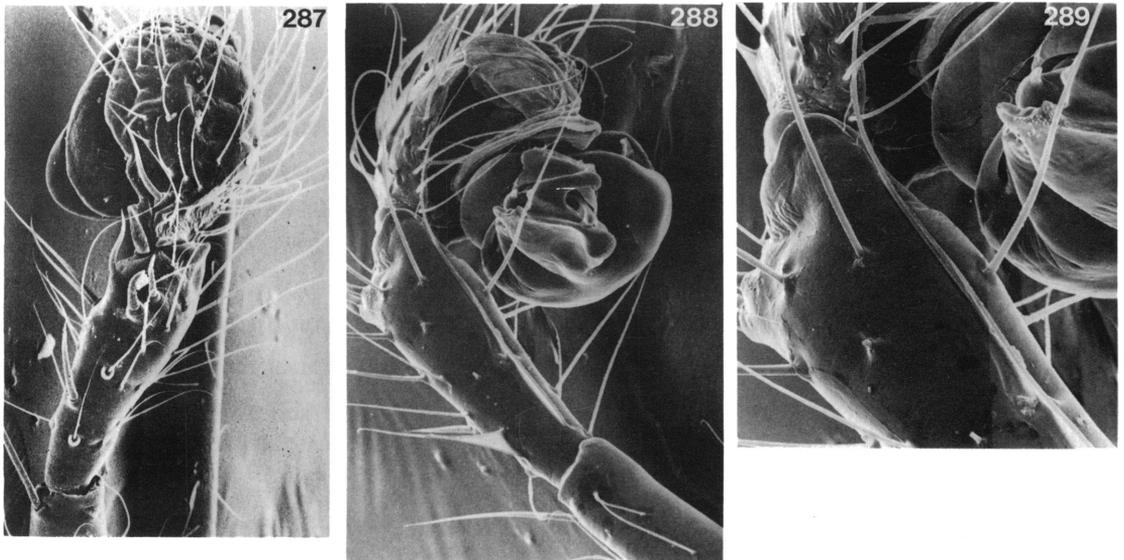
Mangua otira Forster,
new species
Figures 295–298

TYPES: Female holotype taken from leaf litter 5 mi west of Otira, Westland, South

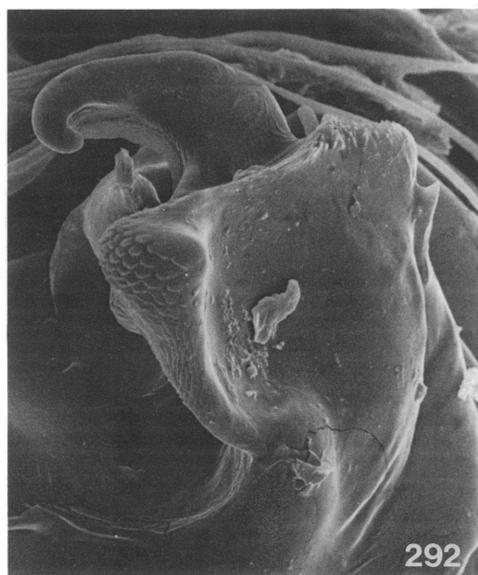
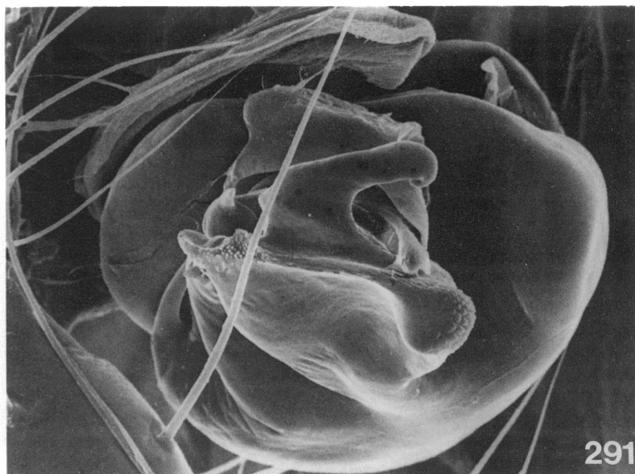
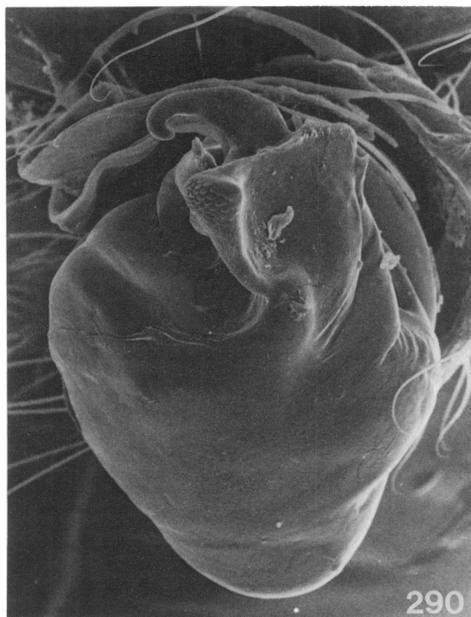
Island, New Zealand (Sept. 29, 1966; R. R. Forster, C. L. Wilton), and male allotype taken from leaf litter at Otira, Westland, South Island, New Zealand (June 26, 1950; R. J. Jacobs), deposited in OMD.

ETYMOLOGY: The specific name is noun in apposition taken from the type locality.

DIAGNOSIS: This species is characterized by the distinct abdominal pattern (figs. 295, 296), the elongate epigynal ducts (fig. 297), and the



Figs. 287–289. 287. *Mangua caswell*, new species, left male palp, retrolateral view. 288, 289. *M. sana*, new species, left male palp, prolatral views.



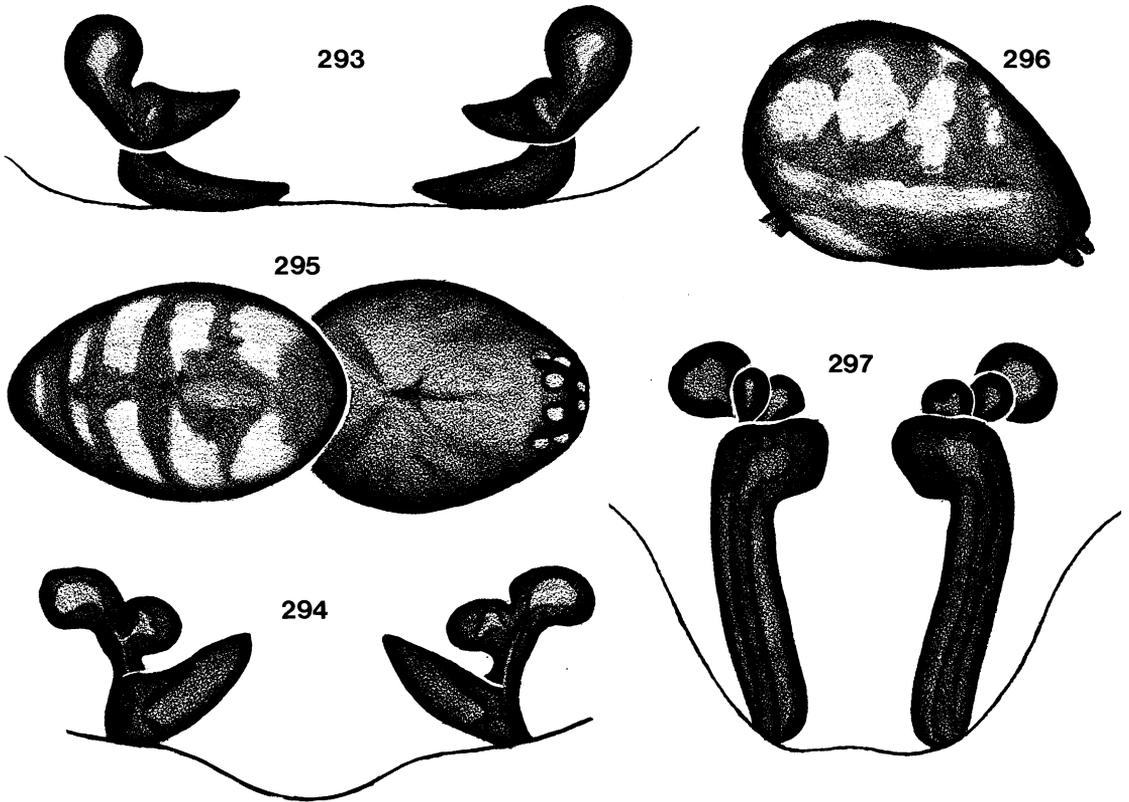
Figs. 290-292. *Mangua sana*, new species, male palpal bulb, ventral and prolateral view, and enlargement of distal apophyses, ventral view.

unusual segmental lengths of the male palp, where the patella is twice the length of the tibia.

MALE: Total length 1.58. Carapace 0.76 long, 0.76 wide. Abdomen 1.98 long, 1.26 wide, 1.26 high. Leg lengths: I 5.22, II 3.78, III 2.88, IV 3.96. Eye sizes and interdistances as in female. Clypeal height almost seven times AME diameter. Chelicerae and coloration as in female. Palp 1.26 long; patella twice as long as tibia; tibia with two short,

stout macrosetae on distodorsal surface (fig. 298).

FEMALE: Total length 1.59. Carapace 0.76 long, 0.76 wide. Abdomen 0.88 long, 0.82 wide, 0.79 high. Leg lengths: I 5.42, II 3.84, III 3.09, IV 4.41. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.07, PLE 0.06; AME-AME 0.01, AME-ALE 0.03, PME-PME 0.06, PME-PLE 0.01, ALE-PLE 0.01; MOQ length 0.13, front width 0.09, back width 0.20. Clypeal height four times



Figs. 293–297. 293. *Mangua caswell*, new species. 294. *M. sana*, new species. 295–297. *M. otira*, new species. 293, 294, 297. Epigynum, dorsal views. 295, 296. Female, dorsal view and lateral view of abdomen.

AME diameter. Chelicerae short (0.50), with five evenly spaced promarginal teeth. Abdomen patterned as in figures 295, 296; ventral surface dark. Epigynal ducts elongate (fig. 297).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Westland, South Island, New Zealand.

***Mangua secunda* Forster,**
new species
Figure 307

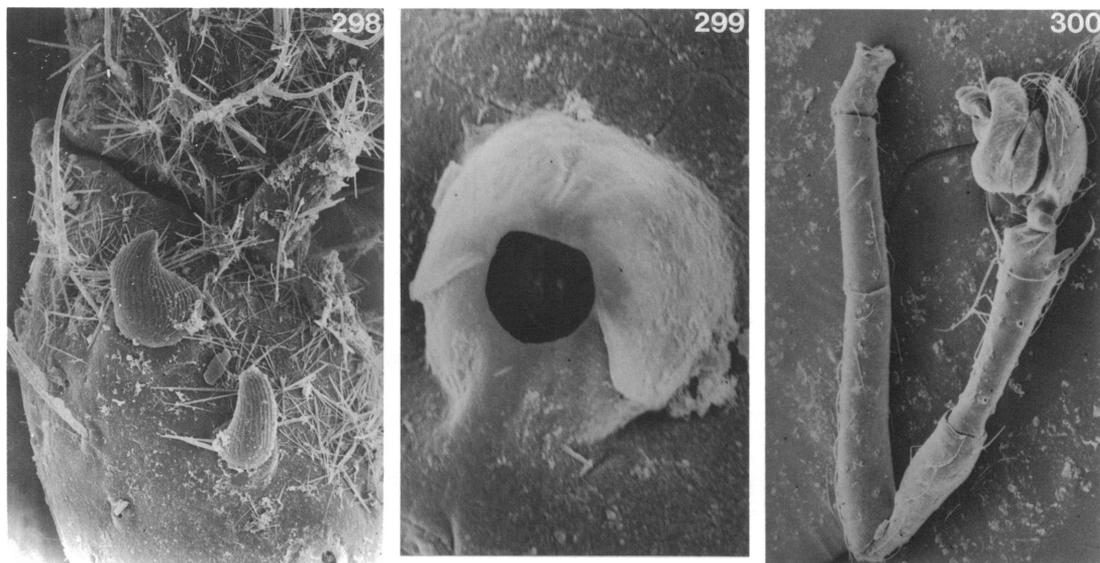
TYPE: Female holotype taken from foliage at Vinegar Hill Reserve, Manawatu, North Island, New Zealand (Dec. 13, 1948; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to this being the second species from Vinegar Hill.

DIAGNOSIS: This species seems closely related to the *M. gunni* group of species from the South Island but can be separated from all the southern species by the spherical distal receptacula (fig. 307).

MALE: Unknown.

FEMALE: Total length 3.49. Carapace 1.16 long, 1.08 wide. Abdomen 2.39 long, 1.31 wide, 1.62 high. Leg lengths: I 11.17, II 8.24, III 6.16, IV 8.24. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.08, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.05, front width 0.07, back width 0.20. Clypeal height seven times AME diameter. Chelicerae 0.77 long, vertical, with five promarginal teeth. Specimen faded but faint abdominal pattern appears similar to that of *M. gunni*. Receptacula spherical, on longitudinally oriented ducts (fig. 307).



Figs. 298–300. 298. *Mangua otira*, new species. 299, 300. *M. kapiti*, new species. 298. Right male palpal tibia and paracymbium, retrolateral view. 299. Trichobothrial base, dorsal view. 300. Left male palp, retrolateral view.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Manawatu, North Island, New Zealand.

Mangua kapiti Forster,
new species

Figures 299–303

TYPE: Male holotype from Kapiti Island, Wellington, North Island, New Zealand (May 1948; R. R. Forster), deposited in NMW.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be separated from those of all other known species by the paired short and long distal macrosetae on the male palpal tibia (figs. 300, 301) and the elongate prong on the palpal bulb (figs. 302, 303).

MALE: Total length 3.02. Carapace 1.26 long, 1.01 wide. Abdomen 1.83 long, 1.01 wide, 0.98 high. Leg lengths: I 11.21, II 7.88, III 5.54, IV 8.13. Eye sizes and interdistances: AME 0.03, ALE 0.06, PME 0.06, PLE 0.06; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.08, PME-PLE 0.04, ALE-PLE 0.04; MOQ length 0.15, front width 0.07, back width 0.20. Clypeal height nine times AME diameter. Chelicerae 0.38 long, with five promarginal teeth. Coloration unknown

(specimen bleached). Palp 2.52 long; tibia with two distodorsal macrosetae, retromarginal one short, stout, promarginal one much longer, slender, curved distally (figs. 300, 301); bulb with long prong (figs. 302, 303).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: NEW ZEALAND: North Island: Wellington: Johnson's Hill, Mar. 23, 1946, under log (R. R. Forster, NMW), 1♂.

DISTRIBUTION: Known only from Wellington, North Island, New Zealand; it is possible that this species is the male of *M. secunda* but the separation of the lateral eyes suggests that it is distinct.

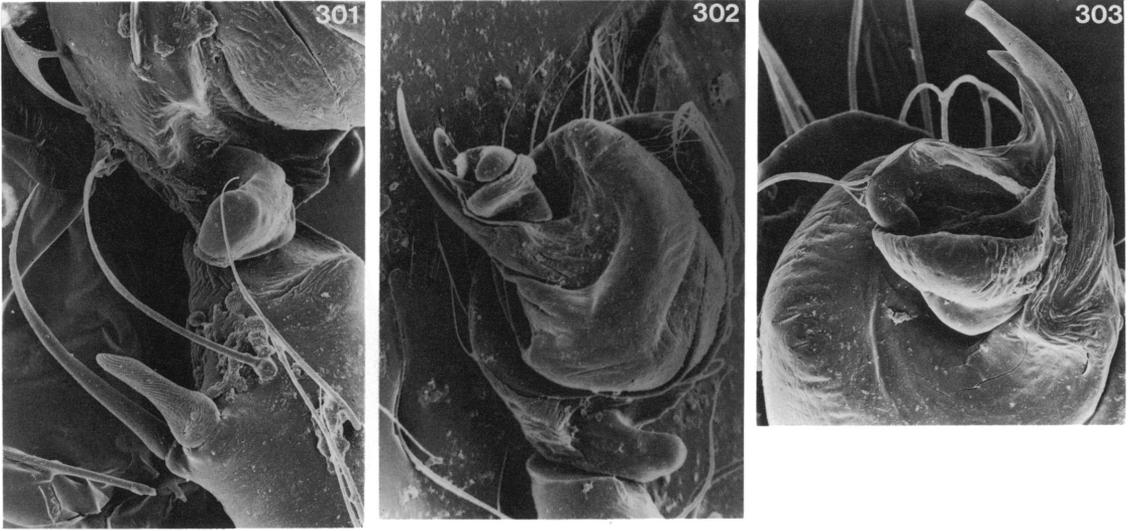
Mangua paringa Forster,
new species

Figures 304–306, 308, 309

TYPES: Male holotype and female allotype taken beneath logs in forest at Lake Paringa, Westland, South Island, New Zealand (Feb. 17, 1984; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species is characterized by the presence of three stout distodorsal macrosetae on the male palpal tibia (figs. 304,

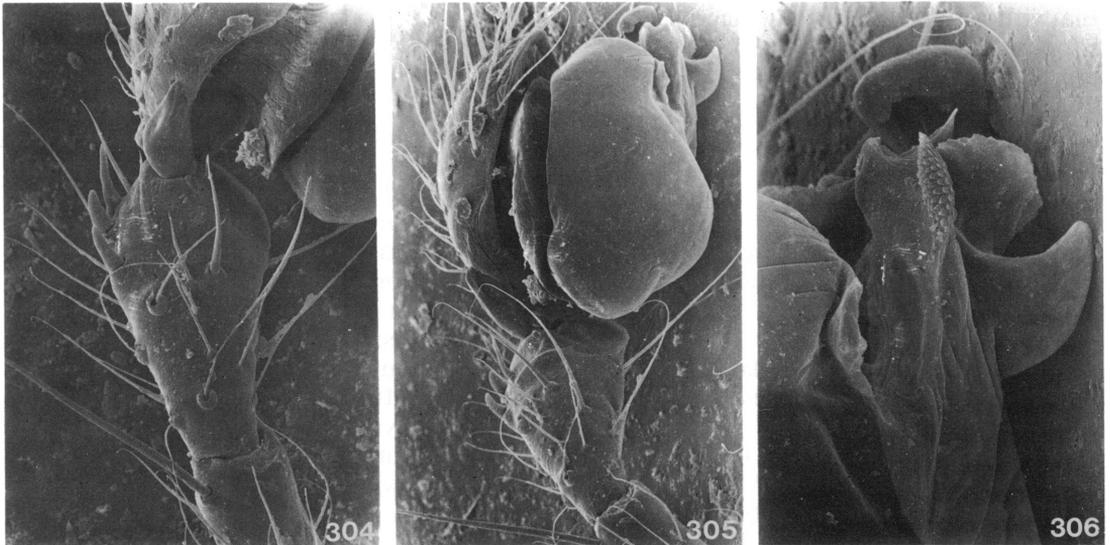


Figs. 301–303. *Mangua kapiti*, new species, male palp. 310. Tibia and paracymbium of right palp, retrolateral view. 311. Bulb of left palp, ventral view. 312. Bulb of right palp, retrolateral view.

