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ARCHAEID SPIDERS AND THEIR
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THE LIMITS OF THE
SUPERFAMILY PALPIMANOIDEA
(ARACHNIDA, ARANEAE)

RAYMOND R. FORSTER AND NORMAN I. PLATNICK

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ABSTRACT

A comparative morphological survey of the archaeid spiders and their relatives is presented; cladistic analysis of the results supports the following taxonomic changes. The family Archaeidae Koch and Berendt is relimited to include only four genera: *Archaea* Koch and Berendt (containing six Baltic amber species and six Recent species from Madagascar), and the new genera *Austrarchaea* (type species *Archaea nodosa* Forster from Queensland; also including *Archaea hickmani* Butler from Victoria and a new species from Queensland), *Afrarchaea* (type species *Archaea godfreyi* Hewitt from South Africa and Madagascar), and *Eoarchaea* (type species *Archaea hyperoptica* Menge from Baltic amber). Other taxa previously placed in the Archaeidae are assigned to the family Mecysmaucheniidae Simon and the new families Pararchaeidae (for *Pararchaea* Forster, including seven species from New Zealand, Australia, and Tasmania) and Holarchaeidae (for *Holarchaea* Forster, including *H. novaeseelandiae* Forster from New Zealand and *Zearchaea globosa* Hickman from Tasmania). The Mecysmaucheniidae is divided into two subfamilies. The Mecysmaucheniinae contains *Mecysmauchenius* Simon from south-

ern Chile, adjacent Argentina, and the Falkland Islands; also including *M. gertschi* Zapfe from central Chile and 14 new species from Chile and the Juan Fernandez Islands) and the new genera *Mecysmauchenioides* (type species *Mecysmauchenius nordenskjoldi* Tullgren from Chile), *Semysmauchenius* (type species *S. antillanca*, new species, from Chile), *Mesarchaea* (type species *M. bellavista*, new species, from Chile), and *Aotearoa* (type species *Zearchaea magna* Forster from New Zealand). The new subfamily Zearchaeinae contains *Zearchaea* Wilton (type species *Z. clypeata* Wilton from New Zealand; also including *Z. fiordensis* Forster from New Zealand) and the new genus *Chilarchaea* (type species *C. quellon*, new species, from Chile). Recent hypotheses by Lehtinen and Levi assigning these taxa to two different superfamilies are rejected. The four families are judged instead to constitute a monophyletic group with its closest relatives among the superfamily Palpimanoidea, which is expanded to include them as well as (in suggested sister-group sequence) the Tetricellidae and Micropholcommatidae, the traditional palpimanoids (Huttoniidae, Stenochiliidae, and Palpimanidae), and the Mimetidae.

INTRODUCTION

Despite their rarity in collections, the true archaeids are widely known by araneologists. Not only are they among the most bizarre of all spiders structurally, with an enormously elevated cephalic area and grossly developed chelicerae (figs. 1, 2), but the history of their discovery is equally extraordinary: they were described first as fossils in Baltic amber, and found alive only a quarter century later. Since the first record of an extant species from Madagascar in 1881, various genera and species have been added to the Archaeidae, mainly from the southern hemisphere; these taxa have in common a markedly raised pars cephalica accompanied by elongated chelicerae. By this gradual process of accretion, the limits of the family became so extended that some recent authors have concluded that the Archaeidae is not a monophyletic group but merely an aggregation of a number of different lineages held together by parallel modifications of the carapace. These authors have even removed some of the taxa from the su-

perfamily Araneoidea, where the archaeids traditionally have been placed.

The present study is an attempt to investigate the interrelationships among the various archaeid taxa and other spiders by means of a cladistic analysis of the results of a comparative morphological survey. We conclude that apart from the obvious misplacement, by some workers, of the araneoid genus *Landana*, the spiders which have in the past been assigned to the Archaeidae do, in fact, form a natural group. However, we argue that the differences among these taxa, and their interrelationships, are best reflected in a classification recognizing four separate families. Furthermore, with an enhanced understanding of the significance of a number of the characters possessed by these spiders, we have reconsidered their generally accepted association with the araneoids and conclude that their true relationship lies instead with the palpimanoid families. We also suggest that three other families conventionally placed in

the Araneoidea (the Tetracellidae, Micropholcommatidae, and Mimetidae) are palpmorphs as well.

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We are indebted to the Eppley Foundation for Research for its generous funding of the second author's 1981 fieldwork in Chile, which was instrumental in our recognition of the surprising diversity of the Chilean mecysmaucheniid fauna, and to the Scientific Distribution Committee of the Golden Kiwi Lottery Fund for its continuing support of the first author's work.

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TAXONOMIC HISTORY

The family Archaeidae was established by Koch and Berendt, in a posthumously published paper (1854), for three new species from Baltic amber which they placed in the newly erected genus *Archaea*. In a footnote in the same paper, Menge (who edited their original manuscript for publication) added three new species from the same source. These six fossil species remained the only known representatives of the family until O. P.-Cambridge (1881) described (as a theridiid) the first living species, *Eriauchenius workmani*, from Madagascar.

Simon soon placed two additional species in the family, for each of which he established a new genus. He first (1883) described *Landana petiti* from the Congo, suggesting that both *Landana* and *Eriauchenius* are close to *Archaea*, and then (1884) described *Mecysmauchenius segmentatus* from Chile. Later (1895), having had the opportunity to ob-

serve *Landana* in the field and to examine more material, he concluded that he was mistaken in his original views on the relationships of *Landana* and transferred that genus to his group Meteae in the Tetragnathinae. The two remaining genera, *Archaea* (which he considered a senior synonym of *Eriauchenius*) and *Mecysmauchenius*, he placed in separate groups—the Archaeae and Mecysmauchenieae.

Subsequently, Petrunkevitch (1928) listed these two taxa as subfamilies and in a later paper (Petrunkevitch, 1939) argued strongly for the reinstatement of *Landana* within the Archaeidae. Wilton (1946) established a new genus, *Zearchaea*, for a minute spider from New Zealand which he placed in the Archaeidae, stating that it possessed characters intermediate between *Archaea* and *Mecysmauchenius*. In that paper he apparently accepted Petrunkevitch's views on the inclu-

sion of *Landana* within the Archaeidae but pointed out that *Landana* differs more from the other three genera (*Archaea*, *Mecysmauchenius*, and *Zearchaea*) than they do from each other, and he proposed that the subfamily Mecysmaucheniinae be dropped.

Shortly after this, Forster (1949) described three new "archaeids" from New Zealand, two of which were placed in *Zearchaea* and the third in *Archaea*. After additional material, including specimens from Australia, became available, he (1955) transferred one of these species from *Zearchaea* to the newly established genus *Pararchaea* (along with two newly described species, one from Australia and the other from New Zealand). In that same paper, the new genus *Holarchaea* was established for the New Zealand species originally described in *Archaea*.

Lehtinen (1967) rejected Petrunkevitch's suggestion that *Landana* be returned to the Archaeidae and also stated that the Recent species of *Archaea* could not be considered congeneric with the fossil species, which he believed probably represented at least two genera. He gave no evidence in support of these views, however, either with regard to the generic allocation of the fossil species or their relationship with the Recent taxa. He suggested that *Archaea* and *Eriauchenius* be retained in the family Archaeidae, which he felt might also include *Holarchaea*, but that *Mecysmauchenius*, *Pararchaea*, and *Zearchaea* should be placed in a separate family Mecysmaucheniidae. Lehtinen also maintained that these two families are not related and should be placed in entirely different branches within the classification he proposed. The Archaeidae he placed in the Araneioidea, within his branch Araneides, whereas the Mecysmaucheniidae were located in his branch Zodariides. His placement of the Mecysmaucheniidae in the superfamily Zodarioidea was apparently influenced by the reduction of the posterior and median spinnerets (which actually occurs in only two of the three genera he grouped together), but again no direct justification for this action was given. Lehtinen did specify (as usual, without supporting characters) that his group Mecysmaucheniidae "seems to be related to Palpimanidae, and possibly also to the genus *Plectophanes*" (1967, p. 290).

Legendre (1970a, 1977) concurred with Lehtinen on the misplacement of *Landana* in the Archaeidae but rejected his dismemberment of the family. Although Lehtinen (1975) nonetheless maintained his diphyly argument, he seems subsequently to have abandoned it, for Lehtinen (1980, p. 495) includes the self-contradictory statement that "Mecysmaucheniidae and Archaeidae are not closely related to each other, but they seem to belong to the same main group of spider evolution, in which there are no other recent families."

Brignoli (1980a) noted that although *Mecysmauchenius* has haplogyne genitalia, those of *Pararchaea* and *Holarchaea* are much more complex; elsewhere (1980b) he commented on the cheliceral and vulval similarities between *Mecysmauchenius* and *Palpimanus*. However, he concluded only (1980a, p. 31) that "Il y a donc la possibilité que le taxon 'Archaeidae' soit polyphylétique."

Assessments as mutually contradictory as those of Lehtinen have recently been published by Levi, who (1981) supported the conclusions of Lehtinen and Legendre regarding the placement of *Landana*, although he synonymized the genus with *Dolichognatha* (on the phenetic grounds that "there are intermediates") and placed it in the Tetragnathinae. In that paper, he argued that the Archaeidae must be excluded from the Araneioidea, citing (p. 280) as "the most important difference" the fact that "the median spinnerets are minute, and the posterior spinnerets are much smaller than the anterior ones" and also mentioning that, unlike araneoids, the single metatarsal trichobothrium is distally situated. In this (1981) paper, Levi specifically included in the Archaeidae the genera *Archaea* and *Zearchaea*, and, judging by his references to Forster's (1955) illustrations, intended to include at least *Pararchaea* as well. Despite these comments on excluding archaeids from the Araneioidea, Levi (1982) published a new classification of spiders in which the genera *Archaea* and *Holarchaea* are placed in the Archaeidae and retained in the Araneioidea (*Archaea* was erroneously characterized as having no posterior spiracles; the New Zealand *Holarchaea* was also erroneously cited as Australian). The three genera *Mecysmauchenius*, *Zearchaea*, and

Pararchaea he placed, as the *Mecysmaucheniiidae*, in the *Palpimanoidea*; the first two genera were erroneously characterized as having an epigynum and the last was erroneously claimed to have an apophysis on the palpal tibia (Levi's statement that fewer than 10 species are known is also false).

The only other recent contribution relevant to the generic and higher classification of these spiders is by Heimer and Nentwig (1982); others papers in which further species have been described within established genera are considered below, as each genus is discussed. Heimer and Nentwig attempted to

present a cladogram of araneoid families, but several of their groupings are not supported by any putative synapomorphies. They repeat the association, traditional since the time of Simon (1895), of the archaeids with the "araneoid" family *Mimetidae*, but provide no synapomorphies for that grouping. As it is impossible to determine, from their discussion, which genera (other than *Arachaea*) they include in the family, it is difficult to compare their conclusions to those of Lehtinen, Legendre, Brignoli, or Levi, or to our own.

THE ARCHAEIDS AND THEIR RELATIVES

In the account below, we restrict the family *Archaeidae* to 17 species, all of which have been placed in the genus *Arachaea* at one time or another, but which we distribute into four genera. The type species of two of these genera are Baltic amber fossils, although one also includes living species. The genera *Mecysmauchenius* and *Zearchaea* (along with five new genera) are assigned to the *Mecysmaucheniiidae*. *Pararchaea* and *Holarchaea* each become the type genus for a separate family. These four families are considered to form a group within the superfamily *Palpimanoidea*.

Landana, as already indicated by Simon (1895), Lehtinen (1967), and Levi (1981), is a true araneoid, as indicated by the form of both the male and female reproductive organs, and the fact that they construct an orb-web snare of viscid silk. More to the point, for our purposes, is that the genus lacks all the characters considered below (fig. 394) to be synapomorphic for the archaeids and their close relatives. Despite the detailed comparative study of *Landana* and *Arachaea* presented by Petrunkevitch (1939), he produced no credible supporting evidence for his proposal to relocate *Landana* in the *Archaeidae*.