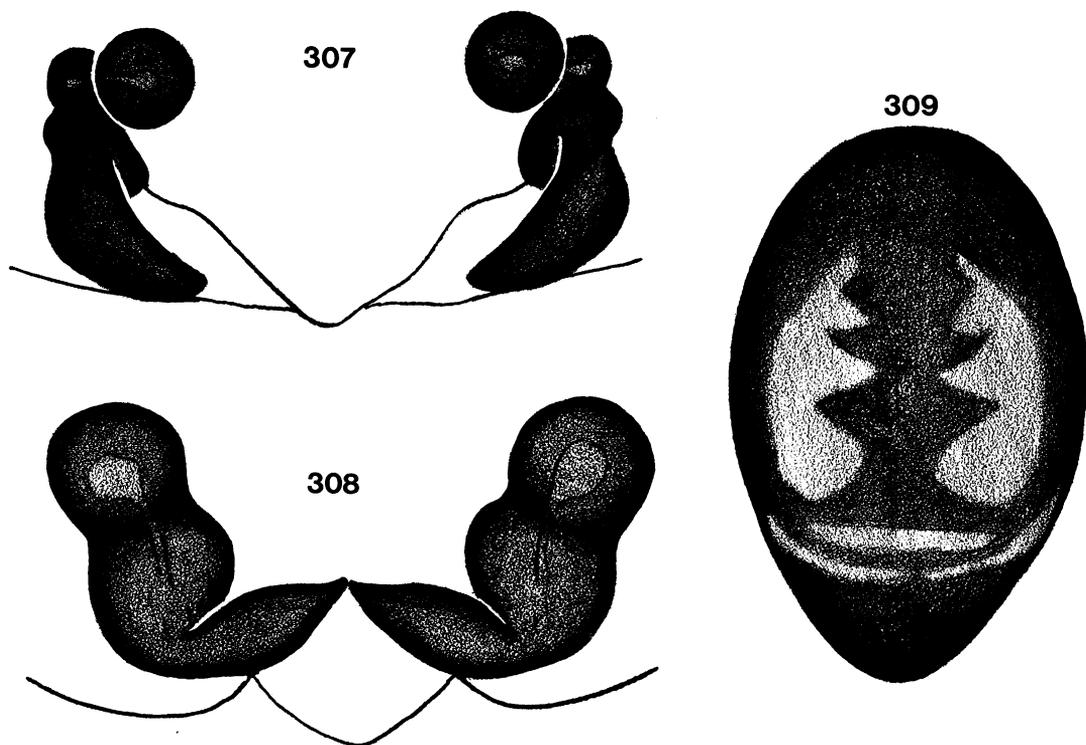
305) and the distinctively shaped female receptacula (fig. 308).

MALE: Total length 2.46. Carapace 1.13 long, 0.88 wide. Abdomen 1.39 long, 0.69 wide, 0.69 high. Leg lengths: I 8.38, II 5.73, III 4.28, IV 6.11. Eye sizes and interdistances: AME 0.04, ALE 0.03, PME 0.07, PLE

0.07; AME-AME 0.04, AME-ALE 0.03, PME-PME 0.07, PME-PLE 0.04, ALE-PLE 0.02; MOQ length 0.17, front width 0.12, back width 0.21. Clypeal height almost five times AME diameter. Chelicerae 0.63 long, with five evenly spaced promarginal teeth. Coloration as in figure 309. Palp 1.51 long;



Figs. 304–306. *Mangua paringa*, new species, right male palp, retrolateral views. 304. Tibia and paracymbium. 305. Bulb. 306. Distal elements of bulb.



Figs. 307–309. 307. *Mangua secunda*, new species. 308, 309. *M. paringa*, new species, female. 307, 308. Epigynum, dorsal views. 309. Abdomen, dorsal view.

tibia with row of three stout macrosetae on distodorsal surface (figs. 304, 305); bulb with hooked distoventral projection (figs. 305, 306).

FEMALE: Total length 3.55. Carapace 1.37 long, 1.13 wide. Abdomen 2.27 long, 1.13 wide, 1.10 high. Leg lengths: I 14.99, II 10.27, III 6.80, IV 10.46. Eye sizes and interdistances as in male. Clypeal height almost six times AME diameter. Coloration as in male. Receptacula wide, distinctly narrowed at about half of length (fig. 308).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Westland:* Jacobs River, Apr. 27, 1966, leaf litter (C. L. Wilton, R. R. Forster, OMD), 1♀; Lake Paringa, Sept. 26, 1966, under log (C. L. Wilton, OMD), 1♀, Feb. 17, 1984 (R. R. Forster, OMD), 1♂, 2♀.

DISTRIBUTION: Known only from Westland, South Island, New Zealand.

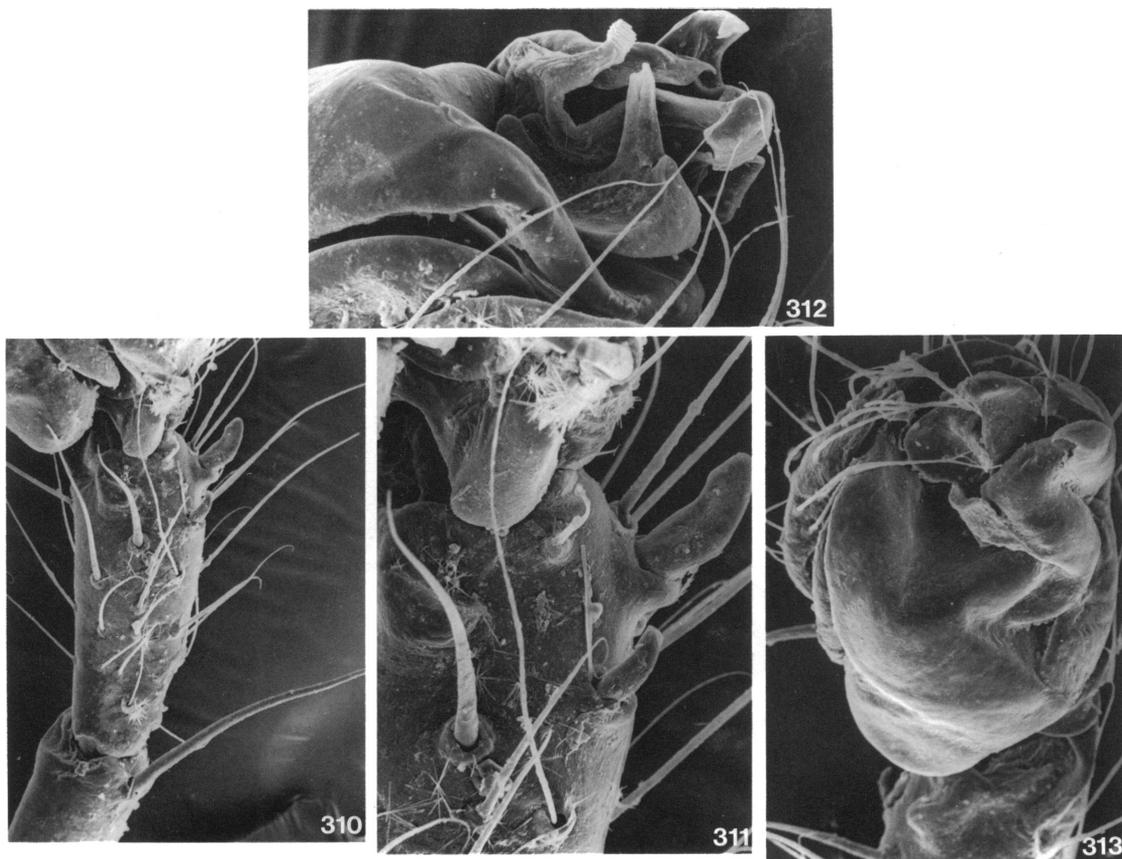
Mangua medialis Forster,
new species
Figures 310–315

TYPES: Male holotype and female allotype taken under log at Franz Josef, Westland, South Island, New Zealand (Apr. 29, 1951; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to the restriction of the species to the west coast of the South Island of New Zealand.

DIAGNOSIS: Males can be recognized by the thick, sinuous distal macroseta on the palpal tibia (figs. 310, 311), females by the elongate medial epigynal ducts (figs. 314, 315).

MALE: Total length 3.18. Carapace 1.54 long, 1.16 wide. Abdomen 1.93 long, 1.08 wide, 1.08 high. Leg lengths: I 14.25, II 9.24, III 6.78, IV 9.01. Eye sizes and interdistances: AME 0.04, ALE 0.08, PME 0.07, PLE 0.08; AME-AME 0.02, AME-ALE 0.02,



Figs. 310–313. *Mangua medialis*, new species, left male palp. 310, 311. Tibia and paracymbium, retrolateral views. 312, 313. Bulb, prolateral and ventral views.

PME-PME 0.07, PME-PLE 0.03, ALE-PLE 0.01; MOQ length 0.18, front width 0.10, back width 0.21. Clypeal height seven times AME diameter. Chelicerae 1.39 long, with five strong promarginal teeth. Type faded but other material shows abdominal pattern similar to that of *M. gunni*. Palp 3.08 long; tibia with two squat distal macrosetae (figs. 310, 311) and small curved bristle adjacent to paracymbium; bulb with folded distal apophyses (figs. 312, 313).

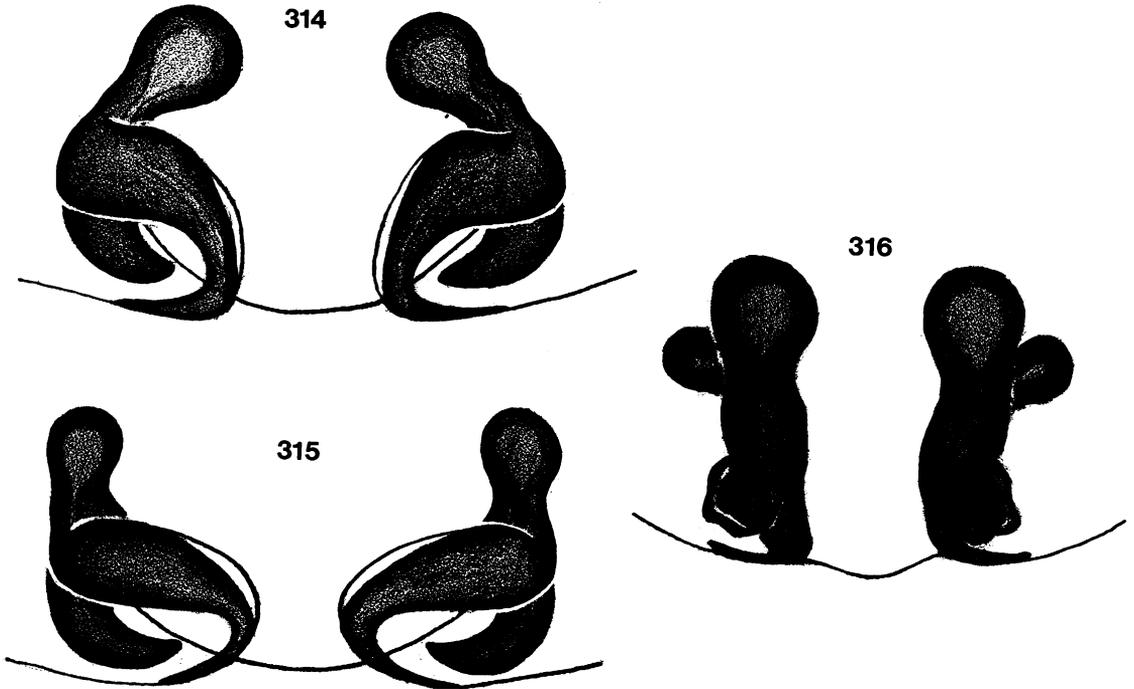
FEMALE: Total length 3.01. Carapace 1.16 long, 1.00 wide. Abdomen 1.93 long, 1.08 wide, 1.31 high. Leg lengths: I 11.94, II 8.01, III 5.85, IV 8.47. Eye sizes and interdistances as in male except that PME more widely spaced. Clypeal height eight times AME diameter. Chelicerae 0.62 long, teeth as in male. Coloration as in male. Medial epigynal ducts elongate (figs. 314, 315).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Westland:* Franz Joseph, Apr. 29, 1951 (R. R. Forster, OMD), 1♀, Feb. 10, 1984, leaf litter (R. R. Forster, OMD), 1♀; Mount Hercules, near Harihari, Feb. 10, 1984, leaf litter (R. R. Forster, OMD), 1♀; Springs Junction, Apr. 25, 1977, leaf litter (R. R. Forster, OMD), 1♀; Wataroa, Aug. 1952 (M. Warren, OMD), 2♀.

DISTRIBUTION: Known only from central Westland, South Island, New Zealand.

Mangua hughsoni Forster,
new species
Figures 316–318

TYPES: Male holotype and female allotype taken in forest at Old Taylorville Road, Westland, South Island, New Zealand (Nov. 6, 1950; L. P. Hughson), deposited in OMD.



Figs. 314–316. Epigynum of *Mangua*, dorsal views. 314, 315. *M. medialis*, new species. 316. *M. hughsoni*, new species.

ETYMOLOGY: The specific name is a patronym in honor of L. P. Hughson, who collected many interesting arachnids from the Westland region.

DIAGNOSIS: This species seems closely related to *M. medialis* but can be separated by the more closely spaced macrosetae on the male palpal tibia (figs. 317, 318) and the longitudinally oriented receptacula (fig. 316) of females.

MALE: Total length 2.76. Carapace 1.08 long, 0.92 wide. Abdomen 1.77 long, 1.08 wide, 0.10 high. Leg lengths: I 11.40, II 7.62, III 5.31, IV 7.55. Eye sizes and interdistances: AME 0.03, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.01, AME-ALE 0.02, PME-PME 0.06, PME-PLE 0.02, ALE-PLE 0.01; MOQ length 0.16, front width 0.07, back width 0.20. Clypeal height seven times AME diameter. Chelicerae relatively short (0.62), with five promarginal teeth. Specimen bleached but with faint pattern similar to that of *M. gunni*. Palp 2.70 long; tibia with two short, stout, adjacent macrosetae on distodorsal surface and long bristle adjacent to paracymbium (figs. 317, 318); patella almost twice as long as tibia.

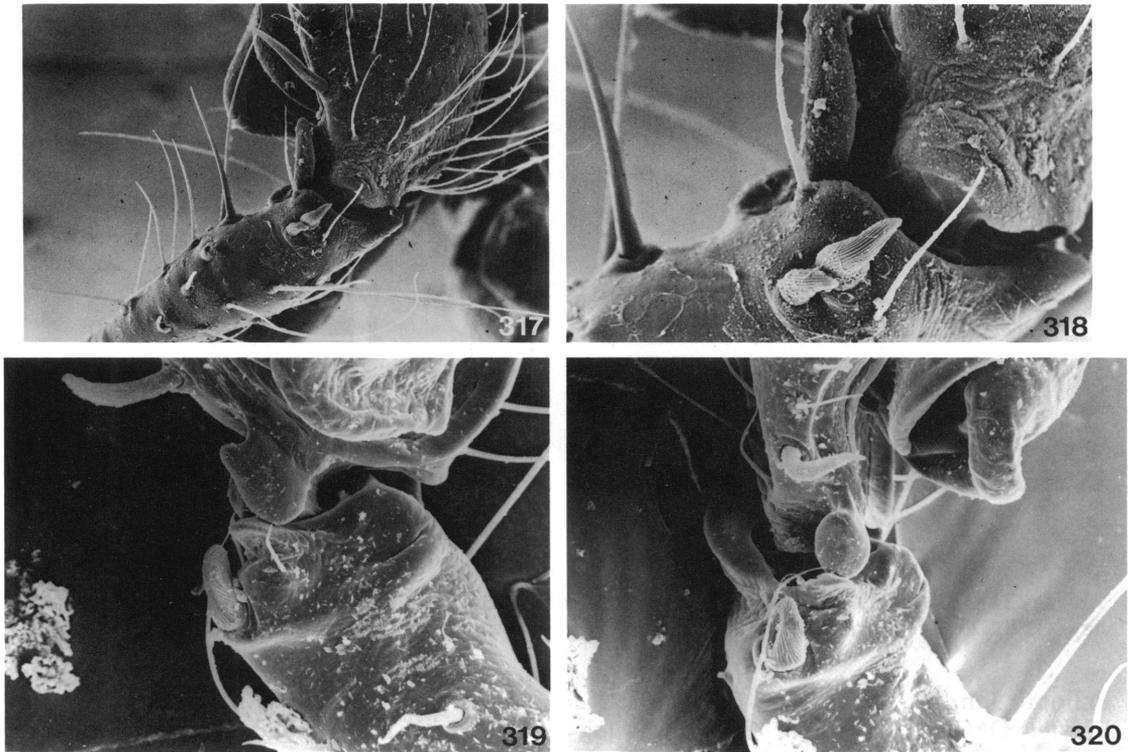
FEMALE: Total length 2.36. Carapace 0.92 long, 0.85 wide. Abdomen 1.54 long, 1.00 wide, 1.06 high. Leg lengths: I 10.32, II 6.62, III 5.24, IV 7.08. Eye sizes and interdistances, clypeal height, chelicerae, and coloration as in male. Receptacula longitudinally oriented (fig. 316).

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Westland:* Charleston, Nov. 10, 1950 (L. P. Hughson, OMD); Greymouth, Apr. 11, 1950 (L. P. Hughson, OMD); Old Taylorville Road, Nov. 6, 1950 (L. P. Hughson, OMD), 4♀.

DISTRIBUTION: This species appears to replace *M. medialis* geographically; the latter species is found further south along Westland, South Island, New Zealand.