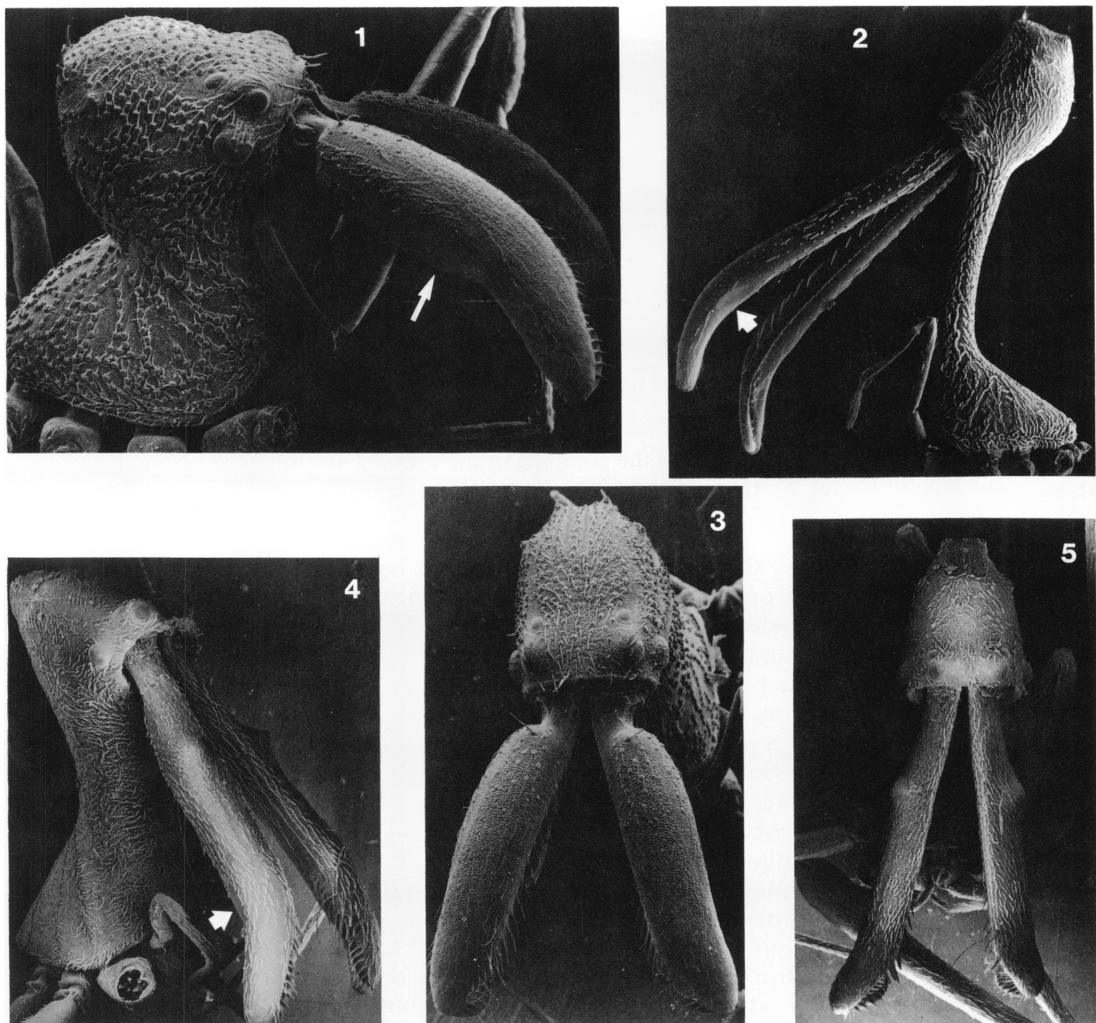
All measurements presented below are in millimeters; abbreviations for eyes are standard for the *Araneae*.

ARCHAEIDAE KOCH AND BERENDT

Archaeidae Koch and Berendt, 1854, pp. 5, 19 (type genus *Arachaea* Koch and Berendt).

DIAGNOSIS: True archaeids can be distinguished from all other spiders by the combined presence of peg teeth on the cheliceral promargin and an abdomen-petiole stridulatory system. The three Recent genera are also easily recognized by the greatly elevated *pars cephalica* and by their unique respiratory system of anterior booklungs and two posterior spiracles, situated well in advance of the spinnerets and each leading to a single tracheal tube.

DESCRIPTION: Small to medium-sized ecribellate, haplogyne, araneomorph spiders. Eight subequal eyes, in two rows; laterals contiguous, widely separated from medians; AME and PME each more widely separated than pairs are from each other (figs. 6–8). Carapace with *pars cephalica* raised high above *pars thoracica*, often constricted between head and thorax to form a distinct neck (figs. 1–5); *pars thoracica* (except in *Eoarchaea*) closely covered with small tubercles each bearing a single procumbent seta (figs. 9–12). Anterior margin of carapace sloping steeply down in front of eyes, around each side of chelicerae, usually meeting in midline so that chelicerae project out from oval foramen; foramen containing small triangular sclerite ventrally between chelicerae (at least in Recent genera). Chelicerae long, slender; fang relatively short, rarely more than one-fifth length of paturon; fang furrow weakly developed or lacking, flanked along promargin with distinctive peg teeth (modified setae)

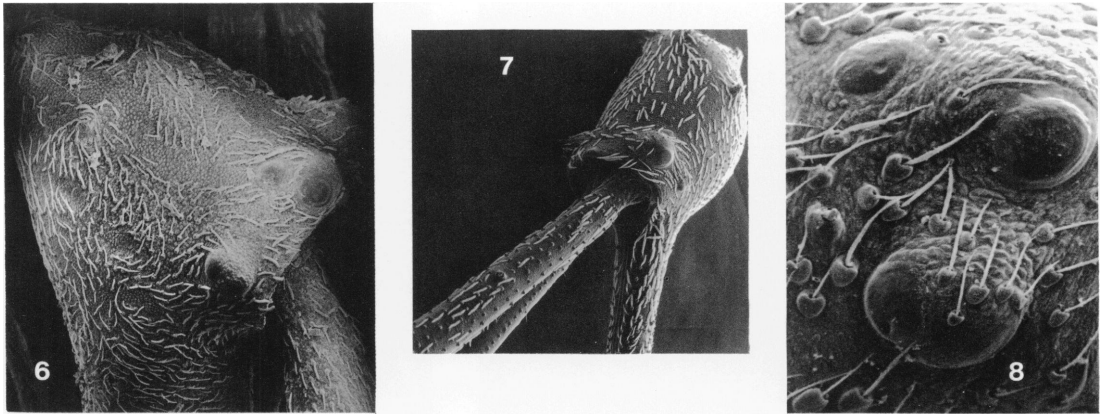


FIGS. 1-5. Archaeidae: carapace and chelicerae; arrows indicate the position of the cheliceral stridulatory ridges. 1, 3. *Afrarchaea godfreyi* (Hewitt). 2. *Archaea gracilicollis* Millot. 4, 5. *Austrarchaea nodosa* (Forster).

extending back down ventral surface of paturon (figs. 34-39), retromargin usually with conical true teeth; cheliceral gland opening from prominent lobe situated on distal retromargin of furrow, near fang tip. Poison gland endocephalic, at least in *Archaea workmani* (Petrunkevitch, 1939). Outer surface of chelicerae with stridulatory ridges in oval patch (fig. 29), apparently activated by contact with group of serrate bristles (figs. 32, 33) on metatarsus III (Millot, 1948). Endites directed across triangular labium; serrula weakly developed in some genera, strongly developed

in others (*Austrarchaea*), as single row of teeth (fig. 31). Labrum prominent, bearing paired lateral protuberances (fig. 30) as in mecsymaucheniiids. Sternum always distinctly longer than wide, with lateral margins produced between coxae, in some species linked to carapace by sclerotized strips; posterior margin always broadly obtuse; coxae IV contiguous or nearly so.

Abdomen ellipsoid or subtriangular in outline; in some species with mounds or tubercles on dorsal surface; cuticle relatively thick, almost coriaceous, often ridged laterally, es-



FIGS. 6–8. Archaeidae: head, showing the grouping of the eyes. 6. *Austrarchaea nodosa* (Forster). 7. *Archaea gracilicollis* Millot. 8. *Afrarchaea godfreyi* (Hewitt).

pecially when abdomen is shrunken (fossil specimens often show strong longitudinal ridging, particularly down sides, possibly an artifact emphasized by shrinkage); scuta rarely present on dorsal surface (in male *Austrarchaea*), but epigastric region sometimes thickened, with small plates present in front of epigastric furrow; anterior surface with stridulatory file (pick on dorsal surface of petiole; Legendre, 1970b). Abdominal hairs either filiform or spatulate but uniform for each species; finely plumose and adpressed in all species examined. Six spinnerets, posteriorly placed; anteriors largest, usually contiguous; posteriors slender, two-segmented, with medians situated between them, forming transverse row. Colulus never strongly developed, usually indicated by few hairs, absent in some species. Female genitalia with anterior and posterior elements in at least some genera; anterior portion consisting entirely of secretory plate (*Archaea*, *Afrarchaea*) or modified to form receptacula (*Austrarchaea*); posterior element, when present, consisting of single median membranous sac completely enclosed in secretory tissue which discharges into sac through numerous pores.

Legs long, slender, evenly clothed with smooth or plumose adpressed hairs, without spines; first pair always markedly longer, stouter than others, with patella conspicuously long; all genera (except perhaps *Eoarchaea*) with one or two rows of long, distally

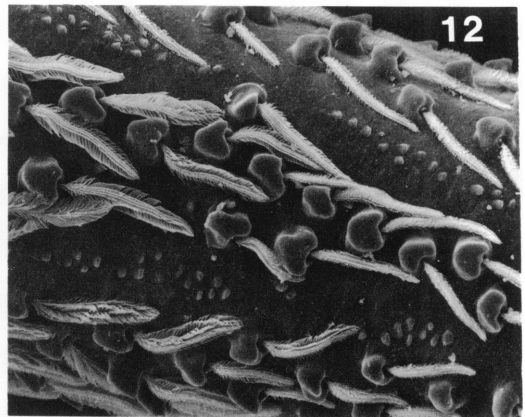
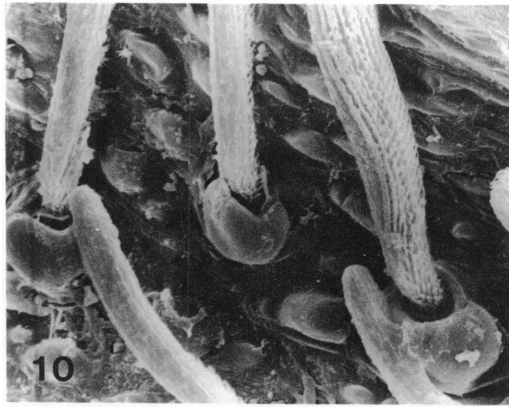
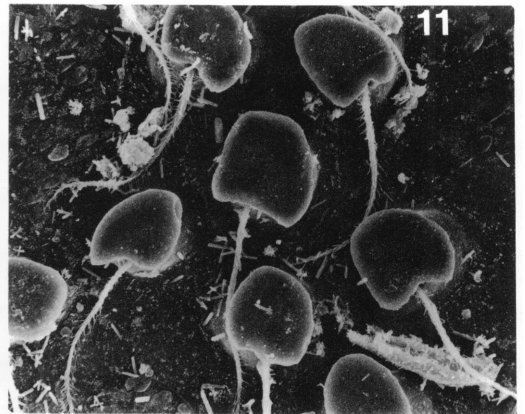
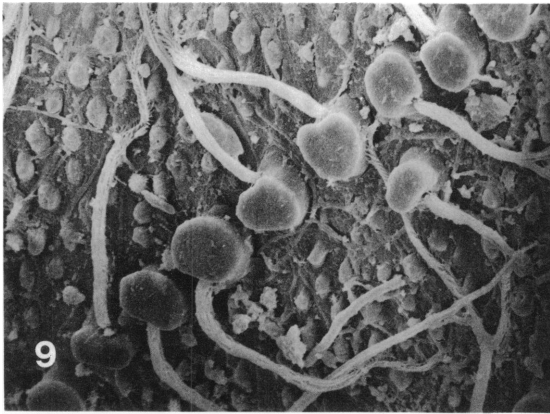
spatulate, hairs on tibia and metatarsus I (figs. 24, 25) similar in form to scopula hairs of Huttoniidae, Stenochilidae, and Palpimaniidae. Tarsi with small ring of unsclerotized cuticle near base; three claws set on short but distinct sclerotized onychium (fig. 23). Single trichobothrium present on each metatarsus, few (usually two) on tibiae, none on tarsi; bothria with transversely ridged proximal hood (figs. 18–20, 49). Tarsal organ capsulate (fig. 21). Female palp sometimes with slender tarsal claw (fig. 26), may be reduced or absent. Male palp with no accessory processes on proximal segments; cymbium small; bulb pyriform or subpyriform, attached at base of cymbium; in at least some species, bulb divided by transverse groove as in mecysmaucheniids; distal portion with processes additional to embolus; embolus generally inconspicuous, tubular in some species, spini-form in others, only rarely in form of long filiform process (*Austrarchaea*).

Heart with three pairs of ostia. Respiratory system consisting of anterior pair of booklungs, atria of which are linked by transverse duct, and two minute spiracles well in advance of spinnerets, each of which leads into single slender tracheal tube.

INCLUDED GENERA: *Archaea*, *Austrarchaea*, *Afrarchaea*, *Eoarchaea*.

DISTRIBUTION: Recent: Madagascar, South Africa, eastern Australia; fossil: Baltic amber.

DISCUSSION: The archaeids are a compact

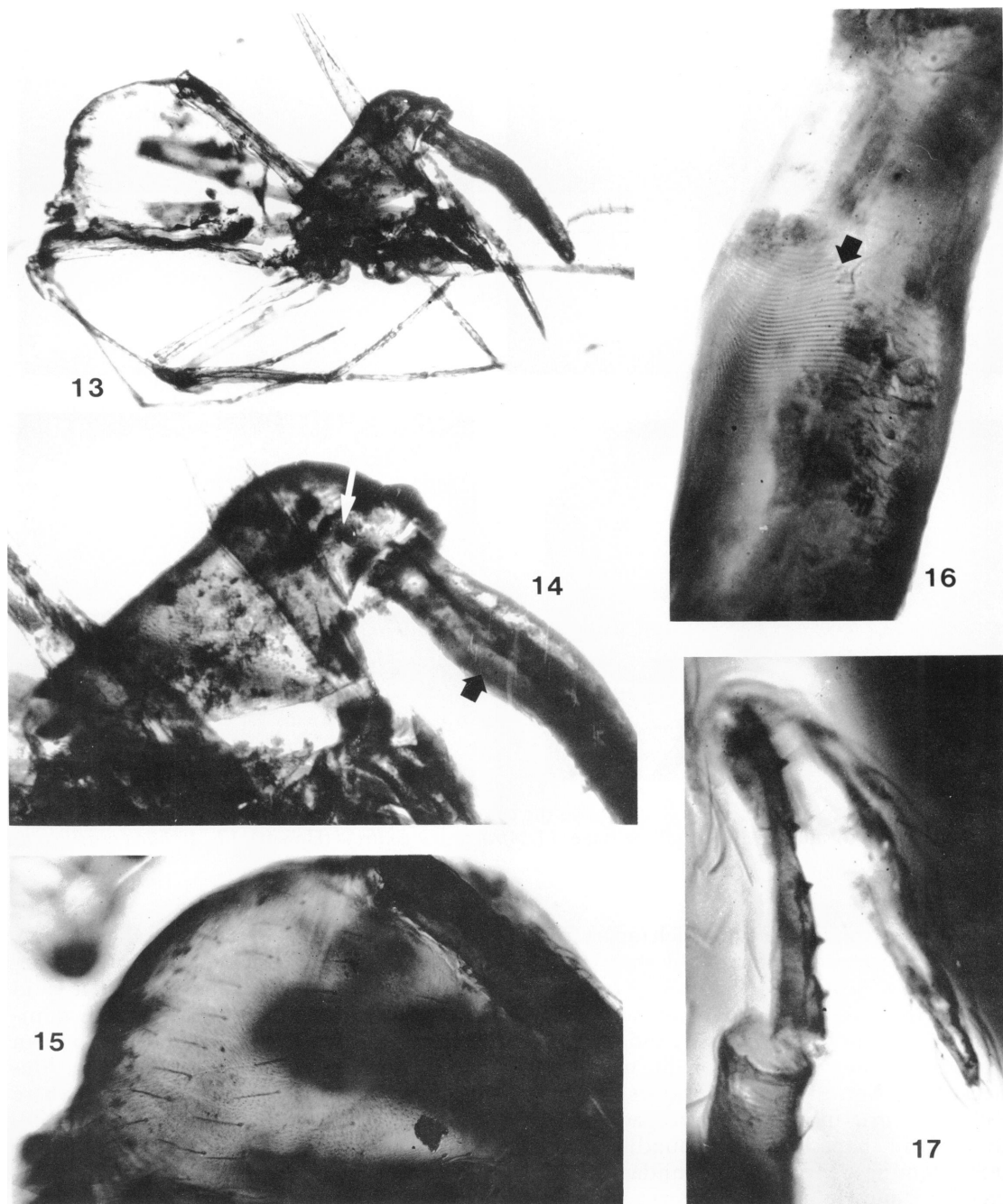


FIGS. 9–12. Archaeidae: setose pustules on the carapace. 9, 10. *Austrarchaea nodosa* (Forster); 10 is an enlargement to show the finely ciliate setae. 11. *Afrarchaea godfreyi* (Hewitt). 12. *Archaea gracilicollis* Millot.

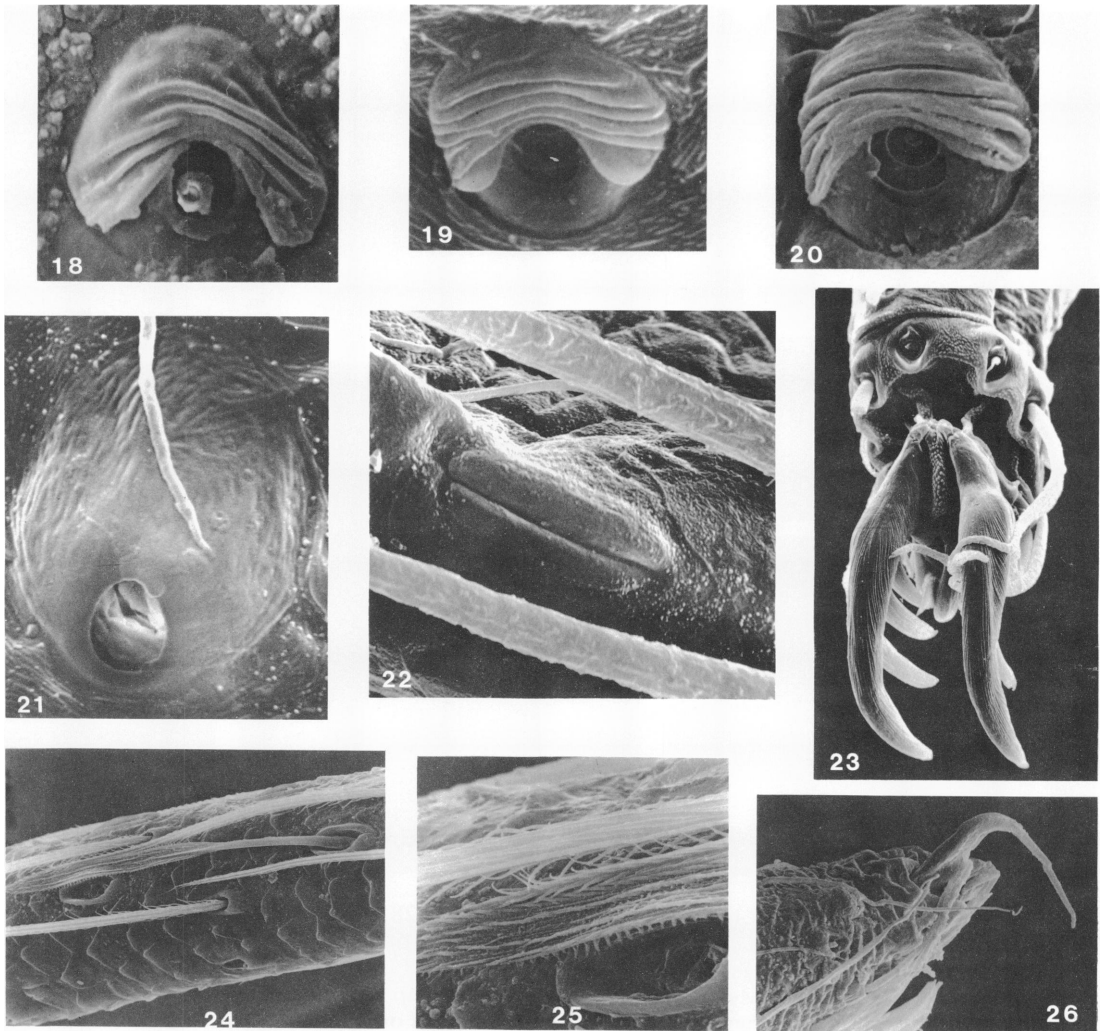
and easily recognized group which (apart from *Eoarchaea*) are characterized by the extraordinary modification of the carapace, where the head is raised high above the thorax, emphasized to varying degrees by the constriction of the intermediate portion to form a neck. However, this character does not hold for *Eoarchaea*, in which the carapace is little different in shape from that found in the related families Mecysmaucheniidae, Pararchaeidae, and Holarchaeidae, suggesting that the carapace form in that genus is plesiomorphic for the true archaeids. The raised caput is in itself not unique to these four families, being found in both sexes in a number of other families (see discussion under Cladistic Analysis below), but the extension of the anterior margin of the carapace below the

base of the chelicerae to meet in the midline, and the concomitant elongation of the chelicerae, is unique and appears to be a valid synapomorphy which links these four families. The ontogeny of this modification can be readily followed in the Archaeidae, Mecysmaucheniidae, and Pararchaeidae, where in early instars the inner margins of the extended, sclerotized carapace are widely separated below the chelicerae and bridged by thin unsclerotized cuticle. In later instars this gap is reduced or even obliterated and the opposed plates are distinguished by at most an inconspicuous median longitudinal groove.

Apart from the striking modifications of the carapace, which do generally show some degree of stability at the generic level, the non-genital characters are surprisingly sta-



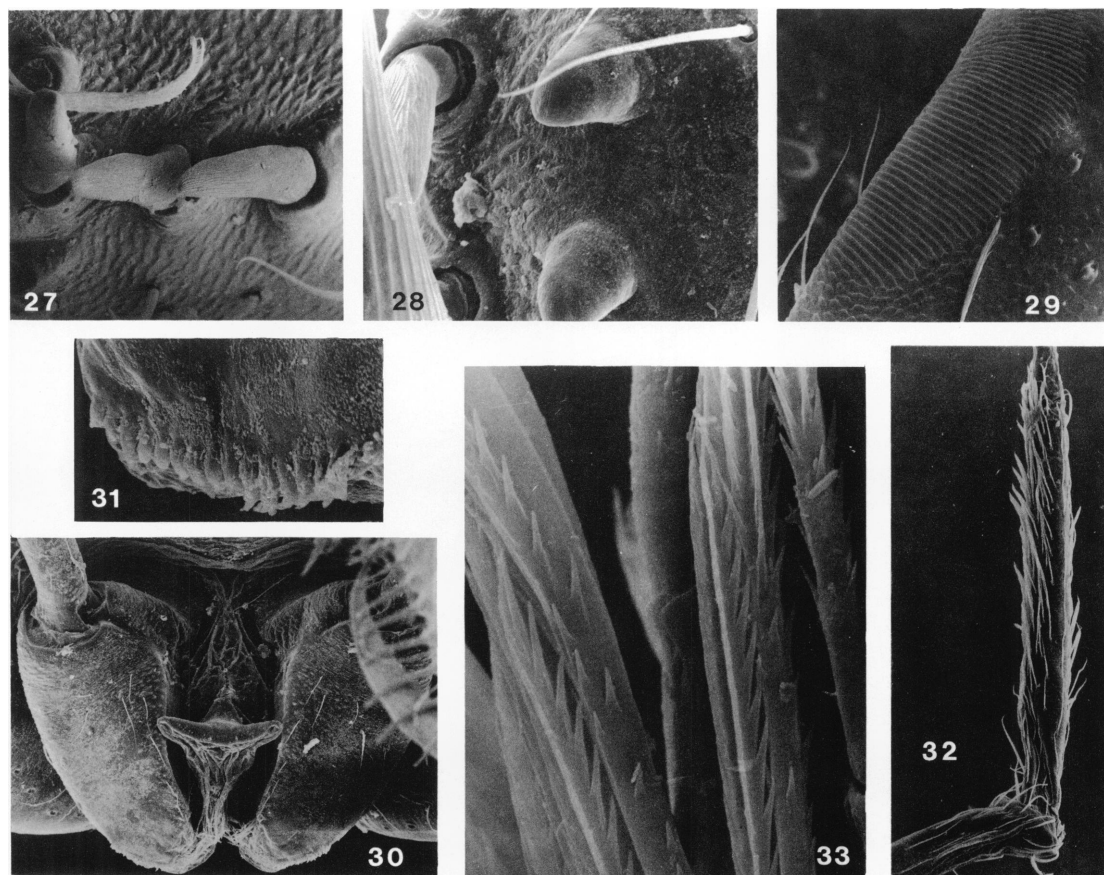
FIGS. 13-17. Archaeidae: *Eoarchaea hyperoptica* (Menge), photographed from the specimen described by Petrunkevitch (1950). 13. Lateral view. 14. Carapace; white arrow indicates the contiguous lateral eyes, black arrow the position of the stridulatory ridges. 15. Portion of abdomen, showing the relatively large hairs arranged in regular rows. 16. Portion of chelicera; arrow indicates the stridulatory ridges. 17. Pedipalp; note the row of denticles along the ventral surface of the femur.