Mangua flora Forster,
new species
Figures 319–321, 324

TYPES: Male holotype beaten from low foliage in *Nothofagus* forest at Flora Hut, Mount Arthur Tableland, Nelson, South Island, New Zealand (Jan. 28, 1948; R. R. Forster), deposited in NMW, and female allotype taken



Figs. 317–320. 317, 318. *Mangua hughsoni*, new species, left male palpal tibia and paracymbium, retrolateral views. 319, 320. *M. flora*, new species, right male palpal tibia and paracymbium, oblique ventral and retrolateral views.

under log on Flora Track, Nelson, South Island, New Zealand (Apr. 7, 1946; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

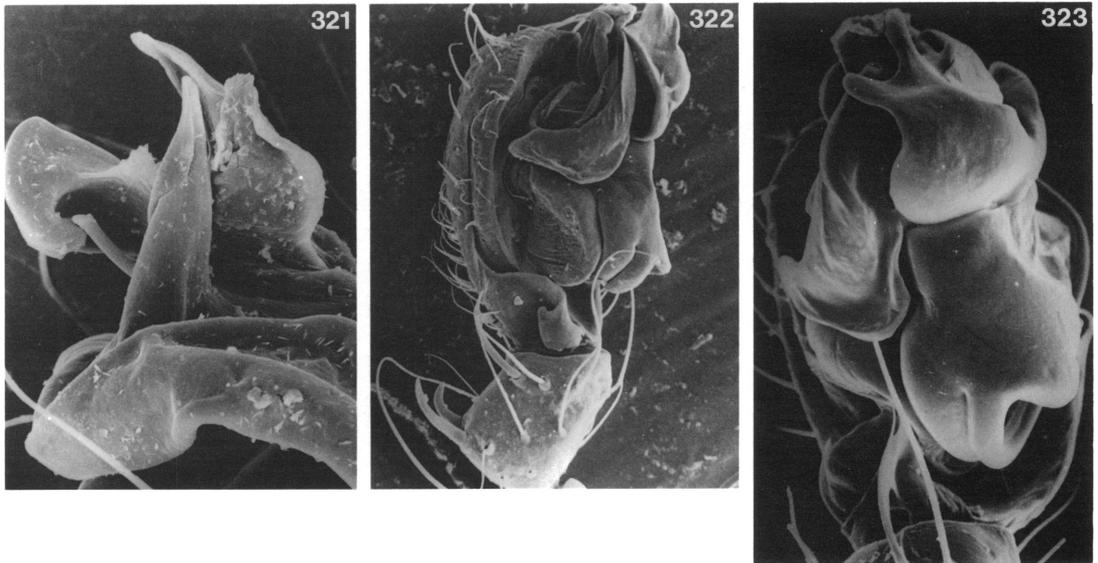
DIAGNOSIS: This species seems closely related to *M. medialis* and *M. hughsoni* but can be separated by the extremely short, single distal macroseta on the male palpal tibia (figs. 319, 320) and the bilobed receptacula (fig. 324) of females.

MALE: Total length 3.48. Carapace 1.54 long, 1.23 wide. Abdomen 1.98 long, 1.26 wide, 1.26 high. Leg lengths: I 14.40, II 10.78, III 8.16, IV 11.17. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.07, PME-PLE 0.01, ALE-PLE 0.01; MOQ length 0.18, front width 0.09, back width 0.21. Clypeal height seven times AME diameter. Chelicerae 0.92 long, with

five promarginal teeth. Specimen bleached but abdominal pattern apparently similar to that of *M. gunni*. Palp 3.16 long; patella slightly more than twice as long as tibia; tibia with single short, stout macroseta on distodorsal surface (figs. 319, 320); bulbal apophyses as in figure 321.

FEMALE: Total length 2.76. Carapace 1.16 long, 1.00 wide. Abdomen 1.69 long, 1.54 wide, 1.52 high. Leg lengths: I 11.32, II 7.55, III 6.39, IV 7.70. Eye sizes and interdistances, clypeal height, chelicerae, and coloration as in male. Internal genitalia (fig. 324) with paired receptacula fused, forming bilobed structure.

OTHER MATERIAL EXAMINED: NEW ZEALAND: **South Island:** *Nelson:* Flora Hut, Jan. 21, 1948, under log (R. R. Forster, NMW), 1♀; Mount Arthur Tableland, Feb. 20, 1946, elev. 4600 ft (R. R. Forster, OMD), 1♂, Jan. 28, 1948 (R. R. Forster, NMW), 1♂, 1♀; Mount



Figs. 321–323. 321. *Mangua flora*, new species, distal elements of right male palpal bulb, ventral view. 322, 323. *M. forsteri* (Brignoli), right male palp, retrolateral and ventral views.

Balloon, Jan. 20, 1948, from foliage (R. R. Forster, OMD), 1♂, Jan. 26, 1948, under log (R. K. Dell, NMW), 1♀.

DISTRIBUTION: Known only from Nelson, South Island, New Zealand.

Mangua convoluta Forster,
new species

Figure 326

TYPE: Female holotype taken from moss on floor of *Nothofagus* forest at Riordan's Creek, Lewis Pass, Canterbury, South Island, New Zealand (Apr. 25, 1977; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name refers to the internal female genitalia.

DIAGNOSIS: The highly looped form of the female internal genitalia is unique within the genus (fig. 326).

MALE: Unknown.

FEMALE: Total length 2.78. Carapace 0.92 long, 1.00 wide. Abdomen 2.00 long, 1.39 wide, 1.40 high. Leg lengths: I 10.70, II 7.16, III 5.62, IV 7.24. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.06, PLE 0.07; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.07, PME-PLE 0.01, ALE-PLE 0.01; MOQ length 0.14, front width 0.09, back width 0.19. Clypeal height almost seven

times AME diameter. Chelicerae small, 0.69 long, with five promargin teeth. Abdomen with typical dark patterning. Internal genitalia (fig. 326) with ducts heavily sclerotized, apparently without defined receptaculum.

OTHER MATERIAL EXAMINED: A second female taken with the holotype (OMD).

DISTRIBUTION: Known only from Canterbury, South Island, New Zealand.

Mangua oparara Forster,
new species

Figure 325

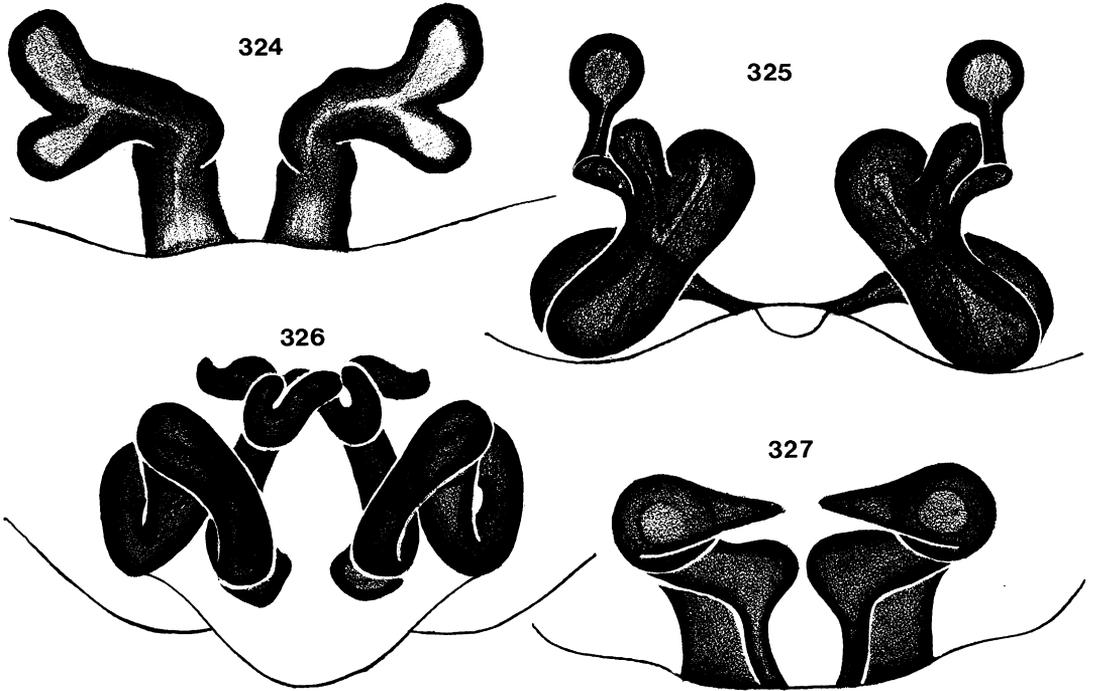
TYPE: Female holotype taken under log at Oparara, Nelson, South Island, New Zealand (Sept. 28, 1966; R. R. Forster), deposited in OMD.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The species is characterized by the unique form of the female genitalia, with small, spherical, anteriorly situated receptacula on distinct, narrow stalks (fig. 325).

MALE: Unknown.

FEMALE: Total length 2.60. Carapace 1.00 long, 0.77 wide. Abdomen 1.69 long, 1.23 wide, 1.16 high. Leg lengths: I missing, II 5.31, III 2.62, IV 5.85. Eye sizes and interdistances: AME 0.03, ALE 0.07, PME 0.07,



Figs. 324–327. Epigynum of *Mangua*, dorsal views. 324. *M. flora*, new species. 325. *M. oparara*, new species. 326. *M. convoluta*, new species. 327. *M. forsteri* (Brignoli).

PLE 0.07; AME-AME 0.01, AME-ALE 0.01, PME-PME 0.07, PME-PLE 0.01, ALE-PLE 0.01; MOQ length 0.16, front width 0.07, back width 0.21. Clypeal height seven times AME diameter. Chelicerae 0.39 long, with five promarginal teeth. Coloration typical. Receptacula tiny, situated anteriorly on narrow stalks (fig. 325).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Nelson, South Island, New Zealand.

Mangua forsteri (Brignoli),
new combination
Figures 322, 323, 327

Linyphia setosa Forster, 1964: 100, figs. 127–132 (male holotype from Tucker Cove, Campbell Island, New Zealand, in NMW, examined). Preoccupied by *Linyphia setosa* O. P.-Cambridge, 1863.

Linyphia forsteri Brignoli, 1983: 303 (replacement name for *Linyphia setosa* Forster).

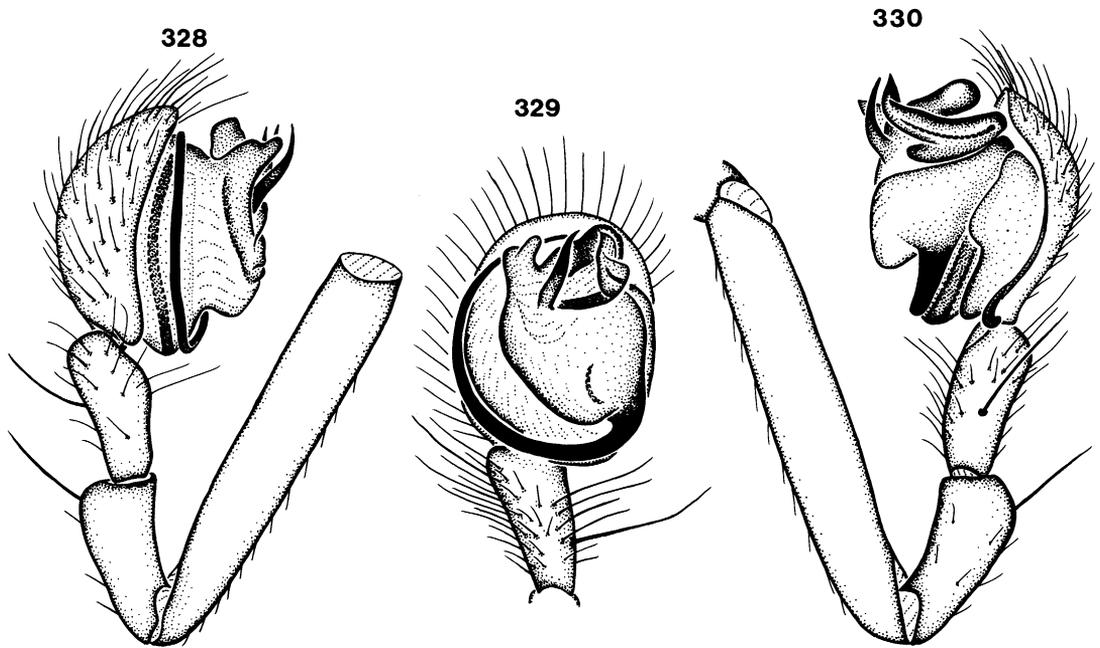
DIAGNOSIS: This species can be separated from all other *Mangua* by the different ab-

dominal pattern, the short palpal tibia with basal macrosetae (fig. 322), and the short, wide epigynal ducts (fig. 327); it was originally placed in *Linyphia* by default until the mainland New Zealand fauna could be described.

MALE: Described by Forster (1964). Total length 2.14. The broad pale unpigmented dorsal patch on the abdomen is distinctive. The palpal bulb (figs. 322, 323) is much more complex than in other *Mangua* species and the form of the tibial macrosetae is distinctive.

FEMALE: Described by Forster (1964). Total length 1.61. The internal genitalia (fig. 327) do not closely resemble those of the mainland species.

OTHER MATERIAL EXAMINED: NEW ZEALAND: **Auckland Islands:** Magnetic Cove, Adams Island, Jan. 20, 1966, Berlese, litter from *Dracophyllum* bases (K. A. J. Wise, NMW), 1♂. **Campbell Island:** Rocky Bay, Nov. 28, 1951, from *Anisotome* (Gressitt, NMW), 1♀ (allotype); Tucker Cove, under boards, Jan. 1947 (J. H. Sorensen, NMW),



Figs. 328-330. *Chileotaxus sans*, new species, left male palp, prolateral, ventral, and retrolateral views.

1♂ (holotype), Nov. 21, 1947, from old timber (J. H. Sorensen, NMW), 1♀; no specific locality, Aug. 1964 (A. Wright, OMD), 1♂.

DISTRIBUTION: The original records were restricted to Campbell Island but the present material extends the range to include the Auckland Islands. A single male (EDA) is labeled Waikaremoana, Waikari-iti Track, Dec. 10, 1946, J. T. Salmon, but is probably mislabeled.

CHILEOTAXUS PLATNICK, NEW GENUS

TYPE SPECIES: *Chileotaxus sans*, new species.

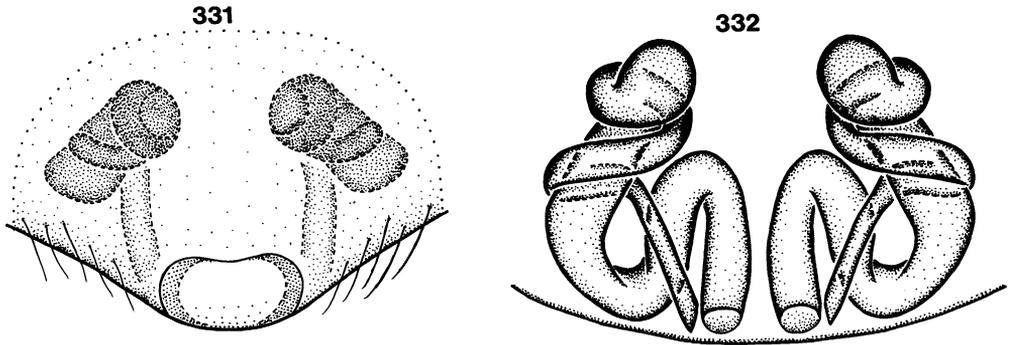
ETYMOLOGY: The generic name is a contraction of Chilean *Synotaxus*, and is masculine in gender.

DIAGNOSIS: Members of this genus are likely to be confused only with *Synotaxus* Simon, but males lack the spiniform male palpal macrosetae characteristic of that genus, and females have more complex epigynal ducts.

DESCRIPTION: Small (total length 1.9-2.3) spiders with elongate legs and triangular ab-

domens in both sexes. Carapace longer than wide, smoothly narrowed anteriorly; thoracic groove a shallow triangular depression with apex of triangle directed posteriorly. Eyes spread across almost total width of pars cephalica; AME dark, smaller than other subequal eyes; from above, posterior eye row slightly, anterior row strongly, procurved; MOQ wider in back than in front and than long; clypeal height about four times AME diameter. Chelicerae not enlarged, with pro-marginal teeth and retromarginal denticles (fig. 337). Endites angled in front of labium, almost touching anteriorly. Sternum slightly longer than wide, not tuberculate. Leg formula 1243, with first pair much longer than other legs. Abdomen unpigmented (in alcohol, although the spiders may be green in life, as in *Synotaxus*). Male palpal femur longer than patella plus tibia; patella with long, subdistal, nonspini-form macroseta; tibia with weak retrolateral similar but weaker macroseta; embolus heavily sclerotized, curling around prolateral surface of bulb. Epigynum a slightly produced lobe; ducts complex.

DISTRIBUTION: Known only from Chile.



Figs. 331, 332. *Chileotaxus sans*, new species, epigynum, ventral and dorsal views.

Chileotaxus sans Platnick,
new species

Figures 328–332, 336–338

TYPES: Male holotype and female allotype collected at an elevation of 10 m along a roadside at night in Chaitén, Palena, Region de los Lagos (X), Chile (Jan. 16, 1986; N. I. Platnick, P. A. Goloboff, R. T. Schuh), deposited in AMNH.

ETYMOLOGY: The specific name is an arbitrary combination of letters.

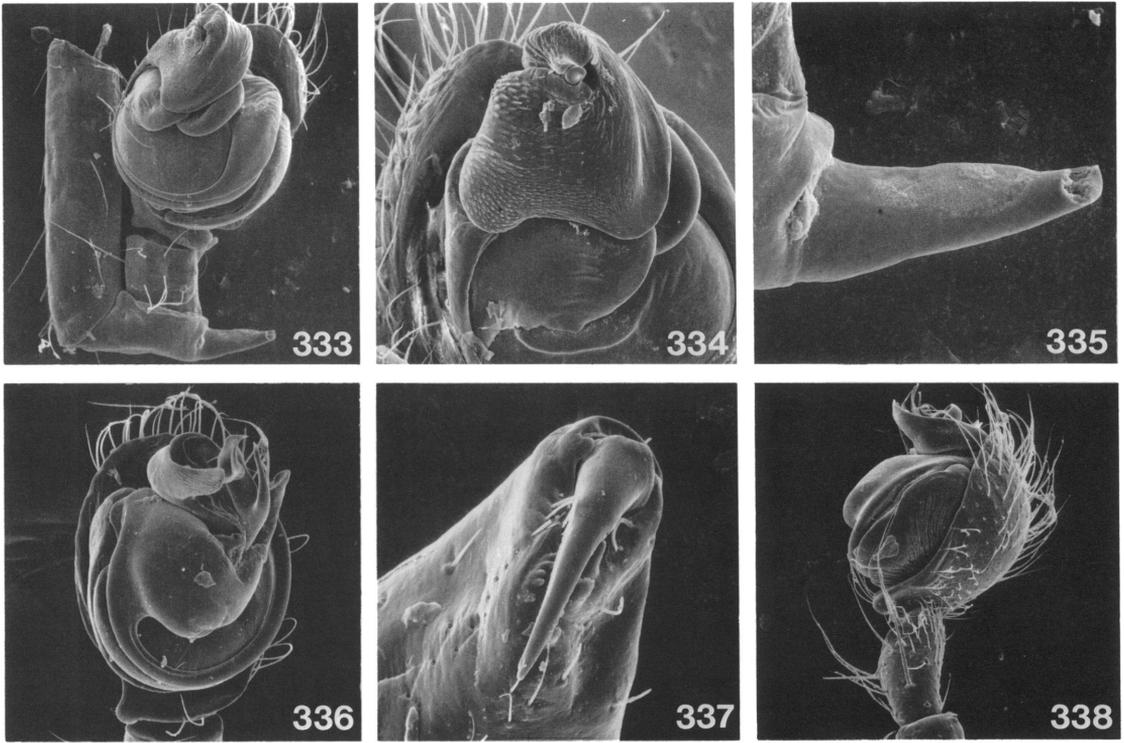
DIAGNOSIS: With the characters of the genus and genitalia as in figures 328–332.