FIGS. 18–26. Archaeidae. 18, 26. *Afrarchaea godfreyi* (Hewitt). 19. *Austrarchaea nodosa* (Forster). 20, 24, 25. *Archaea gracilicollis* Millot. 21–23. *Archaea vadoni* Millot. 18–20. Bothria. 21. Tarsal organ. 22. Tarsal slit sense organ. 23. Distal portion of tarsus I; note the strong teeth on the ventral surface of the superior claws and the poorly developed onychium. 24, 25. Portion of retrolateral surface of metatarsus I, showing the spatulate hairs arising from elongated pits, and an enlargement of one spatulate hair. 26. Vestigial palpal claw.

ble at the family level. The chelicerae all follow the same pattern, varying only in the presence and number of true teeth and the shape of the cheliceral gland mound, the position of the stridulatory file, and the development of the lateral lobes. There is also a common form of sternum, which varies only in the width of the plate. Whereas the relative

length and width of the setae may vary, the microstructure is constant. Similarly, there is little variation in the form of the trichobothria or of the capsulate tarsal organ. The presence of spatulate hairs on the tibiae and metatarsi of the first pair of legs has been confirmed in all genera except the fossil *Eoarchaea*, and again the microstructure of these hairs is



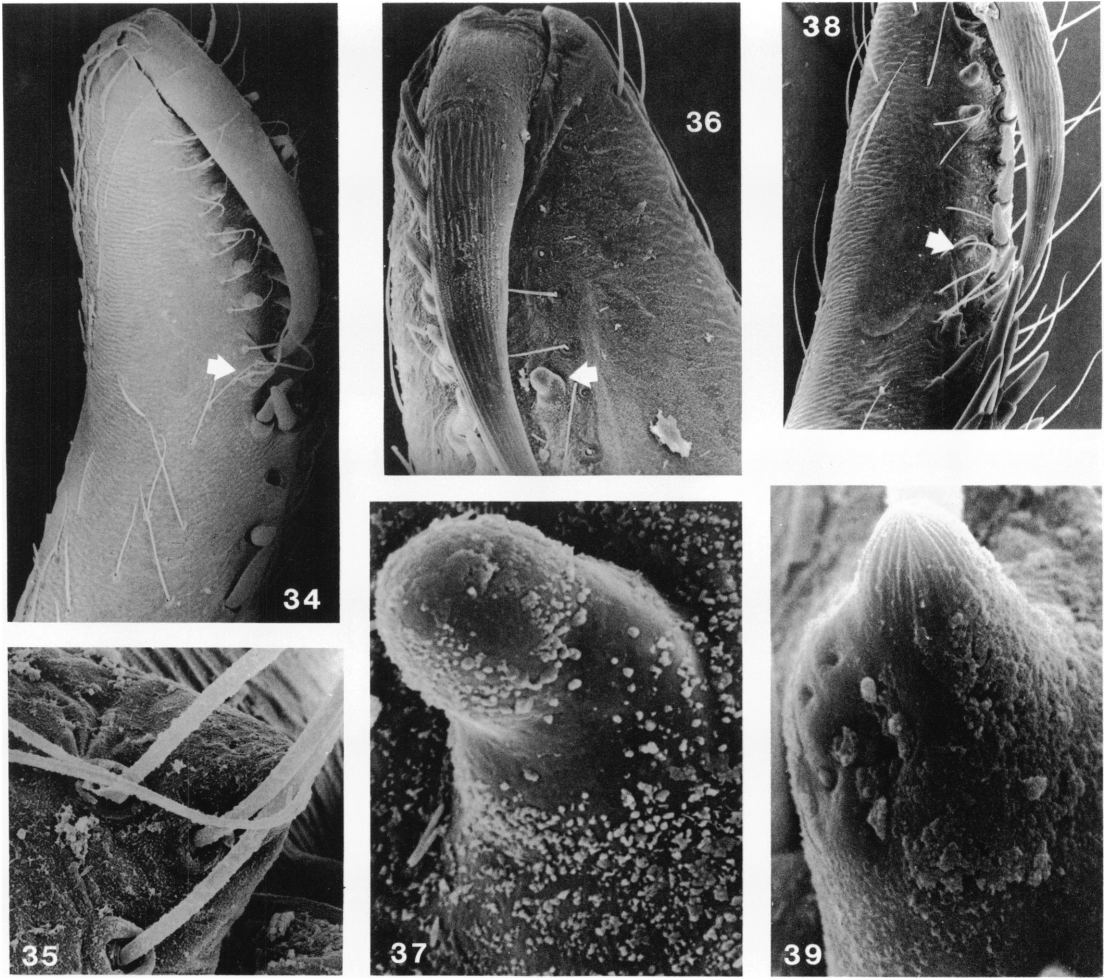
FIGS. 27–33. Archaeidae. 27. *Austrarchaea nodosa* (Forster). 28, 29. *Archaea gracilicollis* Millot. 30–33. *Afrarchaea godfreyi* (Hewitt). 27. Peg teeth on cheliceral promargin. 28. True teeth on cheliceral retromargin. 29. Stridulatory ridges on chelicera. 30. Endites and labrum, showing paired lateral labral protuberances. 31. Serrula. 32. Metatarsus III, showing the group of serrate hairs on the distal half of the ventral surface. 33. Enlargement of some of the serrate hairs on metatarsus III.

identical in all species examined. All genera appear to have the stridulatory ridges on the outer surface of the chelicerae and a group of serrate hairs on the third metatarsus in addition to the abdomen-petiole stridulatory system.

The respiratory system is similar in all living genera and probably also in the fossil *Eoarchaea*. The anterior pair of booklungs are not modified and their atria are connected by a transverse duct, but the respiratory structures associated with the third abdominal segment are unique within the labidognath spiders. The paired spiracles are small, widely separated, and situated well in advance of the spinnerets, more or less in the

position where the ancestral booklungs would have been placed. Each spiracle leads to a single narrow tracheal tube (Platnick and Forster, 1982, fig. 16).

We have divergent assessments of these respiratory peculiarities. The first author sees no reason to suggest that the simple tube which leads from each spiracle is a relict of a more extensive tracheal system; rather the structure seems to be a vestige of an original booklung which never passed through the transformation stages which would have led to such a more extensive system. The obvious conclusion is that the archaeid respiratory system is only slightly removed from the primitive quadripulmonate stage. The only

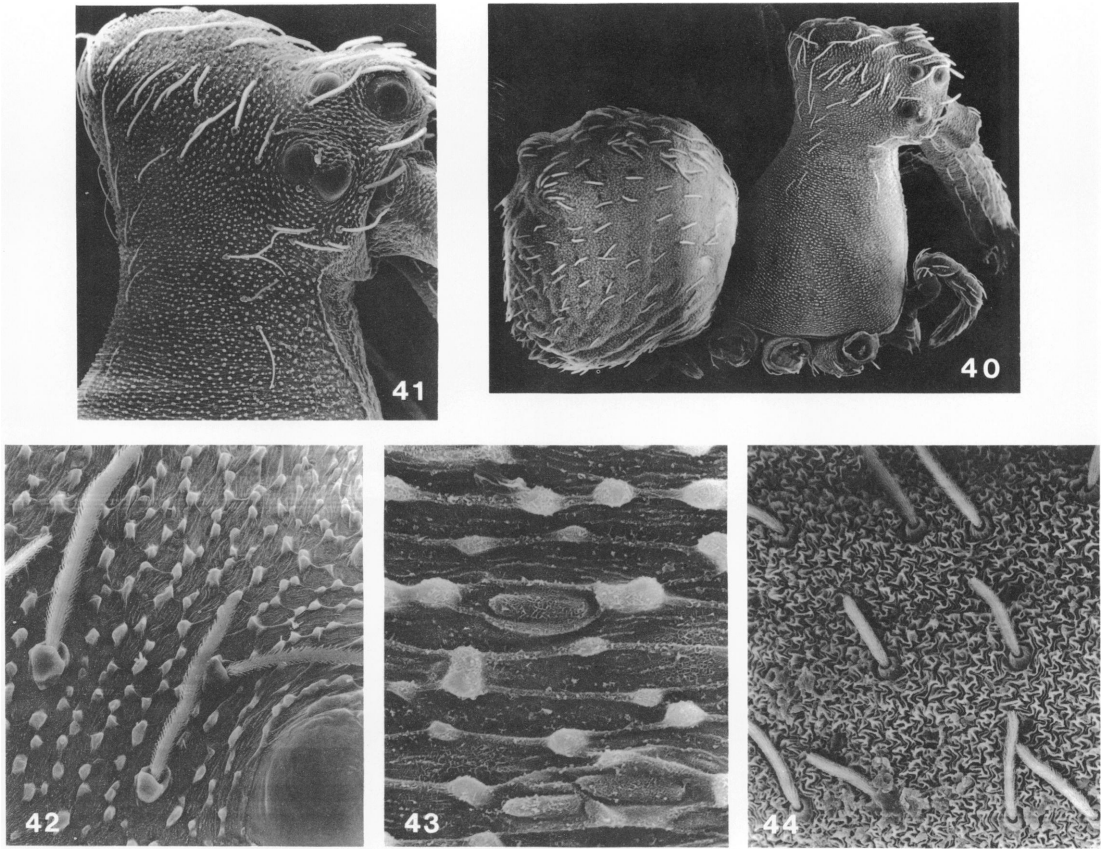


FIGS. 34–39. Archaeidae: chelicerae and cheliceral gland mounds. 34, 35. *Austrarchaea nodosa* (Forster). 36, 37. *Afrarchaea godfreyi* (Hewitt). 38, 39. *Archaea gracilicollis* Millot.

comparable organization is found in the mygalomorph *Micromygale* (Platnick and Forster, 1982) where because all the possible immediate ancestral species are in fact quadripulmonate this interpretation is the only one possible. There is no reason to doubt that the developments in the two groups are parallelisms which have each been derived in the same manner. If this is so, then it is evident that the immediate ancestor of the Archaeidae was quadripulmonate, and if the monophyly of the families associated in this paper is accepted then this must be so for the Palpimanoidea as a whole. This interpretation does not necessarily set the superfamily

far apart from other haplogyne families. It could be found, as the evolutionary development of the respiratory system becomes better known, that many of the major groups of labidognath spiders also have been derived from separate quadripulmonate ancestors.

The second author regards this hypothesis as unparsimonious, in that it would require independent transformations of plesiomorphic booklungs into tracheae in every branch on the cladogram of spiders between the Thaididae and the Archaeidae (i.e., at least eight times, and probably many more). A much more parsimonious solution is to regard the archaeid structure as an autapomorph



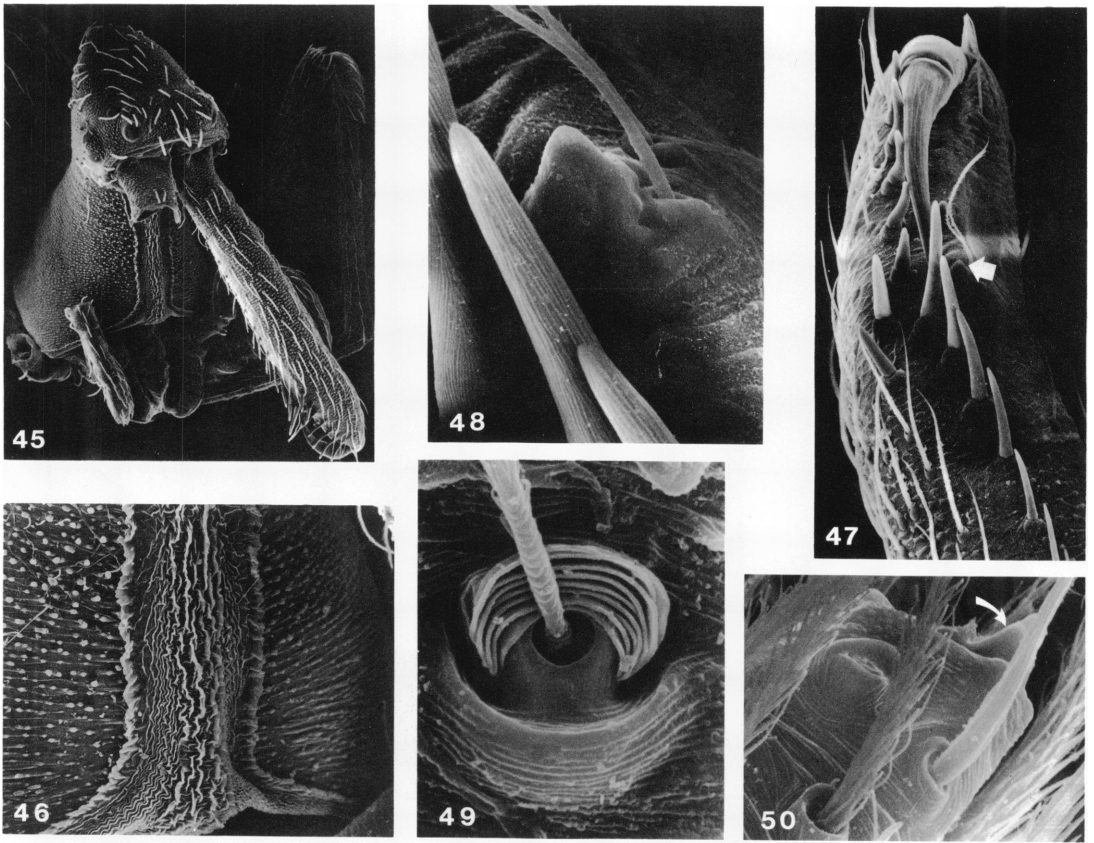
FIGS. 40–44. Archæidae: *Austrarchaea hickmani* (Butler), juvenile female (probably two molts from maturity) collected near Sydney, Australia. 40. Lateral view, showing the shape of the carapace and abdomen; note the paucity of setose tubercles. 41. Head, showing the placement of the eyes and the absence of “horns.” 42. Cuticle surface in ocular area. 43. Cuticle surface on “neck”; note the presence of two forms of denticles—the oval denticles are present in rows which correspond to the setose tubercles found in other species and may be the precursors or remnants of those structures. 44. Surface of abdomen.

morphic modification of the type of tracheal system found in the Huttoniidae, where two separate spiracles open from the sides of a single median slit (fig. 330).