MALE. Total length 2.25. Carapace 1.14 long, 0.83 wide. Abdomen 1.17 long, 0.90 wide. Leg lengths: I 13.73, II 8.89, III 4.84, IV 6.45. Eye sizes and interdistances: AME 0.04, ALE 0.05, PME 0.06, PLE 0.05; AME-AME 0.06, AME-ALE 0.10, PME-PME 0.12, PME-PLE 0.08, ALE-PLE 0.01; MOQ length 0.15, front width 0.14, back width 0.23. Clypeal height over four times AME diameter. Carapace pale yellow with gray (sometimes faded to pale orange) longitudinal stripes along lateral margins of pars thoracica; abdomen white with transverse gray patch at about half of length, patch often broken at middle or completely faded. Palp 1.31 long, patella expanded dorsodistally, where bearing long macroseta; tibia with weak retrolateral macroseta; embolus coiling around distal end of tegulum (figs. 328–330, 336, 338).

FEMALE: Total length 1.99. Carapace 0.94 long, 0.76 wide. Abdomen 1.12 long, 0.90 wide. Leg lengths: I 11.74, II 7.20, III 4.05, IV 5.96. Eye sizes and interdistances: AME

0.04, ALE 0.05, PME 0.05, PLE 0.06; AME-AME 0.06, AME-ALE 0.07, PME-PME 0.12, PME-PLE 0.06, ALE-PLE 0.01; MOQ length 0.18, front width 0.14, back width 0.22. Clypeal height about three times AME diameter. Coloration as in male. Epigynum with posterior openings, ducts visible through cuticle anteriorly (fig. 331); epigynal ducts complexly folded (fig. 332).

OTHER MATERIAL EXAMINED: CHILE: **Region del Bío-Bío (VIII):** *Concepción:* Bosque de Ramuntcho, near Concepción, Oct. 14–16, 1961 (A. F. Archer, Artigas, AMNH), 2♀. *Bío-Bío:* El Manzano, near Contulmo, Dec. 15, 1985 (L. E. Peña G., AMNH), 7♂, 2♀. **Region de la Araucanía (IX):** *Cautín:* Chacamo, NW Nueva Imperial, W Temuco, Feb. 16–24, 1981, elev. 600–700 m (L. E. Peña G., AMNH), 4♂, 3♀; 15–30 km S Cherquenco, Feb. 26, 1989 (L. E. Peña G., AMNH), 2♀. **Region de los Lagos (X):** *Valdivia:* Las Trancas, W La Unión, Feb. 6–10, 1988, elev. 500 m (L. E. Peña G., AMNH), 1♀. *Osorno:* Aguas Calientes, Parque Nacional Puyehue, Jan. 2–5, 1982, elev. 500 m (L. E. Peña G., AMNH), 1♀, Jan. 27, 1986, elev. 450 m, wet forest (N. I. Platnick, R. T. Schuh, AMNH), 1♂, 3♀; Anticura, E Puyehue, Aug. 26–Sept. 5, 1983 (L. E. Peña G., AMNH), 1♂; 4.1 km E Anticura, Parque Nacional Puyehue, Dec. 19–26, 1982, elev. 430 m, screen sweeping at dusk, valdivian rainforest (A. Newton, M. Thayer, AMNH), 7♂, 20♀; 36 km W La Unión, Mar. 25–28, 1987, elev. 600 m (L. E. Peña G., AMNH), 5♂, 9♀; Pajaritos, 8 km W Argentina boundary, Feb. 9, 1988 (T. Cekalovic K., AMNH), 1♀; Parque Nacional Puyehue,



Figs. 333–338. 333–335. *Synotaxus turbinatus* Simon, male. 336–338. *Chileotaxus sans*, new species, male. 333, 338. Left palp, retrolateral view. 334, 336. Right palp, ventral view. 335. Spiniform macroseta on palp patella, retrolateral view. 337. Chelicera, medial view.

Feb. 12–22, 1979, elev. 600 m (L. E. Peña G., AMNH), 2♂, 8♀; Pucatrihue, Feb. 1–10, 1980, coast (L. E. Peña G., AMNH), 4♂, 2♀. *Llanquihue*: El Chingue, N Correntoso, Jan. 20–25, 1980 (L. E. Peña G., AMNH), 1♀; Isla Tenglo, Puerto Montt, Mar. 1, 1962 (A. F. Archer, Bitner, AMNH), 1♀; Lago Chapo, 13.5 km E Correntoso, Dec. 16–27, 1982, elev. 310 m, window trap in valdivian rainforest (A. Newton, M. Thayer, AMNH), 1♀. *Chiloé*: Chepu, Isla de Chiloé, Jan. 30, 1981 (L. E. Peña G., AMNH), 2♀; Dalcahue, NE Castro, Isla de Chiloé, Feb. 1, 1981 (L. E. Peña G., AMNH), 1♂; Pío-Pío, Isla de Chiloé, Mar. 10–12, 1987 (L. E. Peña G., AMNH), 1♂, 3♀; Piroquina, Cordillera San Pedro, Mar. 10–11, 1987, elev. 500 m (L. E. Peña G., AMNH), 1♂; Terao, S Chonchi, Isla de Chiloé, Mar. 10–20, 1988 (L. E. Peña G., USNM), 1♂, 1♀. *Palena*: Chaitén, Jan. 16, 1986, elev. 10 m, roadside at night (N. I. Platnick, P. A. Goloboff, R. T. Schuh, AMNH), 5♂, 2♀; 37 km

SE Chaitén, Dec. 28, 1984–Jan. 30, 1985, elev. 60 m, flight intercept trap, secondary forest, riverside (S. and J. Peck, AMNH), 1♂.

DISTRIBUTION: Known only from south-central Chile, from Concepción to Chaitén.

SYNOTAXUS SIMON

Figures 333–335

Synotaxus Simon, 1894: 495 (type species by original designation *Synotaxus turbinatus* Simon).

The genus *Synotaxus* was revised by Exline and Levi (1965), who recognized six species found from Costa Rica to Ecuador and Brazil; no additional species have subsequently been described. We note here only morphological details needed for comparison with the taxa described above. The ocular area of some species bears macrosetae (Exline and Levi, 1965: figs. 32, 34). The chelicerae have pro-marginal teeth and retromarginal denticles. The legs are elongated, with leg I longest, and

spineless (Exline and Levi, 1965: figs. 17, 24). The male palp (figs. 333–335) has a distinct basal paracymbium; depending on the species, the palpal femur, patella, and/or tibia bear strong macrosetae that are often greatly enlarged and spiniform. The retrolateral cymbial margin bears a wide, deep incision. The

internal female genitalia have fertilization ducts that are “much more sclerotized than in the other theridiid genera” (Exline and Levi, 1965: 179). The spiders construct a unique, latticelike (“chicken-wire”) web (Eberhard, 1977: figs. 1, 3; Stowe, 1985: fig. 4; Coddington, 1986: fig. 12.4).

RELATIONSHIPS AND FAMILIAL PLACEMENT

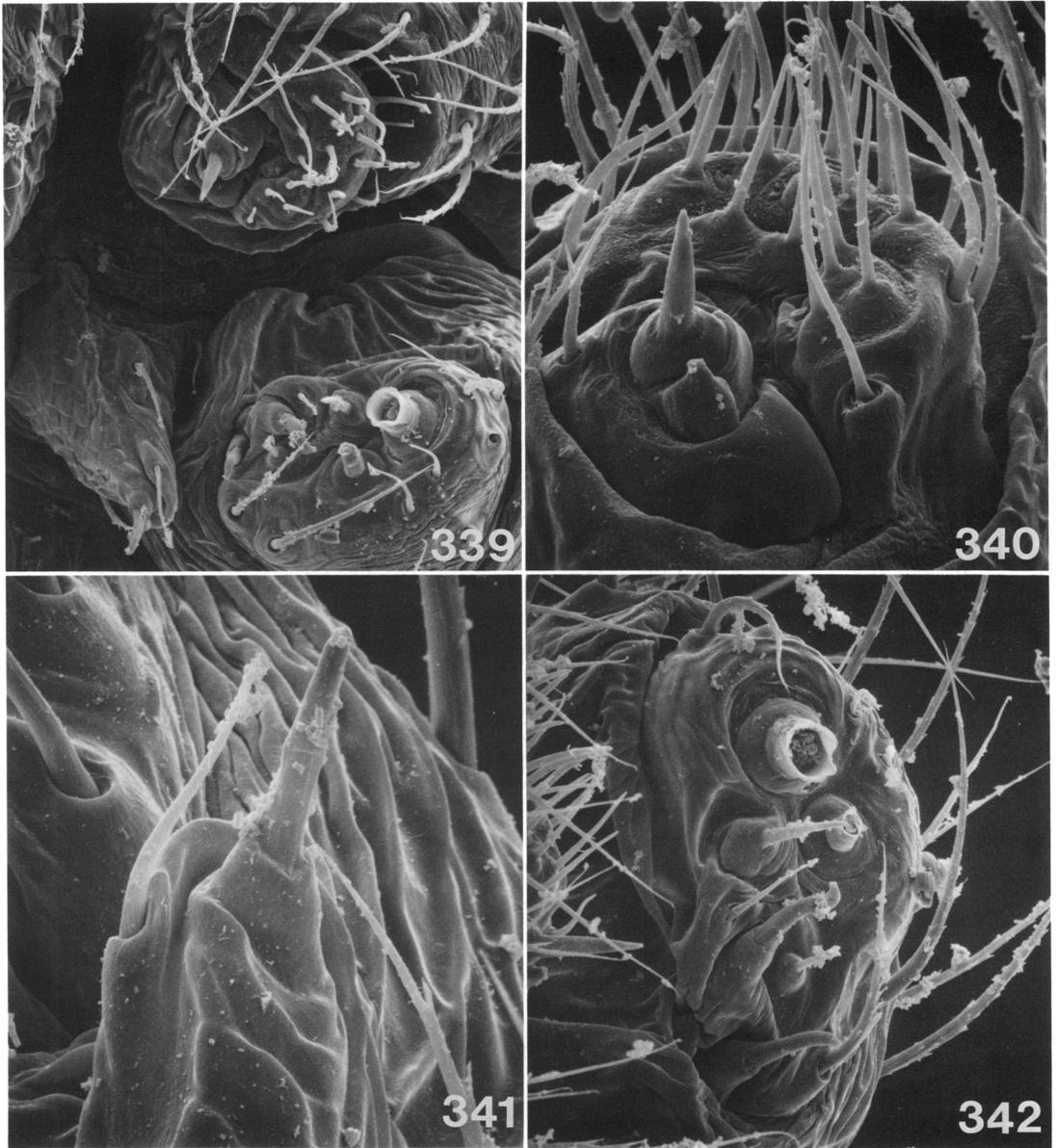
Of the spiders considered above, only those of the genus *Synotaxus* are at all widely known among arachnologists. Because *Synotaxus* has traditionally been considered a member of the family Theridiidae, we begin this discussion with some observations about theridiids and their relatives.

Based on currently available information, most workers agree that the members of three classically recognized spider families, the Theridiidae, Nesticidae, and Hadrotarsidae, together form a monophyletic group within the superfamily Araneoidea. The Theridiidae and Nesticidae have been recognized in virtually all spider classifications; Wunderlich (1978, 1986) suggested that Hadrotarsidae is a junior synonym of Theridiidae, but his suggestion has not been widely accepted (Baert, 1984a, b; Davies, 1985).

The primary synapomorphy that has been used to support the grouping of these families is the presence of a “tarsal comb” on the fourth pair of legs. The “comb” consists of a series of ventrally situated, serrated bristles that are somewhat thicker at their base than the normal leg setae, and that become increasingly shorter toward the distal end of the tarsus; it apparently functions, in many taxa, in the handling of viscid silk during wrap attacks on prey. The character, although classical, is not unambiguous; in taxa in which the normal leg setae are serrated, it can be difficult, or even impossible, to determine whether or not the ventral setae on tarsus IV form a true “comb.” This ambiguity seems well reflected, for example, in the description provided by Exline and Levi (1965: 177) for the character in *Synotaxus*: “Comb on fourth tarsi usually lacking with a row of unserrated bristles in some specimens but with several serrated bristles present in others.”

Coddington (1986: 335) suggested that at least the theridiids may be united by “the possession of ‘lobed’ aggregate glands and the use of sticky silk in the wrap attack to subdue prey.” Whether nesticids have lobed aggregate glands is unknown, but as Coddington (op. cit.) indicated, “The comb setae on nesticid fourth tarsi are similar to those of theridiids,” and at least *Nesticus* Thorell and *Eidmanella* Roewer are known to use a sticky silk wrap attack (Coddington, personal obs.). Carico (1978) reported sticky silk wrap attacks in *Euryopsis* Menge, which we consider a close relative of *Hadrotarsus* Thorell (see below). Baert (1984a: 615) indicated that a tarsal comb is lacking in typical hadrotarsids, but we have seen Australian hadrotarsid specimens with serrated bristles that could as easily be interpreted as a comb as can the serrated setae found in many classical theridiids that have apparently lost the full comb (Levi and Randolph, 1975).

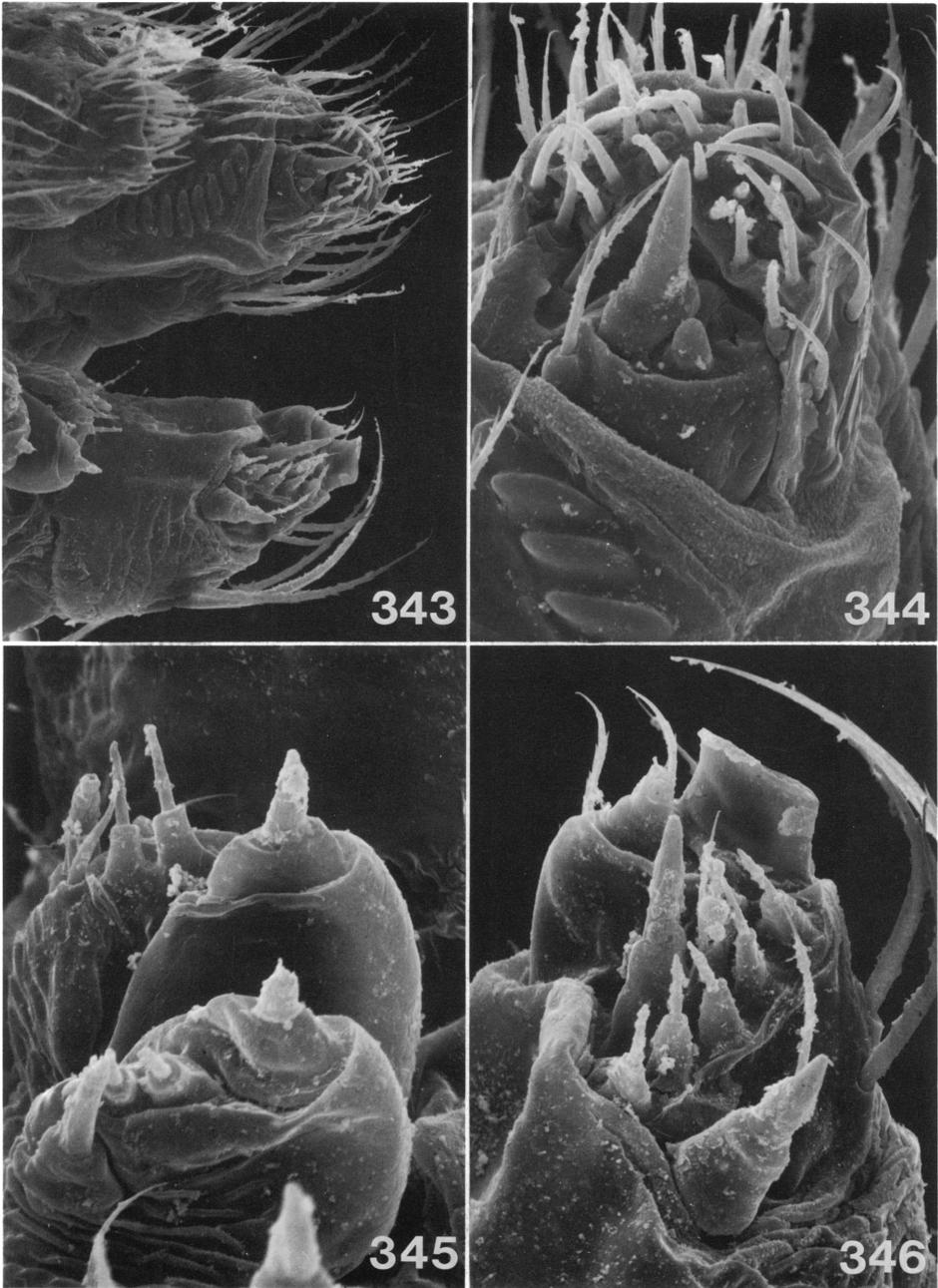
Fortunately, Coddington (1989) has supplied a possibly correlated synapomorphy that is much more accessible than gland morphology in normal museum specimens, and that seems to unite the three families. The posterior lateral spinnerets bear highly modified spigots that are much wider than any other spigots on any of the spinnerets; illustrations are provided here for the nesticid genera *Nesticus* (figs. 339–342) and *Eidmanella* (fig. 374) and the theridiid genera *Diploena* Thorell (figs. 343–346), *Euryopsis* (figs. 347–350), *Enoplognatha* Pavesi (figs. 351–354), *Argyrodes* Simon (figs. 355–358, note that one aggregate spigot is secondarily lost), *Steatoda* Sundevall (figs. 359–362), *Anelosimus* Simon (figs. 363–366), *Achaearanea* Strand (figs. 367–370), *Theridula* Emerton (fig. 371), and *Latrodectus* Walckenaer (fig.



Figs. 339–342. *Nesticus sheari* Gertsch, female spinnerets. 339. Left spinneret group. 340. Anterior lateral spinneret, close-up. 341. Posterior median spinneret, close-up. 342. Posterior lateral spinneret, close-up.