The male palpal bulb in the archæids is always complex, in the sense that a number of secondary processes are present in association with the embolus. The embolus itself is often inconspicuous and, when distinct, is usually tubular rather than spinous. This organization appears to be the plesiomorphic condition for the family, and is probably so for the Palpimanoidea as a whole. The presence of a strongly developed embolus in association with the loss of the secondary structures to produce a “simple” organ is a

derivation commonly found in other haplogyne palpimanoid families, but one which has not occurred in the Archæidae.

The female internal genitalia show extraordinary diversity at the generic level, when compared with all other haplogyne families. It is probable that the primary reliance on bursal storage found in *Archæa* and *Afrarchæa*, where there is a prominent secretory plate situated on the anterior face of the bursal cavity, is the primitive organization. There is some doubt whether in these genera this structure may also be associated with a posterior receptaculum. Nevertheless in *Austrarchæa*, where the anterior secretory plate has been replaced by a number of distinct

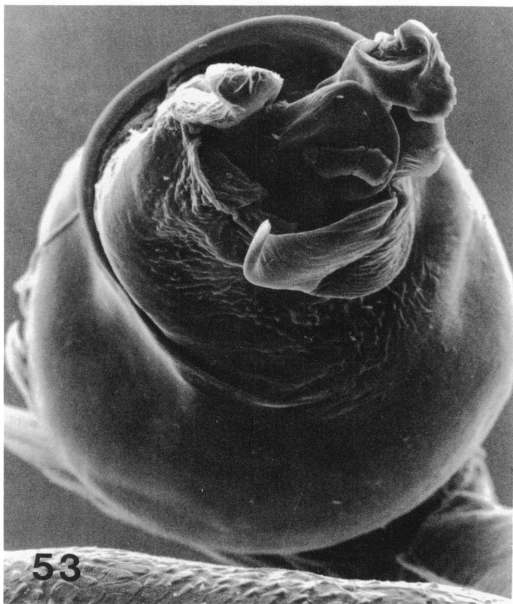
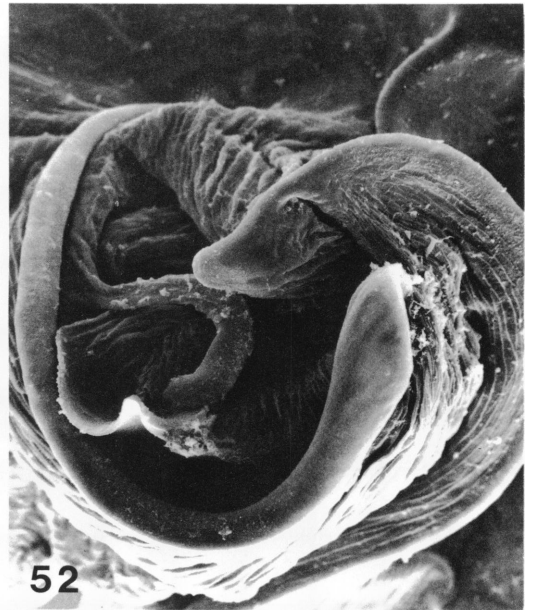
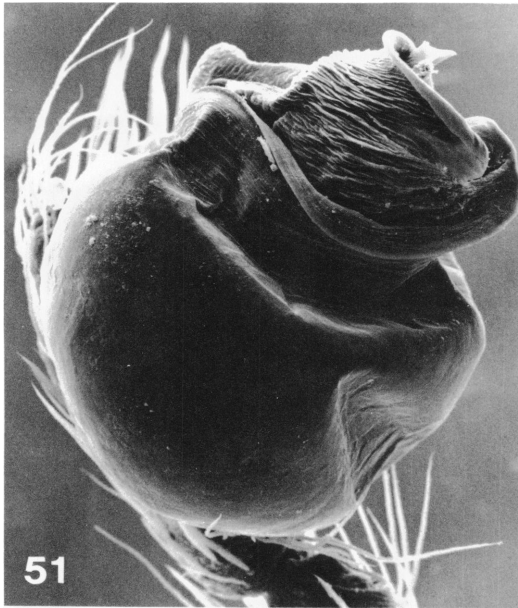


FIGS. 45–50. Archaeidae: *Austrarchaea hickmani* (Butler), juvenile female. 45. Anterior view of carapace with right chelicera removed to show the suture below the head. 46. Enlargement of that suture, showing the separated margins of the carapace linked by membranous cuticle. 47. Ventral view of chelicera; arrow indicates the gland mound. 48. Cheliceral gland mound. 49. Trichobothrium. 50. Tip of palpal tarsus; arrow indicates the vestigial claw.

receptacula, the posterior receptaculum is very strongly developed. The secondary development of a posterior receptaculum is of rare occurrence in the haplogyne families and is not found in any other palpimanoid group.

NATURAL HISTORY: Apart from the Madagascar species of *Archaea*, few natural history observations have been made on these spiders. Although Simon may have considered that the archaeids were araneophages when he associated them with the Mimetidae, the first positive suggestion that this might be so probably stems from Millot's (1948) comment that *Archaea workmani* had been seen in the field with a young spider of another species in its jaws. The suggestion that the archaeids are obligate araneophages

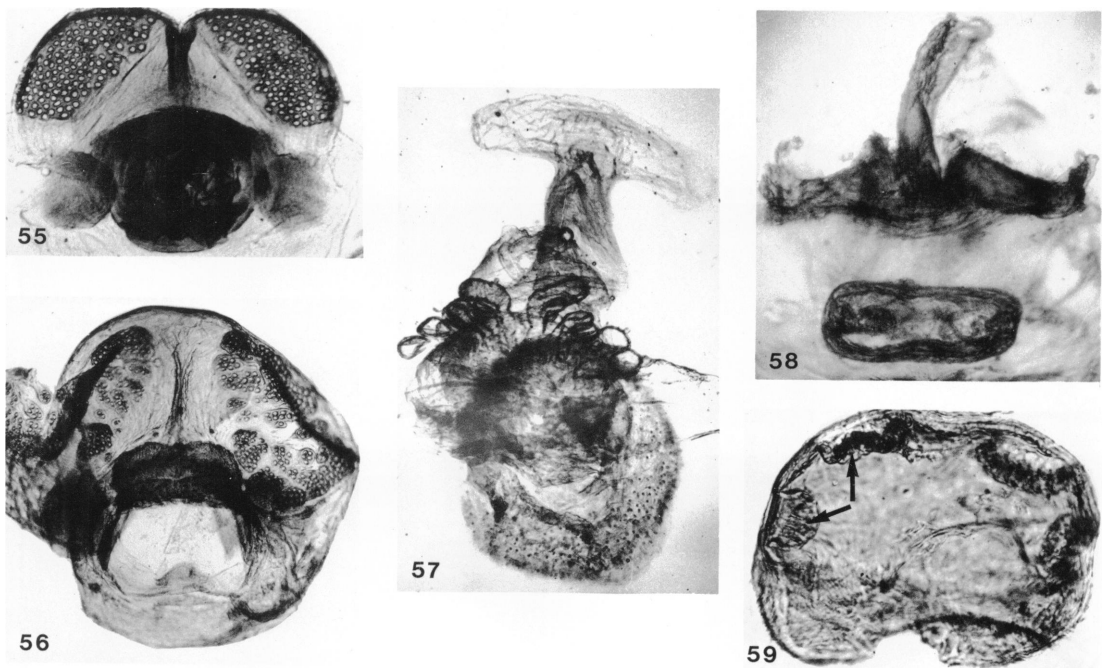
is now firmly supported, however, by the observations and experiments recorded by Legendre (1961) on four separate species of *Archaea*. Legendre found that (in captivity) only spiders would actually be consumed by these spiders and that other potential prey such as collembola, flies, and ants, which were commonly found in the moss and lichens where the spiders lived, were rejected. During prey capture the most striking feature noted was the mobility of the chelicerae, which the spider is able to move sideways as well as elevate. Perhaps the most interesting observation noted, however, was the spiders' ability to carry prey transfixated to one chelicera (held out at right angles from the head) while the other chelicera remains at rest. This maneu-



FIGS. 51–54. Archaeidae: male palp. 51, 52. *Archaea workmani* (O. P.-Cambridge). 53, 54. *Afrarchaea godfreyi* (Hewitt).

verability of the chelicerae is probably also a characteristic of the related families Mecysmaucheniidae, Pararchaeidae, and Holarchaeidae, which have a similar cheliceral organization, but there is no available evidence to support any suggestion that these spiders

are also araneophages. In the mimetids, by contrast, the structural modifications which, on behavioral grounds, appear to be of importance in capturing other spiders are the elongation of the anterior legs and their unique spination.



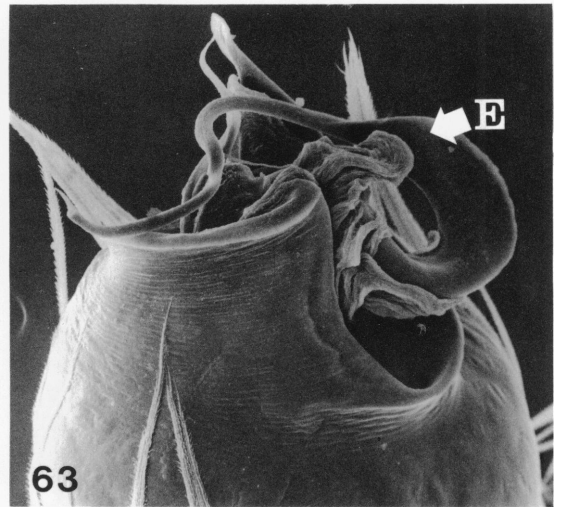
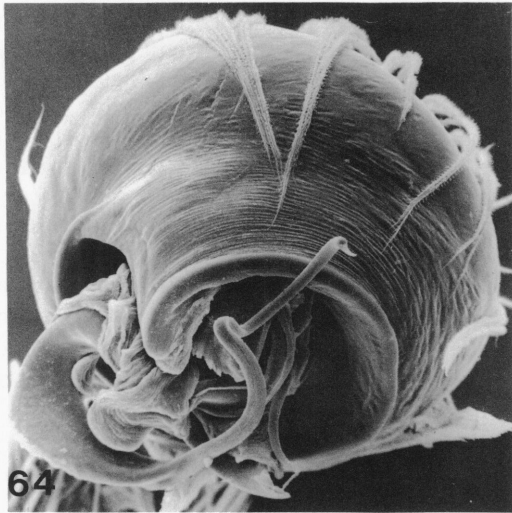
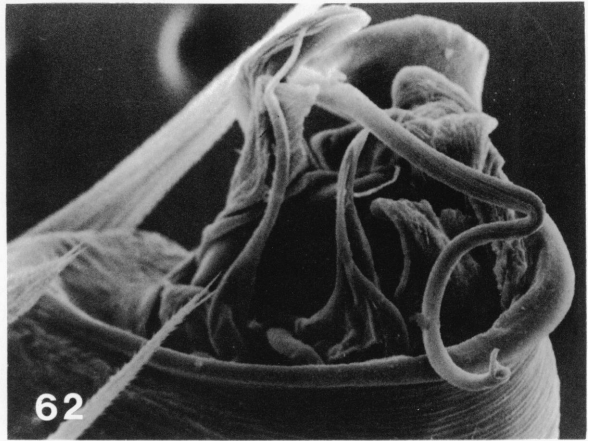
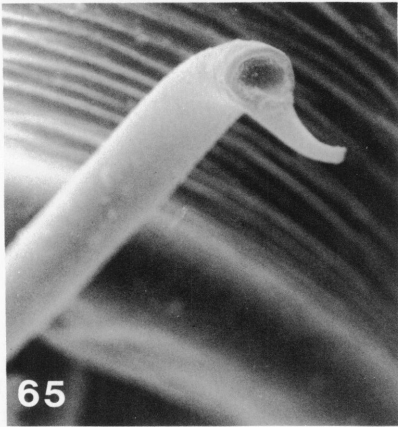
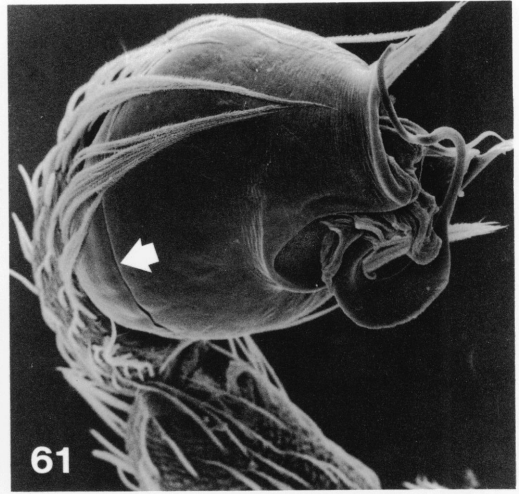
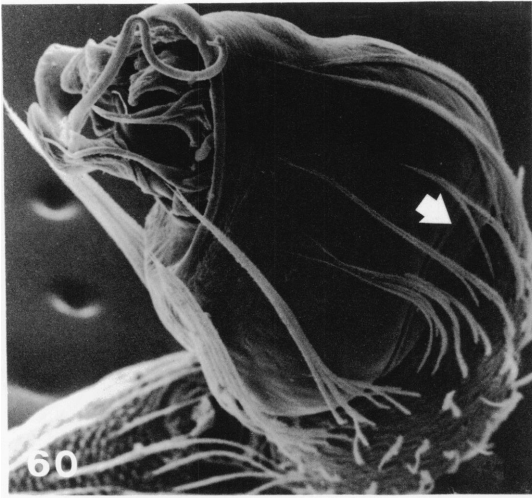
FIGS. 55–59. Archaeidae: female genitalia. 55. *Archaea vadoni* Millot. 56. *Archaea gracilicollis* Millot. 57. *Austrarchaea nodosa* (Forster). 58, 59. *Afrarchaea godfreyi* (Hewitt), posterior view, and ventral view of posterior secretory plate; arrows indicate two of the four secretory pore pouches.