373). The widened spigots presumably serve the modified aggregate glands found in these groups; Coddington (1989) also demonstrated their presence in *Gaucelmus* Keyserling among nesticids, and Hickman (1942: 150, fig. 15) observed at least one widened spigot in *Hadrotarsus* (using compound microscopy

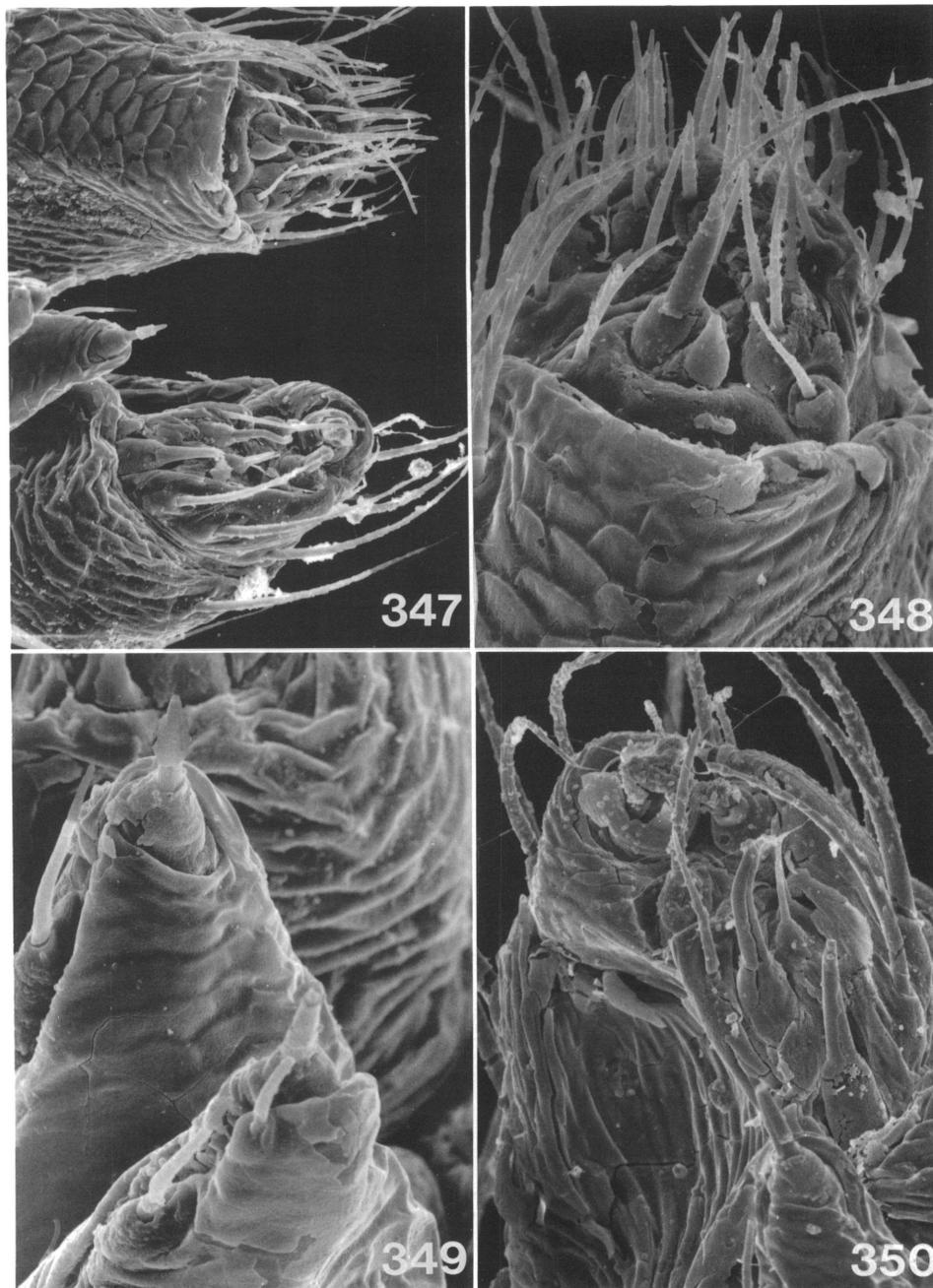
only; their presence can often be confirmed by normal light microscopy). Hickman also found that “very large pear-shaped glands” served the widened spigots; these glands may well be homologs of those found in theridiids. Nevertheless, in typical theridiids both aggregate gland spigots are enormously wider



Figs. 343–346. *Diploena beni* Levi, female spinnerets. 343. Left spinneret group. 344. Anterior lateral spinneret, close-up. 345. Posterior median spinneret, close-up. 346. Posterior lateral spinneret, close-up.

than normal araneoid aggregate spigots (figs. 354, 358, 362, 366, 370, 371, 373), whereas at least one spigot is definitely enlarged in nesticids (figs. 342, 374), but somewhat less

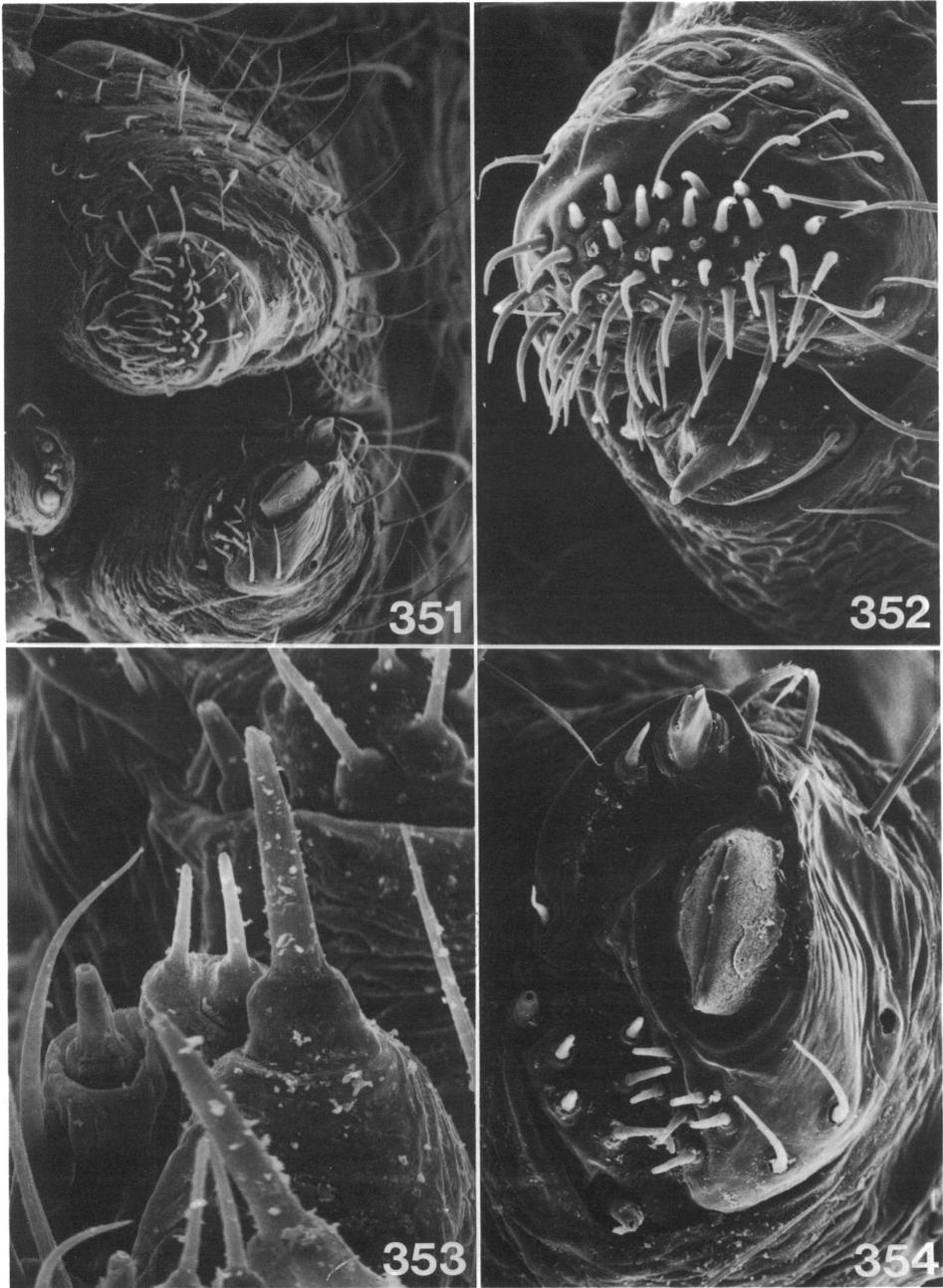
so than in typical theridiids. By outgroup comparison to the normal araneoid condition (e.g., *Araneus* Clerck, *Leucauge* White, *Mecynogea* Simon, *Frontinella* F. O. P.-



Figs. 347–350. *Euryopsis funebris* (Hentz), female spinnerets. 347. Left spinneret group. 348. Anterior lateral spinneret, close-up. 349. Posterior median spinneret, close-up. 350. Posterior lateral spinneret, close-up.

Cambridge; Coddington, 1989: figs. 13, 17, 25, 41), therefore, nesticids and theridiids are united by an increase in aggregate spigot width, and typical theridiids by a much great-

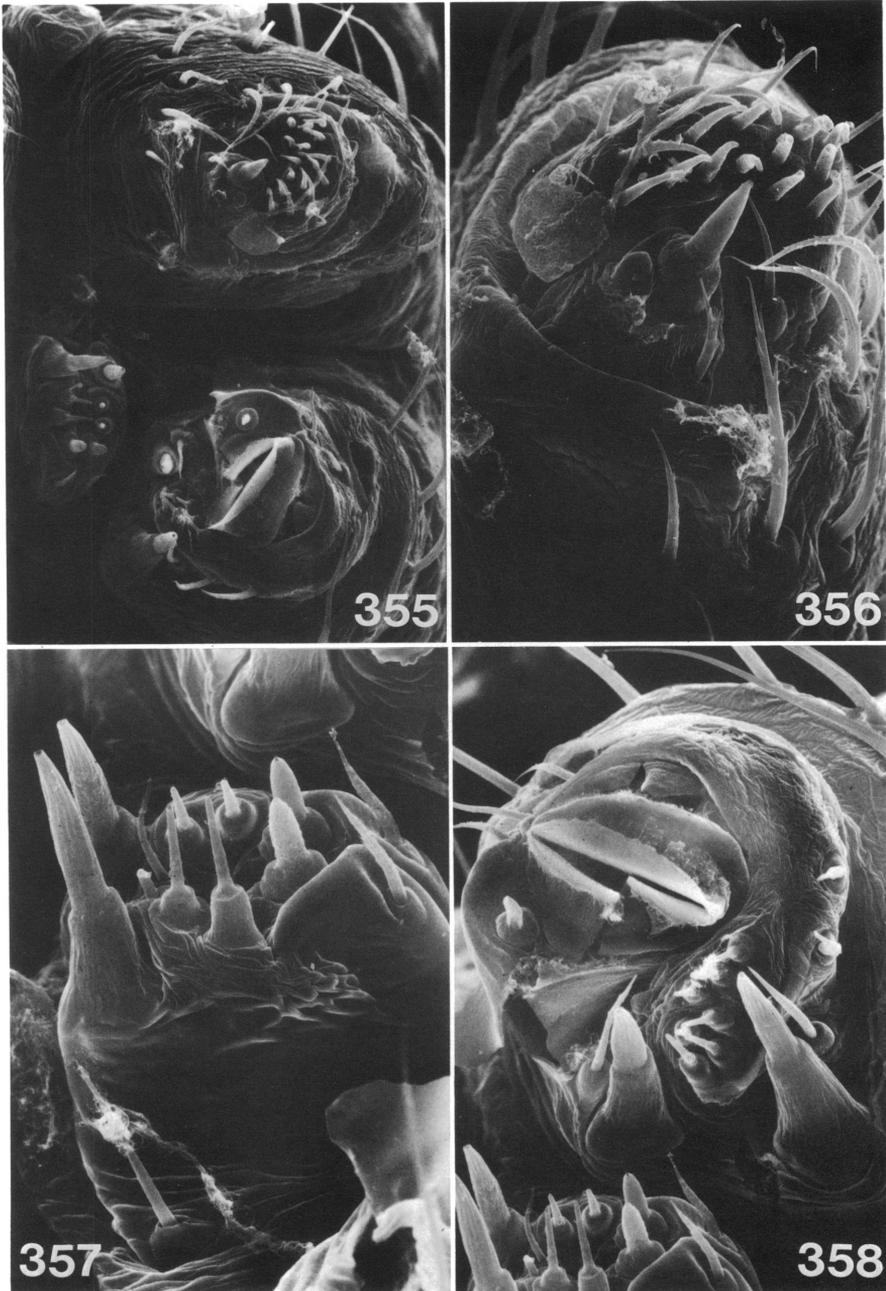
er aggregate spigot width than is observed in nesticids. The condition in *Dipoena* (fig. 346) and especially in *Euryopsis* (fig. 350) is, on the whole, similar to that in nesticids.



Figs. 351–354. *Enoplognatha ovata* (Clerck), female spinnerets. 351. Left spinneret group. 352. Anterior lateral spinneret, close-up. 353. Posterior median spinneret, close-up. 354. Posterior lateral spinneret, close-up.

Finally, there are two features of male palpal morphology that may unite the classical theridiids, hadrotarsids, and nesticids. First, Coddington (1990) has argued that all three

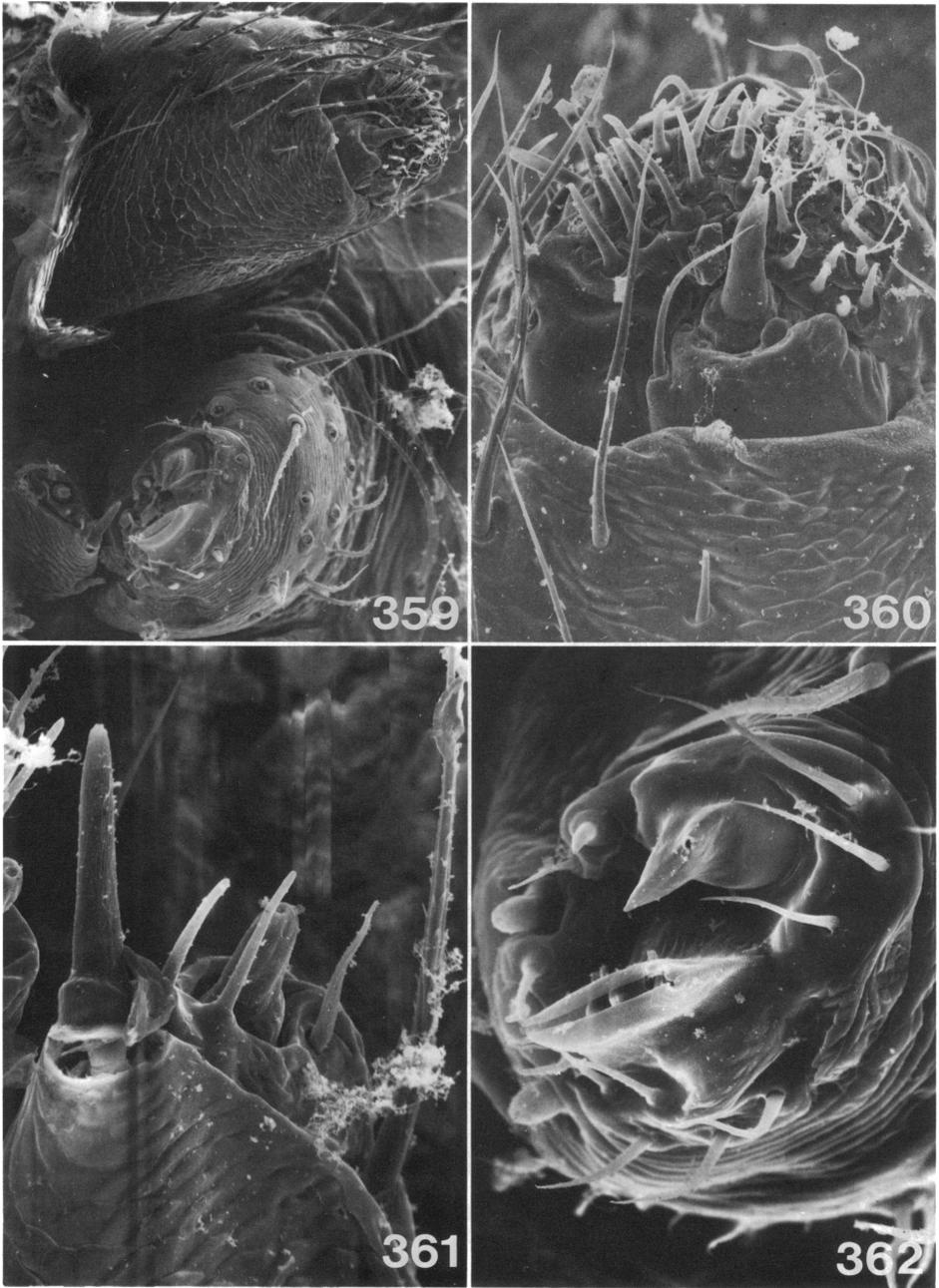
groups have a tegular lobe, termed the “theridiid tegular apophysis,” that is unique among araneoids. This tegular lobe has generally been misconstrued to be the “median apophysis”



Figs. 355–358. *Argyrodes trigona* (Hentz), female spinnerets. 355. Left spinneret group. 356. Anterior lateral spinneret, close-up. 357. Posterior median spinneret, close-up. 358. Posterior lateral spinneret, close-up.

in theridiids. Nesticids differ from typical theridiids and hadrotarsids in that their tegular lobe does not form part of an interlocking mechanism with the paracymbium that

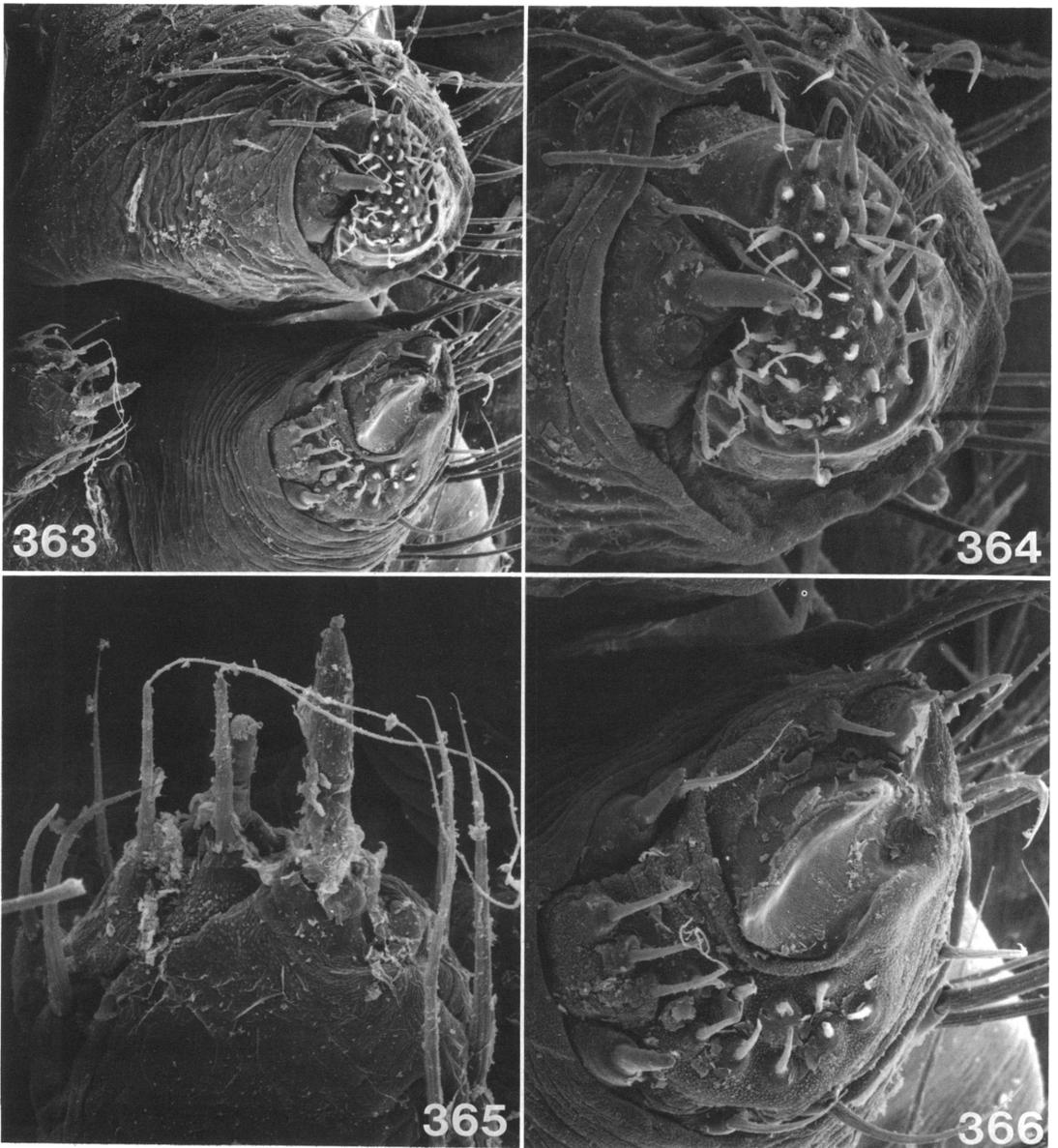
anchors the unexpanded bulb, and the homology of the nesticid tegular lobe with that of theridiids and hadrotarsids therefore needs further study. Because a loop of the sperm



Figs. 359–362. *Steatoda borealis* (Hentz), female spinnerets. 359. Left spinneret group. 360. Anterior lateral spinneret, close-up. 361. Posterior median spinneret, close-up. 362. Posterior lateral spinneret, close-up.

duct passes through the theridiid tegular apophysis, Coddington (1990) suggested that the homology “could be tested by finding the reservoir of the sperm duct in the lobes” of nesticid palpi.

A second potential palpal synapomorphy is that males of all three families have a characteristically conical palpal tibia. Although the length of that segment varies tremendously within these families, the basal por-

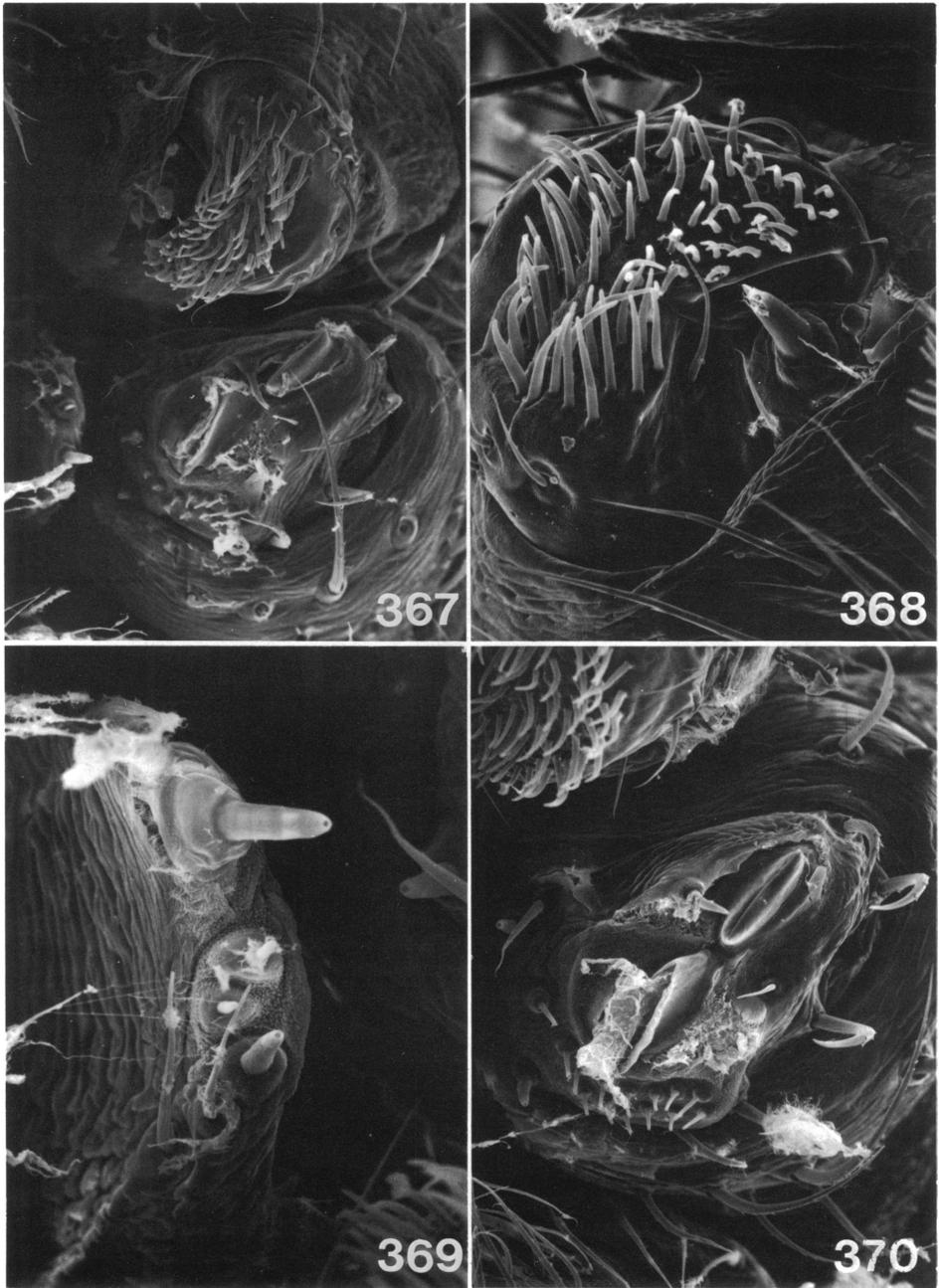


Figs. 363–366. *Anelosimus eximius* (Keyserling), female spinnerets. **363.** Left spinneret group. **364.** Anterior lateral spinneret, close-up. **365.** Posterior median spinneret, close-up. **366.** Posterior lateral spinneret, close-up.

tion of the tibia seems always to be notably smaller in diameter than the distal portion. A much broader survey of palpal tibial shape within the Araneoidea will be necessary before a conical tibia could be accepted as a synapomorphy of this lineage, but the only exceptions we have noted within the three families are in *Synotaxus* and the Californian

species originally described as *Archerius mendocino* by Levi (1957; see below). Levi (1986: 95) noted that:

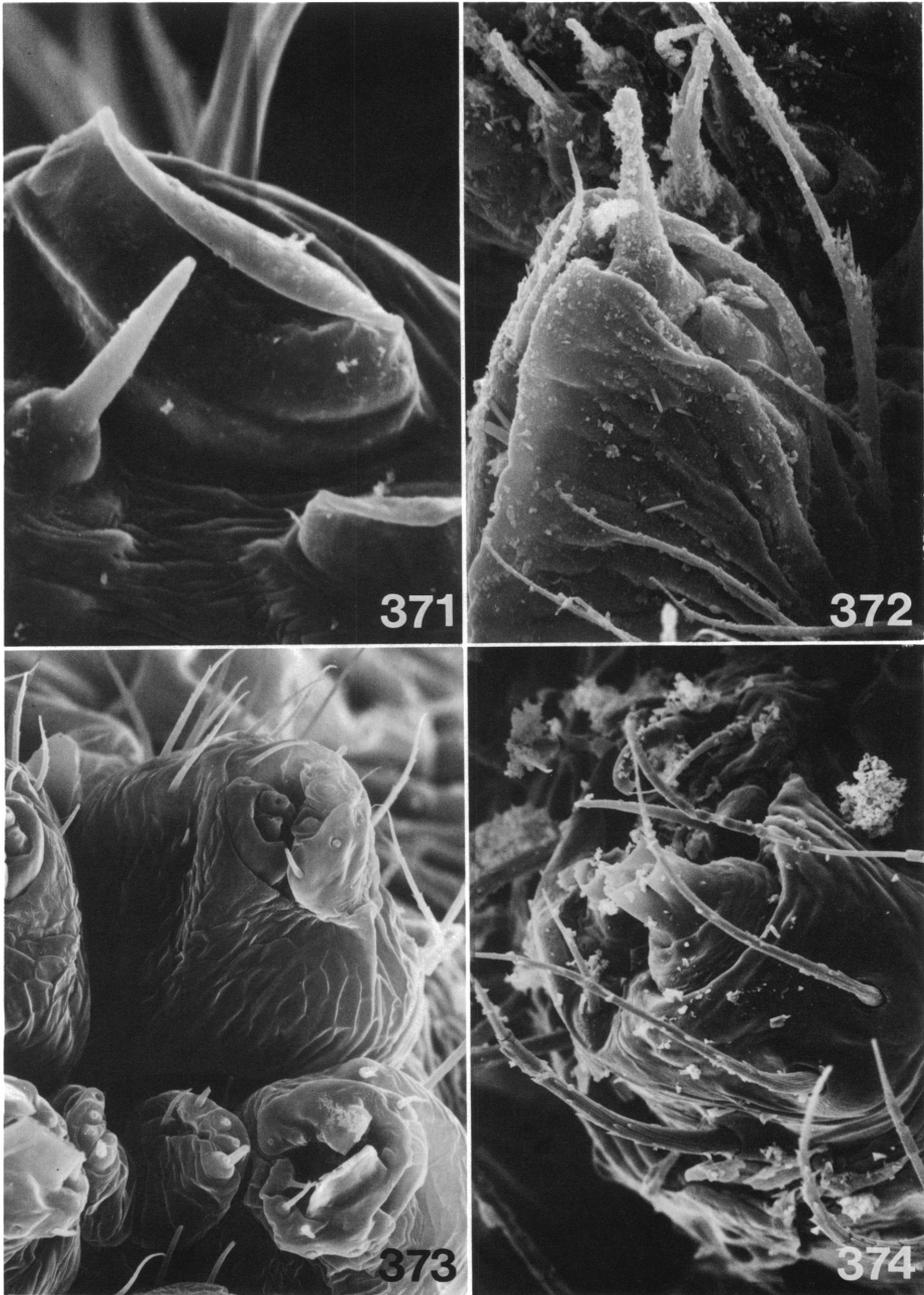
It may well be that the most characteristic feature of the family Tetragnathidae, and perhaps an autapomorph character, is the cone-shaped tibia of the male palpus with its distal rim slightly modified (but not sclerotized) to fit the cymbium ... This tibia resembles



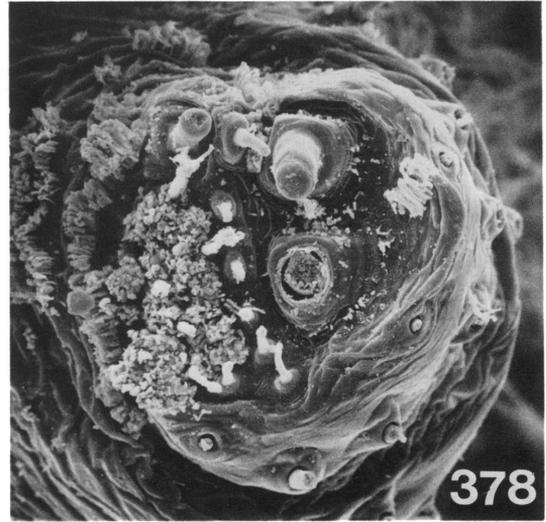
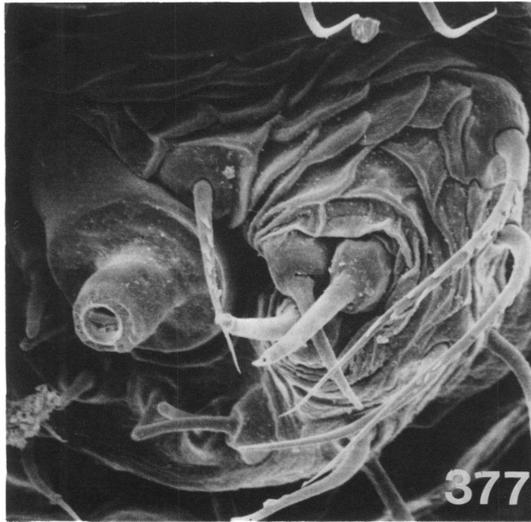
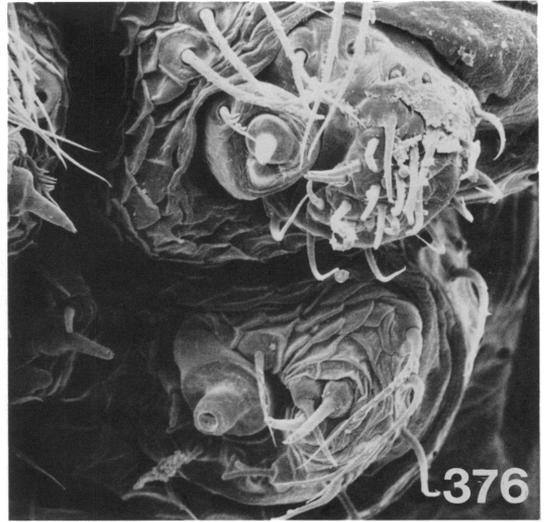
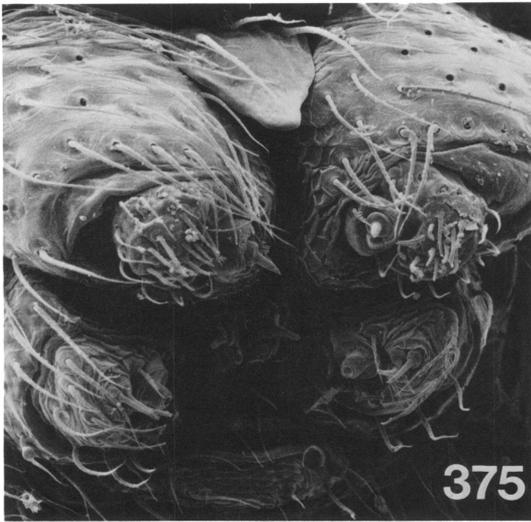
Figs. 367–370. *Achaearanea tepidariorum* (C. L. Koch), female spinnerets. 367. Left spinneret group. 368. Anterior lateral spinneret, close-up. 369. Posterior median spinneret, close-up. 370. Posterior lateral spinneret, close-up.

the palpal tibia of theridiids, except that the theridiid tibia has an entire distal rim. The cone-shaped male palpal tibia may be a synapomorphy of tetragnathids and theridiids.

The homology requires further study, but on this basis the tetragnathids could at most be the sister group of nesticids, theridiids, and



Figs. 371–374. 371. *Theridula opulenta* (Walckenaer), female posterior lateral spinneret, close-up. 372. *Nesticus cellulanus* (Olivier), female posterior median spinneret, close-up. 373. *Latrodectus variolus* (Walckenaer), second instar spinning field. 374. *Eidmanella pallida* (Emerton), female posterior lateral spinneret, close-up.

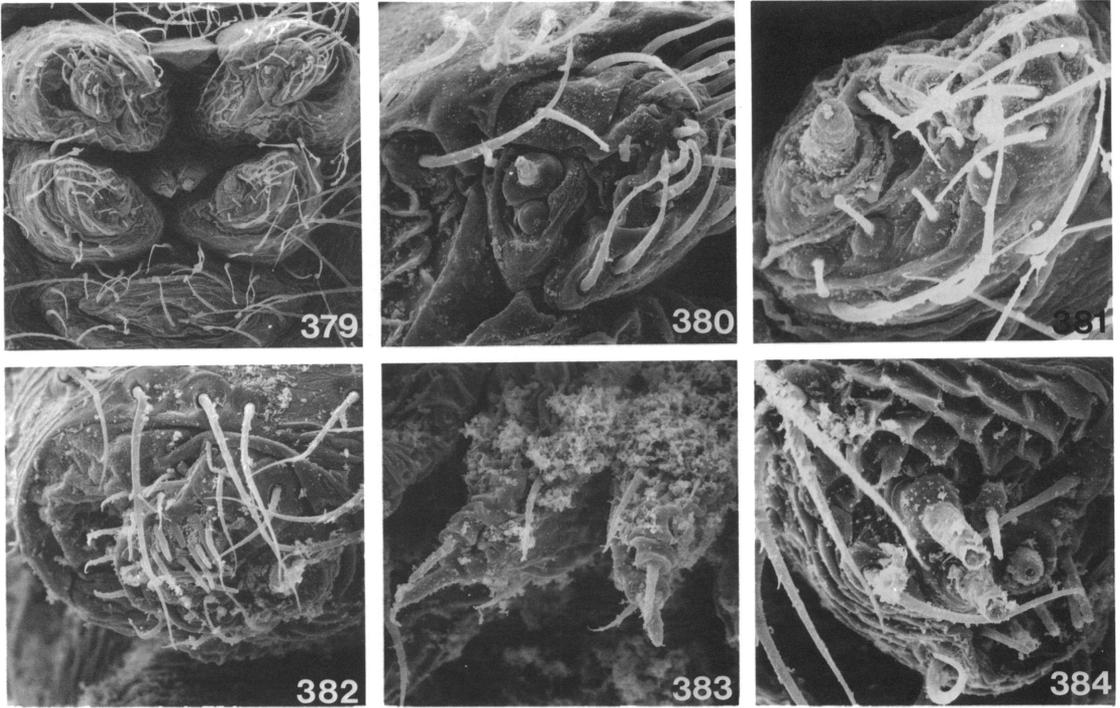


Figs. 375–378. 375–377. *Chileotaxus sans*, new species, female spinneret group, anterior and posterior lateral spinnerets, and posterior lateral spinneret, close-up. 378. *Synotaxus turbinatus* Simon, female, posterior lateral spinneret, close-up.

hadrotarsids together, rather than of theridiids alone.