All the recorded observations suggest that the archaeids are free-moving hunters that do not construct a snare or (apparently) use a retreat. Whereas the Madagascar species of *Archaea* are commonly found on shrubs and foliage (Legendre, 1970a), *Afrarchaea* is seemingly cryptozoic, being found in litter and under stones on the forest floor (Legendre, 1966, 1975). Dr. Valerie Davies reports (personal commun.) that *Austrarchaea* is found in moss and on tree trunks in forests, where specimens are often collected at night.

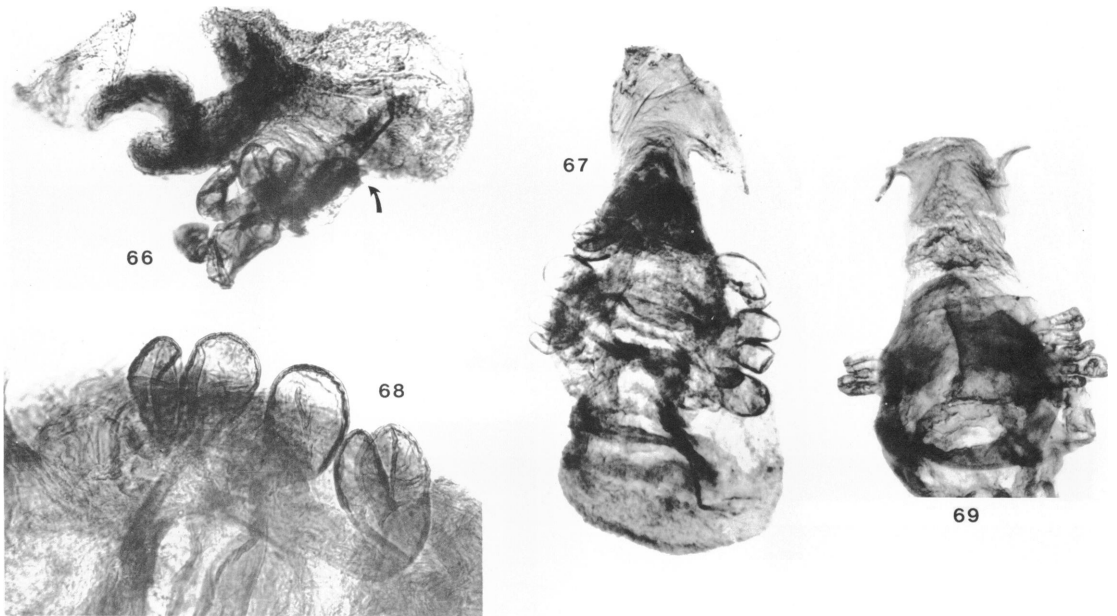
The eggsacs of *Archaea* and *Afrarchaea* have been examined. These are spherical, with the eggs thinly wrapped in fine silk. Approximately 60 spiderlings were counted in an eggsac of *Archaea workmani*, whereas six and 12 eggs, respectively, were enclosed in two eggsacs of *Afrarchaea godfreyi* examined. However, Millot and Legendre (1964) reported a range of only six to 16 eggs in several eggsacs of *Archaea vadoni*.

All the archaeids appear to have a clearly defined, ellipsoid, finely ridged area on the

outer surface of each chelicera (figs. 16, 29) which is generally assumed to be the file for a stridulatory mechanism. According to Millot (1948), this region is brought into contact with the group of serrate bristles invariably present on the third metatarsus (figs. 32, 33); similar bristles are present, however, on the palpal tarsus, and these could also be brought into contact with the files. A second stridulatory organ was recorded more recently by Legendre (1970b) in a number of species of *Archaea* from Madagascar and this is also present in the other genera. It consists of a sclerotized, transversely ridged structure on the anterior face of the abdomen above the petiole, which Legendre associated with a projection on the dorsal surface of the petiole. This mechanism is very similar to that found in the New Zealand stiphidiid *Cambridgea*, but unlike that genus (where it is present only in males) it is found in both sexes in the archaeids. It is of interest to find this structure even in the fossil *Eoarchaea hyperoptica*, the least modified of all the archaeids.



FIGS. 60–65. Archaeidae: *Austrarchaea nodosa* (Forster), male palp. 60, 61. Prolateral and retrolateral views; arrows indicate the sulcus dividing the bulb (as in mecysmaucheniids). 62–64. Terminal elements, prolateral, retrolateral, and distal views; note the long and sinuous embolus (E). 65. Embolus, showing short process at tip.



FIGS. 66–69. Archaeidae: female genitalia. 66–68. *Austrarchaea daviesae*, new species. 69. *A. hickmani* (Butler). 66. Lateral view, with posterior receptaculum on right; arrow indicates the position of the gonopore. 67. Ventral view. 68. Lateral receptacula. 69. Dorsal view, photographed from specimen labeled as “homotype” by Butler.

ARCHAEA KOCH AND BERENDT

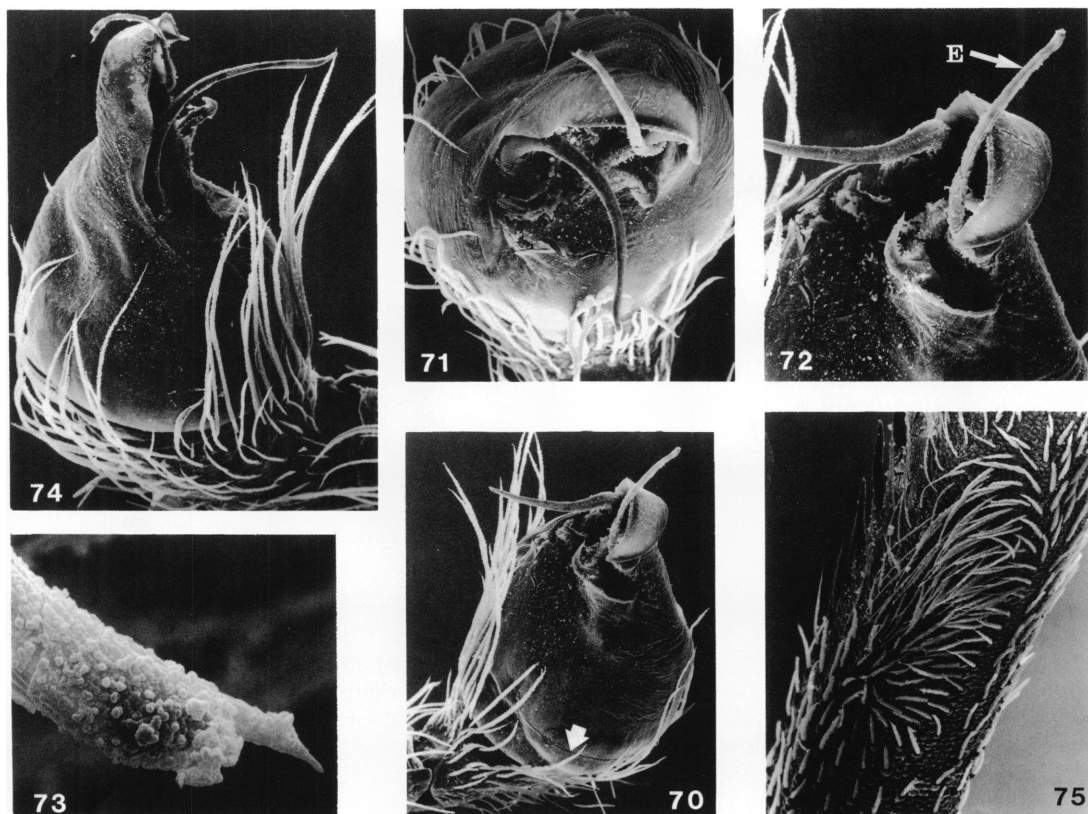
Figures 2, 7, 12, 20–25, 28, 29,
38, 39, 51, 52, 55, 56

Archaea Koch and Berendt, 1854, pp. 5, 19 (type species, designated by Thorell, 1870, p. 232, *Archaea paradoxa* Koch and Berendt).

Eriauchenius O. P.-Cambridge, 1881, p. 767 (type species by monotypy *Eriauchenius workmani* O. P.-Cambridge). First synonymized by Simon, 1895, p. 935.

NOTE: The type specimen of the fossil *Archaea paradoxa* Koch and Berendt, the type species, is apparently lost, and the original description is not detailed enough to establish with any certainty whether the species is congeneric with the extant species (which would otherwise be placed in O. P.-Cambridge’s genus *Eriauchenius*). Even if the type specimen were available, an unequivocal decision would not be forthcoming, as the internal genitalia would probably not be observable. However, Petrunkevitch (1942) selected a specimen from the British Museum collection (British Museum In. 18748, Klebs 506, No. 13874) on which to base his redescription

of the species. That description is detailed and includes enough information to decide conclusively that this specimen is closely related to the extant Madagascar species and is probably congeneric with them. The only character which could with some credibility be used to separate at a generic level the fossil species from the extant ones is his statement that the lateral eyes are widely separated in *A. paradoxa*. However, Petrunkevitch (1950) also recorded the eyes of the fossil *Archaea hyperoptica* Menge as being separated in the same way, but our examination of his specimen shows that he was mistaken—the eye group in that specimen is the same as in other archaeids. Petrunkevitch’s specimen of *A. paradoxa* should also be examined for this character; although we have not been able to do this, we have assumed that Petrunkevitch, who did not realize the significance of the eye placement, was mistaken in this instance also. If he was correct, then the genus *Archaea* (if based on the specimen described by Petrunkevitch) will need to be separated from the extant



FIGS. 70–75. Archaeidae: *Austrarchaea daviesae*, new species, male. 70. Palp, prolateral view; arrow indicates the sulcus dividing the bulb. 71. Palp, distal view. 72. Embolus (E), prolateral view; note the slender, straight shape. 73. Distal portion of embolus. 74. Palp, retrolateral view. 75. Retrolateral surface of chelicera below the tip of the fang, showing the clump of hairs against which the palpal cymbium rests.

Madagascar species, which then would revert back to *Eriauchenius*. From the viewpoint of nomenclatural stability, the designation of Petrunkevitch's specimen as a neotype for *A. paradoxa* would remove any doubts there may have been of the validity of the family in relation to the type species of *Archaea*, leaving only the question of the generic affinity between the fossil and Recent species to be investigated in the future.

DIAGNOSIS: *Archaea* can be distinguished from *Afrarchaea* and *Eoarchaea* by the presence of a slender "neck" between the head region and pars thoracica (fig. 2) and from *Austrarchaea* by the different form of the female genitalia, which lack anterior receptacula (figs. 55, 56).