Within this group of three families, nesticids are clearly the sister group of theridiids plus hadrotarsids, for two reasons. First, nesticids have a large, basal paracymbium on the male palp. Outgroup comparison with other araneoids indicates that the presence of a basal paracymbium is plesiomorphic, so hadrotarsids and theridiids are united by the shift of the paracymbium to a distal, rather

than basal, position. As was stressed by Wunderlich (1978: figs. 7, 8), the paracymbium of hadrotarsids is identical in form to that found commonly in theridiids, consisting of a hooklike protuberance on the distal margin of the alveolus that serves to anchor the bulb (via its “median apophysis”) to the alveolus (this feature was recognized by Simon, 1894, and by Levi in many of his generic revisions of theridiids). Second, at least some nesticid adults (*Gaucelmus*, see Coddington, 1989: fig.

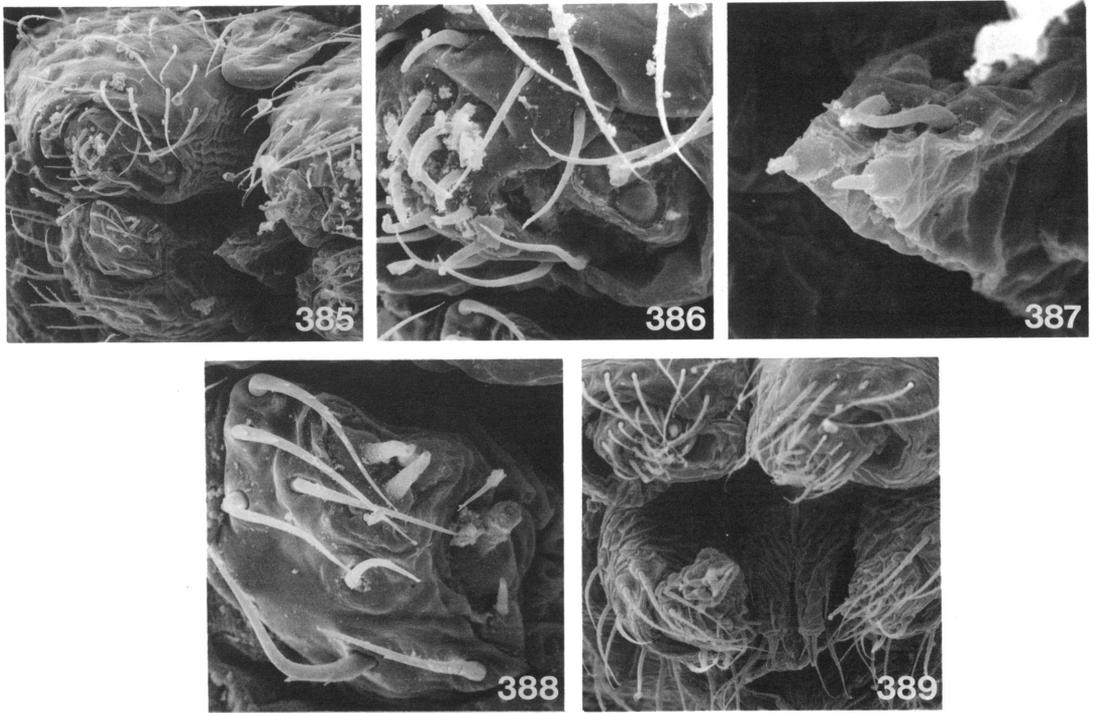


Figs. 379–384. 379–381. *Tupua bisetosa*, new species, female spinneret group, anterior lateral, and posterior lateral spinnerets. 382–384. *Nomaua nelson*, new species, female anterior lateral, posterior median, and posterior lateral spinnerets.

36; and *Nesticus*, fig. 372) retain the scar of the juvenile minor ampullate gland spigot on the posterior median spinnerets, indicating that a second functional minor ampullate gland is present during ontogeny. By out-group comparison to other araneoids, this is the primitive condition. Theridiids (e.g., figs. 353, 357, 361, 365, 369), including *Dipoena* (fig. 345), on the other hand, have lost all trace of this scar in the adult instar, and, indeed of the spigot itself in juvenile instars (e.g., second instar *Latrodectus*, fig. 373). The feature shows some homoplasy at the level of Araneoidea in that linyphiids in general lack the scar (e.g., *Frontinella*, Coddington, 1989: fig. 40), and *Synotaxus* and its relatives have very modified posterior median spinnerets, but at this point the character must still be regarded as part of the argument for grouping theridiids plus hadrotarsids exclusive of nesticids.

We have surveyed the paracymbial structure in available theridiid genera (see below),

and agree with Wunderlich that typical hadrotarsids and at least some theridiids share a seemingly synapomorphic form of paracymbium. All the theridiid paracymbia that we have been able to examine (or that are clearly described in the literature) are distally situated, with two exceptions. One is the recently described genus *Carniella* Thaler and Steinberger (1988), based on a male from Austria whose relationships those authors characterize as “ambiguous”; we suggest that the basal paracymbium is sufficient to exclude this enigmatic genus from the Theridiidae. The other exception is *Synotaxus*, which (as shown above) has a basal paracymbium that conforms instead to that shown by *Physoglenes* and similar taxa (although Levi and Levi, 1962: 63, reported that *Synotaxus* has no paracymbium, this error was corrected by Exline and Levi, 1965). We also agree with Exline and Levi (1965) that *Synotaxus* has no structure clearly identifiable as a tarsal comb, and although the single female of the type species,



Figs. 385–389. 385–388. *Mangua gunni*, new species, female spinneret group, anterior lateral, posterior median, and posterior lateral spinnerets. 389. *Pahora murihiku*, new species, female spinneret group.

Synotaxus turbinatus Simon, that has been available for examination by scanning electron microscopy is in poor condition, its posterior lateral spinnerets seem to have only normal, rather than widened, aggregate gland spigots (fig. 378), as is clearly the case for the similar genus *Chileotaxus* (figs. 375–377) as well as *Tupua* (figs. 379–381), *Pahora* (fig. 389), *Nomaua* (figs. 382–384), and *Mangua* (figs. 385–388).

Clearly *Synotaxus* and its relatives therefore fall outside the nesticid-theridiid-hadrotarsid lineage in the strict sense. However, at least two lines of evidence at present favor their placement near that lineage. First, Coddington (1986: 335) reported that *Synotaxus turbinatus* wrap attacks prey with sticky silk (observed on the night of November 20, 1981, at the Organization for Tropical Studies Biological Station at La Selva, Puerto Viejo, Heredia, Costa Rica; the behavior was essentially that described by Whitehouse, 1987 for *Argyrodes*, as *Rhomphaea* L. Koch). Al-

though the attack behavior of the related genera is unknown, the feature may be synapomorphic. Second, at least *Synotaxus* and *Chileotaxus* have an “extra” tegular apophysis, which is probably a homolog of the theridiid tegular apophysis. A third feature currently fails as a synapomorphy for the total group but, given our sparse sampling, that interpretation could easily change in the future. *Mangua*, for example, has reduced the posterior median spinning field to a single spigot (the minor ampullate), as have *Euryopis* (fig. 349) and *Hadrotarsus* (Hickman, 1942). Although homoplasious due to lack of resolution within the theridiid-hadrotarsid lineage, this feature is unique among araneoids as far as we know. At any rate, the net effect of this evidence is to place *Synotaxus* and its relatives as the sister group of the nesticid-theridiid-hadrotarsid lineage, although we certainly do not regard this placement as definitively demonstrated.

Some of these *Synotaxus* relatives have

been placed in the Linyphiidae, but those placements (including the original description of a *Mangua* in *Linyphia* by the first author) seem to have occurred largely by default. As Coddington (1986) indicated, the best evidence of linyphiid monophyly comes from the complex male palpal structure (with a distinct embolic division including a radix) found within that family, which does not occur in *Synotaxus*, *Physoglenes*, or any of their relatives described above. Representatives of these taxa have been examined by Dr. A. F. Millidge, a specialist on Linyphiidae, who concurs that these spiders are not linyphiids. We conclude that, at least for the present, it seems best to recognize the *Physoglenes*-*Syn-*

otaxus assemblage as a separate family within the Araneoidea, for which the earliest available family-group name dates from Synotaxae Simon (1894).

Evidence for the monophyly of Synotaxidae includes at least: the presence of a small, basally situated and dorsally excavated paracymbium (reduced to little more than an excavation in pahorines); the presence of a longitudinal incision of the retrolateral cymbial margin; the presence of thickened (and sometimes spiniform) dorsal macrosetae on the male palpal femur, patella, and/or tibia; and greatly elongated, spineless legs, with the first pair much the longest and all femora basally thickened.

NOTES ON THERIDIID INTERRELATIONSHIPS

The family Theridiidae constitutes one of the largest and most abundant groups of spiders, but no explicit, comprehensive hypotheses of relationship have ever been offered for its members. Simon (1894) merely separated the 72 genera he recognized into 18 tribal-level groups. Levi and Levi (1962) presented a comprehensive reassessment of the validity of previously proposed genera, but offered only a maplike diagram (p. 67) showing the distribution among those genera of eight "characters believed to be of phylogenetic importance"; of the groups defined by each of those characters, the only uncontradicted one includes just two genera.

Our recognition that *Synotaxus* has probably been misplaced in the family has required us to consider the question of generic relationships among theridiids. We offer the following comments more as stimulants to further work than as highly corroborated conclusions. None of us are specialists on theridiids; we have only a general acquaintance with the Australasian and New World genera. Hence, we have had to adopt an "exemplar" approach (with its omnipresent danger of significant undersampling) to characterizing various genera, and there are some described genera for which no specimens (particularly of males) have come to hand. This exemplar approach is especially hazardous because the

current limits of many of the larger theridiid genera are not based on any putative synapomorphies, and some genera may therefore represent artificial collections of taxa that are not each other's closest relatives.

Nevertheless, we suggest that at least two groups can be recognized among the various genera that are currently considered valid members of the Theridiidae or Hadrotarsidae. The latter family was classically construed to include only two Australasian genera (*Hadrotarsus* and *Gmogola* Keyserling) with distinctive, kidney-shaped posterior median eyes resembling those of oecobiids (see Hickman, 1942: figs. 1, 2, 20, 30, 31; Levi, 1968: fig. 2; Wunderlich, 1978: fig. 1); several similar Australian genera are known in collections and will be described elsewhere by Drs. M. Harvey and R. J. Moran. Wunderlich (1978) was the first to demonstrate affinities between typical hadrotarsids and some theridiids, but his conclusions were rejected by Baert (1984a, b), who greatly expanded the limits of the Hadrotarsidae by adding two new genera (*Guaraniella* and *Yoroa*, from South America and New Guinea, respectively) that do not share the eye modifications of *Hadrotarsus*, *Gmogola*, and their undescribed close relatives.

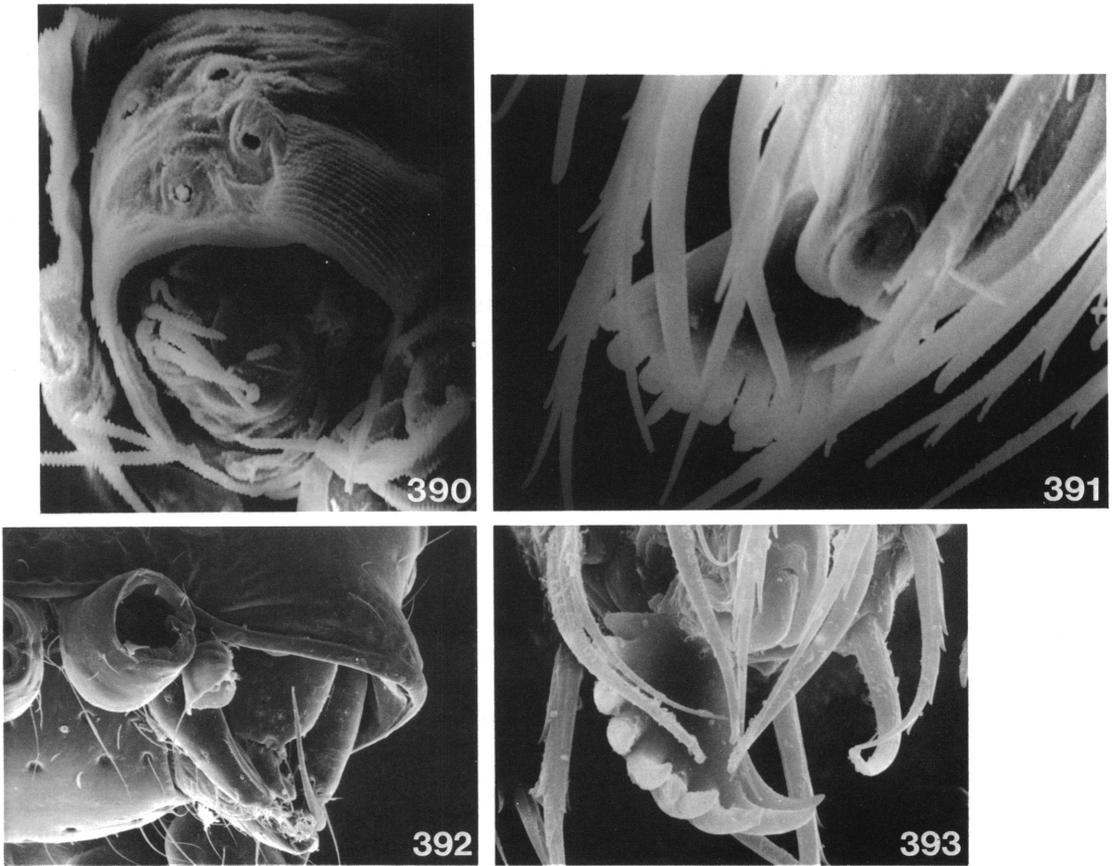
Our examination of representatives of Baert's genera indicated that many similar

taxa occur among classical theridiids, and a subsequent survey has shown that the four "hadrotarsid" genera mentioned above share with the theridiid genera *Anatea* Berland, *Audifia* Keyserling, *Dipoena*, *Dipoenata* Wunderlich, *Euryopis*, and *Lasaeola* Simon a suite of characters that seem to be synapomorphic. First, the female palpal claw is uniquely modified, being dorsoventrally flattened so that the claw teeth form a single transverse fan (figs. 391, 393); this character was noted by Hickman first (1942: figs. 17, 25) in typical hadrotarsids, and subsequently (1951: figs. 6, 12) in some of these theridiids, but was not used by him to relate the groups. The only homoplasy known to us occurs in some species of *Dipoena* (sensu Levi), where the female palpal claw is reduced or lost entirely; we know of no other spiders that have similarly modified palpal claws. Second, the cheliceral paturon is abnormally shortened, such that the distal end does not reach the tip of the palpal endites, and the fang is proportionally elongated (fig. 392; cf. Baert, 1984a: figs. 18, 25, 29, 33); the elongated fangs may play an important role in predatory behavior, as all these taxa seem to be specialist feeders on ants (and *Anatea* is an effective ant mimic as well). Third, the ventral surface of (the often swollen) tarsi I bears specialized setae with expanded tips (figs. 394–397; cf. Levi, 1968: fig. 9; Wunderlich, 1978: fig. 3). The only similar structures that come to mind occur in some members of the distantly related family Tetrablemmidae (see Shear, 1988: figs. 4, 5). Fourth, the median surfaces of the anterior lateral spinnerets bear a series of parallel ridges (figs. 343, 390) that were noted by Hickman (1942: figs. 14, 27), who regarded them as stridulatory in function, in hadrotarsids, and by Wunderlich (1978: fig. 9) in *Euryopis*. The homologous surface in nesticids (fig. 339) and other theridiids (figs. 351, 355, 359, 373) is normal cuticle. A less derived form occurs in *Euryopis funebris* (fig. 347), where the ridges are not consolidated but instead are formed by aligned plates or folds of araneoid cuticle. Here again, we are aware of homoplasy only in the distantly related family Malkaridae (Platnick and Forster, 1987: fig. 22). Finally, as was stressed by Levi and Levi (1962, and subsequently), the theridiid genera men-

tioned are anomalous in having (at least plesiomorphically) four spermathecae (females of other theridiid genera have only two spermathecae, as in most other araneoids), as also seems to be the case (again, at least plesiomorphically) for the hadrotarsid genera. We conclude, at least as a working hypothesis to be tested by detailed revisionary work, that these ten genera may represent a monophyletic group, for which the earliest available name is Hadrotarsinae, based on Hadrotarsidae Thorell (1881).

This complex of characters is so striking that we initially considered simply transferring into the Hadrotarsidae the six related genera that have traditionally been placed in the Theridiidae (along with some 14 other generic names regarded as synonyms of *Euryopis* and *Dipoena* by Levi and Levi, 1962, many of which we suspect will eventually prove to represent valid, monophyletic groups). Such a transfer might be supported by the lack of the excessive development of the aggregate spigots on the posterior lateral spinnerets found in other theridiids (compare figs. 346, 350 with 354, 362). In effect, the largest hadrotarsine spigot is generally smaller than the smallest typical theridiid spigot, and the few hadrotarsines thus far examined show substantial modification of only one aggregate gland spigot rather than both. The first transformation in this character system seems to involve enlargement of the prolateral, or ectal, aggregate spigot, with the mesal spigot remaining normal, or, at least, no larger than the prolateral. This condition appears in hadrotarsines (but note *Dipoena*, fig. 346) and nesticids. Given an enlarged prolateral spigot, in typical theridiids the mesal spigot is further modified to be grossly larger than the prolateral, although the size disparity may reverse among highly derived theridiids (e.g., *Theridula*, fig. 371).