DESCRIPTION: Pars cephalica strongly raised, connected to pars thoracica by dis-

tinctive, slender "neck" (figs. 2, 7). Carapace pustulate; pustules often forming patterns, each provided with lateral, flattened ciliate hair (fig. 12). Sides of carapace completely fused along midline below cheliceral foramen. Chelicerae (figs. 28, 29, 38, 39) very long, promargin with numerous peg teeth, retromargin with two or three true teeth, gland mound strongly developed, usually associated with few hairs. Sternum long, narrow, with sclerotized strips extending from lateral projections between coxae to carapace. Cuticle of abdomen thick but only rarely forming dorsal scutes, although epigastric region may be strongly sclerotized (longitudinal lateral ridges have been recorded for some fossil species but similar ridges appear in extant specimens in which abdomen is shrunken; hence this character may be artifactual). Fe-

male genitalia based mainly on bursal storage system characterized by presence of prominent secretory plate on anterior face of bursal cavity (figs. 55, 56); secretory pores bilaterally grouped, in some species forming uniform pattern but in others irregularly grouped; Traciuc and Legendre (1970) record distinct median posterior receptaculum in *A. vadoni* which we have been unable to locate in that species or *A. gracilicollis*. Male bulb (figs. 51, 52) ovoid, with embolus generally small, tubular, difficult to distinguish, but sometimes present as short spinous structure; cymbium relatively small; accessory structures always present but their homologies remain unknown. Female palp with claw reduced or absent.

INCLUDED SPECIES: Fossil (see key in Petrunkevitch, 1942, p. 199): *A. paradoxa* Koch and Berendt (1854); *A. conica* Koch and Berendt (1854); *A. laevigata* Koch and Berendt (1854); *A. sphinx* Menge, in Koch and Berendt (1854); *A. incomta* Menge, in Koch and Berendt (1854); *A. pougneti* Simon (1884); Recent (see key in Legendre, 1970a, p. 10): *A. workmani* O. P.-Cambridge (1881); *A. gracilicollis* Millot (1948); *A. vadoni* Millot (1948); *A. bourgini* Millot (1948); *A. jeanneli* Millot (1948); *A. pauliani* Legendre (1970a).

DISTRIBUTION: Fossil species from Baltic amber, extant species endemic to Madagascar.

AUSTRARCHAEA, NEW GENUS

TYPE SPECIES: *Archaea nodosa* Forster (1956).

ETYMOLOGY: The generic name refers to its Australian distribution and is feminine in gender.

DIAGNOSIS: *Austrarchaea* can be distinguished from the fossil *Eoarchaea* by the more strongly elevated pars cephalica and from the other Recent genera by genitalic characters: females have anterior receptacula and males have a long, slender embolus.

DESCRIPTION: Pars cephalica raised, "neck" distinctly narrower than caput but intermediate between *Archaea* and *Afrarchaea* (figs. 4-6). Carapace covered with setose tubercles forming rows on pars thoracica, bearing long, ciliate hairs (figs. 9, 10). Furrow present down carapace midline between lower margin of

cheliceral foramen and ventral border of carapace, wider and membranous in juveniles (figs. 45, 46). Chelicerae (figs. 34, 47) long, promargin with numerous peg teeth, retro-marginal with true teeth, gland mound well developed, near fang tip. Sternum similar in shape to *Afrarchaea* but not pustulate. Abdomen with dorsal scute in males. Anterior portion of female internal genitalia with number of small pyriform receptacula; posterior element consisting of large, membranous posterior receptaculum bearing numerous small internal lobes through which enclosing secretory cells discharge. Male bulb divided by transverse groove as in mecysmaucheniids (figs. 60, 61, 70); embolus prominent, consisting of long slender translucent duct projecting beyond bulb. Female palp with relatively strong claw which bears teeth on ventral surface.

INCLUDED SPECIES: *A. nodosa* (Forster); *A. daviesae*, new species; *A. hickmani* (Butler).

DISTRIBUTION: Eastern Australia (Victoria, New South Wales, and Queensland).

Austrarchaea nodosa (Forster), new combination

Figures 4-6, 9, 10, 19, 27,
34, 35, 57, 60-65

Archaea nodosa Forster, 1956, p. 151, figs. 1-7 (immature female holotype from Tallwallal, Lamington National Park, Queensland, Australia, in QMB, examined).

DIAGNOSIS: *Austrarchaea nodosa* can be easily distinguished from the other species by the presence of three pairs of large tubercles on the abdomen (Forster, 1956, fig. 1).

DISCUSSION: The original description, although based on an immature female, is sufficiently detailed to provide adequate identification, but we supplement it here with illustrations of the male and female reproductive organs in order to provide a basis of comparison with the new species, *A. daviesae*, described below.

The female genitalia are complex, with a large posterior receptaculum that is associated with a further membranous structure which projects forward to terminate in a transverse sac. There are 10 receptacula arising from the anterior face of the bursa and separable into two groups of five (fig. 57). The

posterior receptaculum is completely enclosed in a secretory gland which discharges through numerous pores into the lumen. The secretory gland enclosing each of the anterior receptacula discharges through a number of pores on the distal surface of each sac. The T-shaped lobe opening from the posterior receptaculum does not appear to have any secretory tissue associated with it.

The bulb of the male palp is pyriform and projects forward from the cymbium, which is considerably reduced in size. The embolus is strongly developed with a broad basal portion which narrows to a long, slender, coiled duct extending well beyond the bulb (figs. 60–65). The embolus is associated with a number of other accessory processes, some of them spinous, which due to the lack of material we have not been able to examine in detail. As in *A. daviesae* the embolus is translucent. Although we have not examined cleared mounts, the spermophore ducts appear to be large and lightly coiled within the bulb.

MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Bulburin State Forest, Mar. 25–28, 1977 (V. E. Davies, R. Raven, QMB), lf; Dandabah Bunya, on tree trunks at night, Mar. 3, 1976 (V. E. Davies, QMB), lf; Kroombit Tops, 65 km. SW Gladstone, rain forest, collected with pyrethrum, Feb. 23, 1982 (G. B. Monteith, QMB), lf; O'Reilly's Guest House, Wishing Tree Circuit, Lamington National Park, on mossy logs and tree trunks, Feb. 19, 1981 (G. Thompson, J. Gallan, D. Yeates, QMB), lm; Tallawallal, Lamington National Park, moss near *Nothofagus*, Oct. 31, 1955 (T. E. Woodward, QMB), 1 juvenile f (type).

DISTRIBUTION: This species appears to be limited to the southeast portion of Queensland and replaced by the closely related *A. daviesae* to the north. The southern extension of the distribution is not known, but the single known specimen from near Sydney, New South Wales, is closely related to or conspecific with the Victorian *A. hickmani* Butler.

***Austrarchaea daviesae*, new species**

Figures 66–68, 70–75

TYPES: Male holotype collected at night at Major's Mountain, Atherton Tableland, Queensland, Australia (April 14–20, 1978; V.

E. Davies and R. Raven) and female paratype from Malaan State Forest, Atherton Tableland, Queensland, Australia (April 20–24, 1978; V. E. Davies and R. Raven), deposited in QMB.

ETYMOLOGY: The specific name is a patronym in honor of Dr. Valerie Davies, Arachnologist, Queensland Museum, who has collected most of the available material and who first recognized the species as new.

DIAGNOSIS: *Austrarchaea daviesae* can be distinguished from *A. hickmani* by the presence of abdominal tubercles, and from *A. nodosa* by the presence of two instead of three pairs of abdominal tubercles, the development of paired "horns" on the caput, the absence of a lateral lobe on the chelicerae, and the strikingly different form of male palpal bulb.

FEMALE: Carapace 0.52 long, 0.56 wide, 1.40 high. Abdomen 0.68 long, 0.52 wide, 0.96 high. Cephalothorax and chelicerae dark reddish brown. Abdomen strongly mottled with black pigment (forming three lines along ventrolateral surface) and numerous pale spots tending to form rows. Dorsal surface of caput sloping gently up from anterior to posterior margin, where two distinct "horns" are situated; additional low, rounded mound on each side at about one-third of distance back from posterior margin. Thorax and neck strongly pustulate, pustules forming rows on lateral margins, each bearing slender ciliate hair which lies flat on carapace surface. Caput not tuberculate but closely covered with squat, procumbent ciliate hairs. Ratio of AME:ALE:PME:PLE, 5:5:4:5; two lateral eyes on each side and each pair of median eyes situated on prominent tubercle; AME separated from each other by five times, from PME by distance equal to, AME diameter; laterals contiguous, separated from AME by three times AME diameter. Sternum longer than wide (8/5), almost rectangular in outline, with weak projections laterally between coxae; posterior margin broadly obtuse but margins on each side sloping slightly so as to form blunt median projection; coxae IV subcontiguous. Endites directed across labium to meet in midline; serrula strongly developed with single row of teeth extending across distal margin. Labium as wide as long, anterior margin indented. Chelicerae 1.24 long, typical, with

peg teeth along promargin and in single row extending back down ventral surface to almost half of length; four true teeth on retromargin; cheliceral gland mound well developed, situated on retromargin near fang tip; typical stridulatory plate present on retromargin at three-quarters of length; proximal lobe (well developed in *A. nodosa*) reduced to inconspicuous swelling.

Abdomen triangular in outline when viewed from side, distinctly higher than long, with only two pairs of tubercles, both rising from apical surface; cuticle distinctly thickened, tending to form ridges which are longitudinal near ventral surface but directed dorsally from mid-surface; entire surface clothed with adpressed ciliate hairs ranging from subspatulate to filiform. Six spinnerets, anterior pair of normal size, two-segmented, subcontiguous; posteriors also two-segmented but much more slender than anteriors; medians placed in line between posteriors so as to form transverse row; colulus absent.

Legs clothed with short ciliate hairs; tibiae with two or three trichobothria, each associated with patch of dark pigment; metatarsi with single trichobothrium; bothria similar to those of *A. nodosa*; tarsal organ capsulate; spatulate hairs present on leg I as in *A. nodosa*; claws also similar to those of *A. nodosa*. Pedipalp with distinct tarsal claw.

	I	II	III	IV	Palp
Femur	1.48	1.00	0.76	1.04	0.20
Patella	0.52	0.20	0.20	0.24	0.12
Tibia	1.16	0.98	0.68	0.80	0.24
Metatarsus	0.60	0.36	0.24	0.36	—
Tarsus	<u>0.40</u>	<u>0.24</u>	<u>0.20</u>	<u>0.24</u>	<u>0.24</u>
Total	4.16	2.78	2.08	2.68	0.80

Female genitalia very similar to those of *A. nodosa* but with two groups of receptacula more widely separated and anterior process not terminating in strong transverse lobe (figs. 66–68); surface in front and behind epigastric furrow strongly distended.

MALE: As in female except for the following. Carapace 0.44 long, 0.44 wide, 1.12 high. Abdomen 0.80 long, 0.44 wide, 0.68 high. Abdomen with distinct brown scute covering dorsal surface from petiole to anterior pair of tubercles. Chelicerae 1.08 long, with slightly raised portion on retrolateral surface at

about two-thirds of length where hairs are distinctly longer, more numerous than on rest of surface (fig. 75); significance of this structure unknown but when palp is in resting position, cymbium is in contact with those hairs. Cuticle of abdomen seems thicker than in female; each of abdominal hairs arises from small sclerotic plate; ridging of lateral surface more pronounced (this may be due to contraction of abdomen).

	I	II	III	IV	Palp
Femur	1.32	0.88	0.72	0.84	0.24
Patella	0.48	0.20	0.16	0.16	0.08
Tibia	1.08	0.76	0.64	0.76	0.16
Metatarsus	0.56	0.32	0.24	0.32	—
Tarsus	<u>0.36</u>	<u>0.24</u>	<u>0.20</u>	<u>0.20</u>	<u>0.12</u>
Total	3.80	2.40	1.96	2.28	0.60

Bulb pyriform; as in *A. nodosa* divided by transverse groove near base (fig. 70); distal ridge which separates bulb from its appendages produced into strong projection overhanging distal portion, apparently acting as a conductor for embolus; embolus a straight translucent tube projecting forward, flanked by more conspicuous, stouter, spiniform process (figs. 70–74); further smaller hooked lobe at base of process, similar in appearance to median apophysis of many entelegyne spiders.

OTHER MATERIAL EXAMINED: A female and juvenile male taken by sweeping at Finch Hatton, Queensland, April 7–14, 1975, by V. E. Davies and R. Kohout (QMB).

DISTRIBUTION: Northeastern and mideastern Queensland.

Austrarchaea hickmani (Butler),
new combination
Figures 40–50, 69

Archaea hickmani Butler, 1929, p. 46, pl. 2, figs. 1–5 (juvenile female holotype from Victoria, Australia [no specific locality], in NMV, examined).

DIAGNOSIS: *Austrarchaea hickmani* can be distinguished from the other two species of the genus by the different shape of the carapace (figs. 40, 41, 45), which lacks any indication of “horns,” by the paucity of setose tubercles on the lateral surface of the neck, and by differences in the female genitalia.

DISCUSSION: The more squat carapace described by Butler for this species readily separates it from the two Queensland species, whereas the apparent lack of setose tubercles suggests that the species might not even be congeneric with them. An immature female similar to *A. hickmani* collected from near Sydney, New South Wales, also shares these characters, in particular the complete absence of setose tubercles on the carapace.