Our survey of theridiid paracymbia, however, indicates that Wunderlich (1978) was correct in arguing that the typical hadrotarsids share a unique form of paracymbium with many theridiids, and we therefore concur that the complex represents a subgroup rather than sister group of theridiids. Although there are other araneoids (such as cyatholipids) that have a distally situated paracymbium, the hook-shaped structure found,

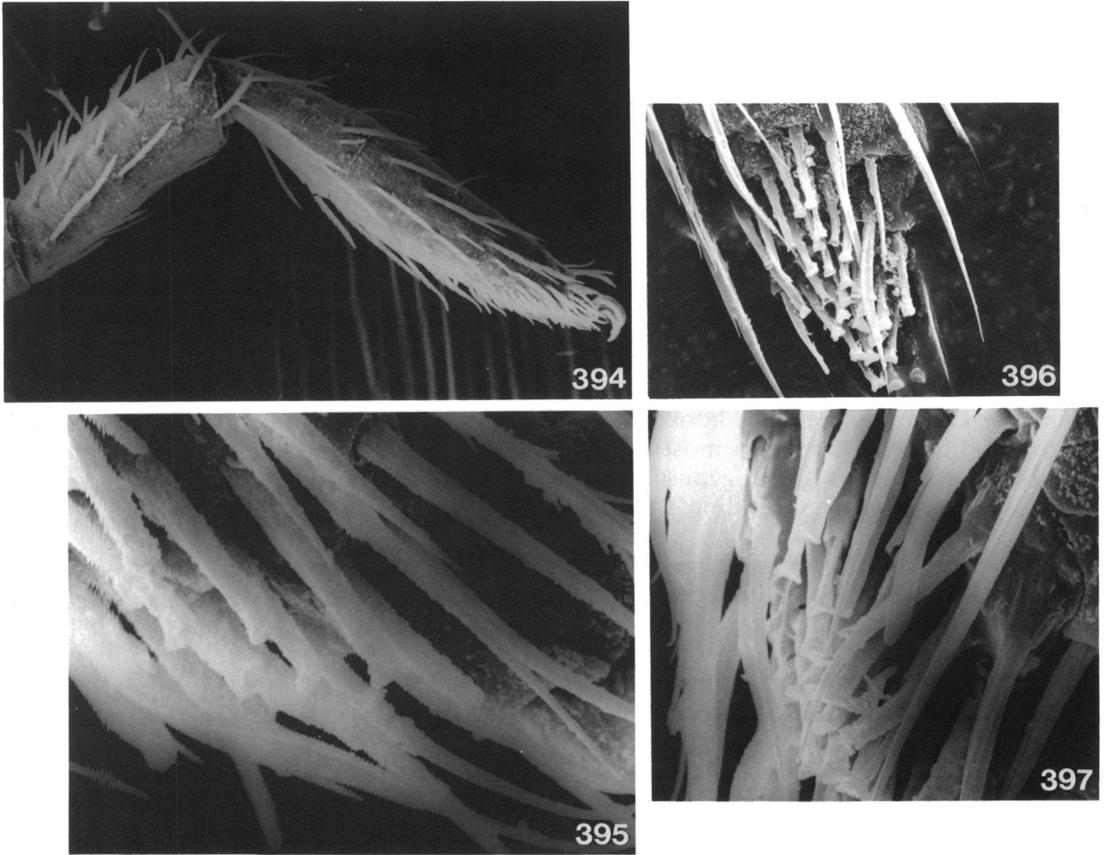


Figs. 390–393. 390. *Hadrotarsus ornatus* Hickman, female anterior spinneret, ventral view, showing median ridges. 391. *Dipoena melanogaster* (C. L. Koch), female palpal claw, ventral view. 392. *Anatea formicaria* Berland, mouthparts, lateral view. 393. Same, female palpal claw, ventral view.

for example, in *Theridion* Walckenaer is (so far as we are aware) confined to the classical theridiids and hadrotarsids.

Our survey of theridiid paracymbia has indicated, however, that some genera have a modified form of paracymbium, in which an elevated ridge originating on the alveolar margin forms a distinct hood overriding a concavity; the “median apophysis” fits into that concavity. This form of paracymbium seems to have been explicitly described only by Saaristo (1978: 112, figs. 184, 195) and Heimer (1982: 41, fig. 6), perhaps because it can only be observed in expanded palpi or those in which the bulb has been forceably removed from the cymbium. We have observed such hoodlike paracymbia in representatives of the genera *Anelosimus*, *Chro-*

siothes Simon, *Chryso* O. P.-Cambridge, *Coleosoma* O. P.-Cambridge, *Helvibis* Keyserling, *Nesticodes* Archer, *Rugathodes* Archer, *Spintharus* Hentz, *Tekellina* Levi, *Theridula*, *Thwaitesia* O. P.-Cambridge, and *Thymoites* Keyserling (but see comments about *Achaearanea* below). We know of no similar structures in other spiders, and therefore suggest that these genera may also form a monophyletic group, for which Simon’s (1894) Spinthareae is available as a family-group name (Spintharinae). One potential source of homoplasy may be that *Chrosiothes* (Coddington, personal obs.), *Spintharus* (Stowe, 1985: 23), and *Episinus* Latreille (Bristowe, 1958) seem to share a unique and derived web architecture, even though *Episinus* lacks a hoodlike paracymbium.



Figs. 394–397. 394, 395. *Hadrotarsus ornatus* Hickman, female, tibia, metatarsus, and tarsus I, lateral view, with enlargement of ventral setae on tarsus. 396. *Anatea formicaria* Berland, ventral setae on tarsus I, ventral view. 397. “*Euryopsis*” (formerly *Atkinia*) *nana* O. P.-Cambridge, ventral setae on tarsus I, ventral view.

It is not difficult to imagine how the hooded paracymbial form might have originated; in some other genera, the paracymbial hook lies almost parallel to the alveolar margin, and if the proximal side rather than the tip of the hook is used to interlock with the “median apophysis,” a simple fusion of the distal side of the hook with the alveolar margin would produce a hood instead. The paracymbium of *Thwaitesia* is of particular interest in this regard, as it has a distinct hook situated inside the concavity and under the hood; determining whether this represents an additional modification or an intermediate stage between hooked and hooded paracymbia will require an assessment of spintharine interrelationships based on other characters.

The remaining theridiid genera we have been able to examine all have a hooked paracymbium, with the exception of *Paratheridula* Levi, in which we have not been able to find a paracymbium at all (but cf. Heimer, 1982). This could represent a reduction from the situation found in the similar palp of *Theridula*, where the concavity of the paracymbial hood is anchored to the bulb not by means of a sclerotized “median apophysis” but by a unique “distal hematodocha” (Levi, 1954); if the paracymbial hood was lost together with the “distal hematodocha,” *Theridula* could be paraphyletic relative to the monotypic *Paratheridula*.

If the hooded paracymbium does prove to be synapomorphic, at least two genera rec-

ognized at present are probably polyphyletic and may thus have to be delimited. Some Chilean species attributed to *Anelosimus* by Levi (1963) differ from the type species of that genus in lacking a hooded paracymbium, and may therefore be misplaced. The name *Selkirkiella* Berland (type species *Selkirkiella alboguttata* Berland) is available for most of the Chilean species currently placed in *Anelosimus*, although *A. episinoides* Levi and *A. attritus* Nicolet are aberrant and apparently unrelated to the *alboguttata* group of Chilean species. The highly autapomorphic type species of *Achaearanea*, *A. trapezoidalis* (Taczanowski), seems to have a hooked paracymbium, but many (perhaps most) other species currently placed in that genus clearly have hooded paracymbia, including *A. fresno* Levi, *A. globosa* (Hentz), *A. porteri* (Banks), and (as correctly illustrated by Heimer, 1982: fig. 6), *A. tepidariorum* (C. L. Koch).

Outgroup comparison with nesticids and other araneoids indicates that a retrolateral position of the paracymbium is plesiomorphic within the Theridiidae. Many of the remaining theridiid genera, however, have the paracymbial hook shifted into a medial or even prolateral position (where it is often invisible in the unexpanded palp), and that shift may well be synapomorphic. If so, the shift will define a much larger group that includes the Hadrotarsinae and Spintharinae (as delimited above) as well as numerous genera near *Theridion*, and excludes only such taxa as *Craspedisia* Simon, *Enoplognatha*, *Pholcomma* Thorell, *Phoroncidia* Westwood, *Robertus* O. P.-Cambridge, *Styposis* Simon, and the enigmatic Californian species described as *Archerius mendocino* by Levi (1957). Oi (1960) subsequently suggested that *Archerius* is a synonym of *Comaroma* Bertkau (which was placed as an anapid by Wunderlich, 1986); the Californian species, at least, is not an anapid. It resembles micropholcommatids in general appearance, but has the paracymbial form we take to be plesiomorphic within the Theridiidae, namely, a simple retrodistal hook.

Levi (1961: 7), in discussing "Evolutionary Trends in the Development of Palpal Sclerites in the Spider Family Theridiidae," capitalized the problem neatly:

In the theridiid palpus we have an evolutionary series that can be read from left to right, or from right to left. I assume that the *Paratheridula* palpus is actually primitive rather than secondarily simplified, and the complexity of the *Enoplognatha* palpus is not the primitive condition. This assumption is subject to controversy.

However, Levi (1980: 369) concluded that in his earlier argument, the "transformation series of theridiid palpal structures has been read in the wrong direction," and we concur with that later view. Levi originally argued primarily from outgroup comparison with very distantly related "haplogyne" and mygalomorph spiders, but a cladistic analysis of palpal morphology and ontogeny demonstrates that the palpi of those groups are secondarily rather than primitively "simple" (Coddington, 1990). Levi also argued (1961: 7) that:

The palpi of several argiopid genera, e.g., *Tetragnatha* and *Pachygnatha*, are simple, but presence of the paracymbium and other vestiges indicates that the similarity is secondary. There are no such vestiges in the simple theridiid palpi (*Paratheridula* and *Theridula*) to indicate derivation from complex forms.

However, as indicated above, we suggest that *Theridula* does show evidence of a hooded paracymbium at the alveolar attachment of the "distal hematodocha," and that *Paratheridula* may have lost the paracymbium along with that highly specialized "distal hematodocha." Moreover, cladistic analysis of araneoid interrelationships confirms that the palpal morphology of *Tetragnatha* and *Pachygnatha* is secondarily simplified, and thus essentially no outgroup evidence supports the idea that simple theridiid palpi are primitive (Coddington, 1990).

Despite the generally specialized nature of most morphological systems in theridiids and their relatives, one structure, the colulus, does offer evidence for relationships of theridiid lineages. The plesiomorphic colulus form in araneoids is clearly a more or less prominent, fleshy, setose protuberance. Such a colulus is present in araneids, linyphiids, cyatholipids, tetragnathids (including metines), theridiosomatids, and the less derived symphytognathoid families. It is also present in the theridiid genera *Anelosimus*, *Latrodectus*, *Enoplognatha*, and *Steatoda*, as stressed by

Levi (1961), although, once again, his interpretation of the polarity of the transformation series was the opposite of that suggested by outgroup comparison. Derived states are either a reduction to two setae or the complete loss of the colulus. Other things being equal, taxa retaining this plesiomorphic character state should be near the base of their lineages, and thus one might infer that *Ane-losimus* is the sister group of the remaining theridiid genera with a hooded paracymbium.

Clearly, an immense amount of work remains to be done in resolving theridiid interrelationships, and we offer the above suggestions in hopes that they will be rigorously tested, and quickly improved upon if found wanting, by studies far more comprehensive than the context of this paper allows. On the basis of the information summarized here, however, the traditional placement of *Synotaxus* as a theridiid seems incorrect.

REFERENCES

- Baert, L.
 1984a. Mysmenidae and Hadrotarsidae from the Neotropical Guarani zoogeographical province (Paraguay and south Brazil) (Araneae). *Rev. Suisse Zool.* 91: 603–616.
 1984b. Spiders (Araneae) from Papua New Guinea. IV. Ochyroceratidae, Telemididae, Hadrotarsidae and Mysmenidae. *Indo-Malayan Zool.* 2: 225–244.
- Bonnet, P.
 1958. *Bibliographia araneorum*. Toulouse: Douladoure, 2(4): 3027–4230.
- Brignoli, P. M.
 1978. Spinnen aus Brasilien, II. Vier neue Ochyroceratidae aus Amazonas nebst Bemerkungen über andere Amerikanische Arten (Arachnida: Araneae). *Stud. Neotropical Fauna Environ.* 13: 11–21.
 1983. A catalogue of the Araneae described between 1940 and 1981. Manchester: Manchester Univ. Press, 755 pp.
- Bristowe, W. S.
 1958. *The world of spiders*. London: Collins, xiii + 304 pp.
- Carico, J. E.
 1978. Predatory behavior in *Euryopsis funebris* (Hentz) (Araneae: Theridiidae) and the evolutionary significance of web reduction. *Symp. Zool. Soc. London* 42: 51–58.
- Coddington, J.
 1986. The monophyletic origin of the orb web. *In* W. A. Shear (ed.), *Spiders: Webs, behavior, and evolution*, pp. 319–363. Stanford: Stanford Univ. Press.
 1989. Spinneret silk spigot morphology: Evidence for the monophyly of orbweaving spiders, Cyrtophorinae (Araneidae), and the group Theridiidae plus Nesticidae. *J. Arachnol.* 17: 71–95.
1990. Ontogeny and homology in the male palpus of orb weaving spiders and their potential outgroups, with comments on phylogeny (Araneoclada: Araneoidea, Deinopoidea). *Smithson. Contrib. Zool.*, no. 496.
- Dalmas, R. de
 1917. Araignées de Nouvelle Zélande. *Ann. Soc. Entomol. France* 86: 317–430.
- Davies, V. T.
 1985. Araneomorphae (in part). *Zool. Cat. Australia* 3: 49–125.
- Eberhard, W. G.
 1977. "Rectangular orb" webs of *Synotaxus* (Araneae: Theridiidae). *J. Nat. Hist.* 11: 501–507.
- Exline, H., and H. W. Levi
 1965. The spider genus *Synotaxus* (Araneae: Theridiidae). *Trans. Am. Microsc. Soc.* 84: 177–184.
- Fage, L.
 1912. Etudes sur les araignées cavernicoles. I. Révision des Ochyroceratidae (n. fam.). *Arch. Zool. Exp.*, ser. 5, 10: 97–162.
- Forster, R. R.
 1964. The Araneae and Opiliones of the subantarctic islands of New Zealand. *Pac. Insects Monogr.* 7: 58–115.
- Forster, R. R., and L. M. Forster
 1973. *New Zealand spiders: An introduction*. Auckland: Collins, 254 pp.
- Gerhardt, U., and A. Kästner
 1938. Araneae=Echte Spinnen=Webspinnen. *In* W. Kükenthal and T. Krumbach, *Handbuch der Zoologie*, 3: 393–496. Berlin: Gruyter.

- Heimer, S.
1982. Interne Arretierungsmechanismen an den Kopulationsorganen männlicher Spinnen (Arachnida, Araneae): Ein Beitrag zur Phylogenie der Araneoidea. Entomol. Abh. Staatliches Mus. Tierkunde Dresden 45: 35-64.
- Hickman, V. V.
1942. On some new Hadrotarsidae (Araneae) with notes on their internal anatomy. Pap. Proc. R. Soc. Tasmania 147-169.
1951. New Phoroncidiinae and the affinities of the New Zealand spider *Atkinsonia nana* Cambridge. Ibid., 3-24.
- Levi, H. W.
1954. The spider genus *Theridula* in North and Central America and the West Indies (Araneae: Theridiidae). Trans. Am. Microsc. Soc. 73: 331-343.
1957. The North American spider genera *Paratheridula*, *Tekellina*, *Pholcomma* and *Archerius* (Araneae: Theridiidae). Ibid., 76: 105-115.
1961. Evolutionary trends in the development of palpal sclerites in the spider family Theridiidae. J. Morphol. 108: 1-9.
1963. The American spiders of the genus *Ane-losimus* (Araneae, Theridiidae). Trans. Am. Microsc. Soc. 82: 30-48.
1968. The spider family Hadrotarsidae and the genus *Hadrotarsus*. Ibid., 87: 141-145.
1980. Orb-webs: Primitive or specialized. In J. Gruber (ed.), Proceedings of the 8th international congress of arachnology, Vienna, pp. 367-370. Vienna: H. Egerman.
1986. The Neotropical orb-weaver genera *Chrysometa* and *Homalometa* (Araneae: Tetragnathidae). Bull. Mus. Comp. Zool. 151: 91-215.
- Levi, H. W., and D. E. Randolph
1975. A key and checklist of American spiders of the family Theridiidae north of Mexico (Araneae). J. Arachnol. 3: 31-51.
- Levi, H. W., and L. L. Levi
1962. The genera of the spider family Theridiidae. Bull. Mus. Comp. Zool. 127: 1-71.
- Oi, R.
1960. Linyphiid spiders of Japan. J. Inst. Polytechnics, Osaka City Univ., ser. D, 11: 137-244.
- Petrunkevitch, A.
1928. Systema aranearum. Trans. Connecticut Acad. Arts Sci. 29: 1-270.
- Platnick, N. I., and R. R. Forster
1987. On the first American spiders of the subfamily Sternodinae (Araneae, Malakaridae). Am. Mus. Novitates 2894: 12 pp.
- Roewer, C. F.
1942. Katalog der Araneae von 1758 bis 1940, 1: 1-1040. Bremen: Budy.
- Saaristo, M. I.
1978. Spiders (Arachnida, Araneae) from the Seychelle Islands, with notes on taxonomy. Ann. Zool. Fennici 15: 99-126.
- Shear, W. A.
1988. *Brignoliella ratnapura* n. sp., and an enigmatic new structure in spiders (Araneae, Tetrablemmidae). Bull. Br. Arachnol. Soc. 7: 201-203.
- Simon, E.
1894. Histoire naturelle des araignées, 1(3): 489-760. Paris: Roret.
1904. Etude sur les arachnides du Chili recueillis en 1900, 1901 et 1902, par MM. C. Porter, Dr. Delfin, Barcey Wilson et Edwards. Ann. Soc. Entomol. Belgique 48: 83-114.
- Stowe, M.
1985. Webwatching. Orion Nat. Quart. 4: 20-27.
- Thaler, K., and K.-H. Steinberger
1988. Zwei neue Zwerg-Kugelspinnen aus Österreich (Arachnida: Aranei, Theridiidae). Rev. Suisse Zool. 95: 997-1004.
- Thorell, T.
1881. Studi sui ragni Malesi e Papuani. Part III. Ragni dell'Austro-Malesia e del Capo York, conservati nel Museo civico de storia naturale di Genova. Ann. Mus. Civico Storia Nat. Genova 17: 1-720.
- Urquhart, A. T.
1891. On new species of Araneae. Trans. New Zealand Inst. 23: 128-189.
- Whitehouse, M. E. A.
1987. "Spider eat spider": The predatory behavior of *Romphaea* sp. from New Zealand. J. Arachnol. 15: 357-364.
- Wunderlich, J.
1978. Zu Taxonomie und Synonymie der Taxa Hadrotarsidae, *Lucarachne* Bryant 1940 and *Flegia* C. L. Koch & Berendt 1854, (Arachnida: Araneida: Theridiidae). Zool. Beitr. 24: 25-31.
1986. Spinnenfauna gestern und heute: Fossile Spinnen in Bernstein und ihre heute lebenden Verwandten. Wiesbaden: Quelle & Meyer.

THIS PUBLICATION IS PRINTED ON ACID-FREE PAPER.