Some of Butler's type material was deposited in the National Museum, Victoria, and fortunately this includes the type specimen of *A. hickmani*, which has been examined. The specimen is an immature female in rather bad condition, but sufficient information was gained from the examination to show that it is similar to the New South Wales specimen which we have illustrated.

Accompanying the type is a mature female labeled as a "homotype," and apparently collected by Butler after the description of *A. hickmani* was published. We examined the genitalia of this specimen (fig. 69). They are similar to the other two species of *Austrarchaea* but the lateral receptacula are more widely spaced. This specimen could be conspecific with the type specimen but nevertheless shows a number of features not present in the type. The shape of the carapace is the same, although larger, but the hairs are much more numerous and there are two rows of small setose tubercles on each side of the neck and a number on the anterior surface distributed in much the same way as in the Queensland species.

There are three separate plates on the epigastric region. A triangular plate leads from the epigastric furrow, with its pointed extremity between two sclerotized pulmonary plates. There is an additional sclerotic ring encircling the petiole. The abdominal hairs are more numerous than in the type specimen and each hair arises from a small sclerotic plate. The dorsal surface of the abdomen is undulating but no definite tubercles are present, in contrast to the specimen figured from New South Wales (fig. 40). The internal genitalia are little different from the two Queensland species but the lateral receptacula, which number six on each side, are widely separated and lie on each side of the median sac.

It is possible that the three specimens ex-

amined belong to three separate species, with the two immature specimens representing different species within *Austrarchaea* or even a separate genus. The problematical feature is the absence of setose tubercles on the carapace of both of the immature specimens, including Butler's type specimen. Immature specimens of both of the Queensland species do not differ from the adults in this character. If the lack of setose tubercles was also a characteristic of the adults of *A. hickmani*, there would be a strong case for the establishment of a separate genus, as this condition is elsewhere known only in the fossil *Eoarchaea*. If the lack of setose tubercles is merely a neotenous character in *A. hickmani*, then the absence of these structures is of little significance in *Eoarchaea*, as the type specimen on which this genus is based is also probably immature. The shape of the carapace is, however, diagnostic in that genus. In opposition to the view that a number of species are involved are the facts that the shape of the carapace, the absence of "horns," the lack of a lateral lobe on the chelicerae, and the suppression of the dorsal tubercles on the abdomen are common to all of the specimens. Meanwhile we have concluded that the adult female from Butler's collection is conspecific with his type specimen, and that the New South Wales specimen is either conspecific or belongs to a closely related species.

MATERIAL EXAMINED: AUSTRALIA: *New South Wales*: Kuringai (OMD), 1 juvenile f. *Victoria*: no specific locality (NMV), 1 juvenile f (type), 1f (labeled "homotype").

DISTRIBUTION: Victoria and New South Wales.

AFRARCHAEA, NEW GENUS

Figures 1, 3, 8, 11, 18, 26, 30-33,
36, 37, 53, 54, 58, 59

TYPE SPECIES: *Archaea godfreyi* Hewitt (1919).

ETYMOLOGY: The generic name refers to its African distribution and is feminine in gender.

DIAGNOSIS: *Afrarchaea* can be distinguished from the fossil *Eoarchaea* by the more marked elevation of the pars cephalica and from both *Archaea* and *Austrarchaea* by the lack of a strongly constricted "neck" and the different form of the female genitalia.

DESCRIPTION: Pars cephalica raised but little higher than width of carapace (fig. 1); portion of carapace between caput and thorax strongly developed, not markedly differentiated from head; slope from posterior margin of head indented at junction with pars thoracica; lateral eyes much closer to medians than in *Archaea* or *Austrarchaea* (figs. 3, 8). Carapace with numerous closely spaced tubercles, each bearing relatively short, finely ciliate procumbent hair; tubercles fewer dorsally, where with longer hairs (fig. 11). Furrow down midline of carapace below cheliceral foramen very narrow. Chelicerae (figs. 36, 37) apparently lacking true teeth on retromargin. Sternum distinctly longer than wide, not as narrow as in *Archaea*, covered with prominent pustules. Abdomen without dorsal scute in males. Female genitalia with anterior poreplate as in *Archaea* but relatively smaller, with secretory pores localized within four depressions; prominent sclerotic structure above plate consisting of broad thin horizontal plate from which prominent keel arises down center line (figs. 58, 59). Male bulb (figs. 53, 54) ovoid, similar to that of *Archaea*. Female palpal claw weakly developed (fig. 26).

INCLUDED SPECIES: Only the type species.

DISTRIBUTION: South Africa and Madagascar.

EOARCHAEA, NEW GENUS

Figures 13–17

TYPE SPECIES: *Archaea hyperoptica* Menge, in Koch and Berendt (1854).

ETYMOLOGY: The generic name refers to the antiquity of the genus, known only from Baltic amber, and is feminine in gender.

NOTE: The type specimen of *A. hyperoptica* is probably lost, but the species was redescribed by Petrunkevitch (1950, p. 265, figs. 4–10, 187) on the basis of a specimen from the MCZ. The comments below are based on an examination of that MCZ specimen.

DIAGNOSIS: *Eoarchaea* can be distinguished from the other archaeid genera by the relatively squat carapace, the absence of a "neck," and the lack of tubercles on the carapace.

DISCUSSION: The total length of the specimen is 1.75. It is probably a female one or two molts from maturity. The carapace is approximately one and one-half times as long

as high. The surface slopes evenly back from the caput to the posterior margin (figs. 13, 14). There are no tubercles present and the few hairs which can be distinguished on the caput are finely serrate or plumose and rise directly from the surface. The cuticle is very finely reticulated. The eight eyes, placed near the anterior margin above the chelicerae, are subequal and distributed as in other archaeids. The lateral eyes are contiguous (fig. 14, arrow) and widely separated from the medians. Each pair of median eyes is widely separated from each other so that the AME and PME on each side are closer together than they are to the opposite pair (this is in strong contrast to Petrunkevitch's observations on the same specimen; he apparently had some difficulty in distinguishing between the external surface of the eyes and the internal mold where the capsules have pulled away on one side, and concluded that not only were the anterior eyes much larger than the posteriors but that the two rows were clearly separated). The sternum is much longer than wide and is obtuse posteriorly, where the fourth coxae are subcontiguous. The chelicerae are long and slender, widest proximally, where there is a well-developed finely ridged stridulatory area (fig. 16). There are no lateral lobes. The promargin is provided with peg teeth, as in the other genera, which are relatively long and in a single row. We were not able to see peg teeth beyond the tip of the fang but there are a number of socket bases, which suggests that the ventral dentition is typical for the family. The retromargin is obscured and it is not known whether there are true teeth present. The cheliceral mound is not visible.

The abdomen is slightly ellipsoid and sparsely clothed with relatively long, weakly setose hairs arranged in oblique rows. Petrunkevitch noted that the cuticle is longitudinally furrowed but our examination showed narrow longitudinal lines where the cuticle is smooth rather than actual furrows. The hairs are widely spaced in a single row between these areas (fig. 15). There are six spinnerets as in other archaeids and although these are slightly obscured and difficult to bring sharply into focus, they seem typical. The lamellae of the anterior booklungs on one side are preserved and are typical. In

view of the suggestion that the primitive archaeid might have been quadripulmonate we were particularly interested to see whether there is any trace of a posterior pair of booklungs but there are no internal manifestations of this organ. There is, however, a small aperture visible on one side of the abdomen, at slightly more than one-third of the distance from the spinnerets, which could be a spiracle; if so, its small size would suggest that the respiratory system is identical with the living species, in which paired spiracles each lead into a slender tube. Petrunkevitch stated that the specimen is an immature female and the absence of any internal genitalic structures supports this conclusion, as judging by the persistence of the booklungs there is no reason why the sclerotized portion of the internal genitalia should not also have survived. There is a stridulatory plate with transverse ridges on the anterior surface of the abdomen above the petiole as in the Recent genera.

The legs are without spines, with a single trichobothrium on each metatarsus and two or more on some tibiae. We have not been able to locate any spatulate hairs on the front pairs of legs, and the absence of the typical elongate socket bases found in other genera suggests that these may not be present. The onychia bearing the claws are more slender and longer than in Recent genera, but this may be due to shrinkage during preservation. The femur of the palp bears a row of six small denticles down the ventral surface, each of which has a distal hair (fig. 17). The palpal tarsal claw is not present.

The shape of the carapace of *Eoarchaea* gives rise to the thought that the spider might be a mecysmaucheniid rather than an archaeid. However, the form of the sternum, the presence of stridulatory ridges on the anterior surface of the abdomen, and the presence of six spinnerets clearly place the genus in the Archaeidae. If the presence of paired spiracles could be confirmed then the assignment of the genus would be beyond any doubt. The failure to find spatulate hairs on the anterior legs was unexpected, but the hairs can be difficult to see even in Recent material. The tarsi on a number of the legs show structures under higher power which are probably capsulate tarsal organs; at any rate there is

certainly no sign of the type of exposed tarsal organ characteristic for the mecysmaucheniiids, which if present would be visible at this magnification.

INCLUDED SPECIES: Only the type species.

DISTRIBUTION: Baltic amber.

MECYSMAUCHENIIDAE SIMON

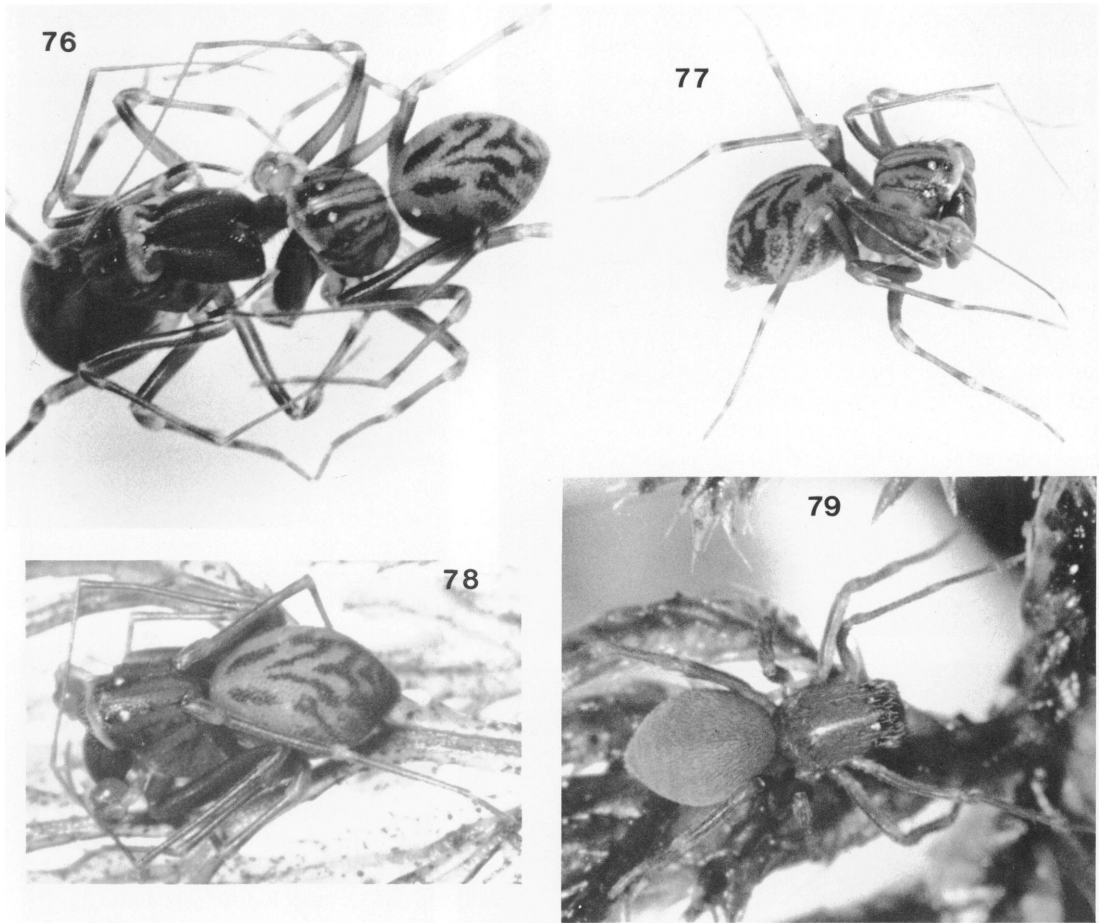
Mecysmauchenieae Simon, 1895, p. 935 (type genus *Mecysmauchenius* Simon).

Mecysmaucheniinae: Petrunkevitch, 1928, p. 48.

Mecysmaucheniiidae: Lehtinen, 1967, p. 290.

DIAGNOSIS: Mecysmaucheniiids can be distinguished from all other spiders by the combined presence of chelicerae originating from a foramen in the carapace and only two spinnerets.

DESCRIPTION: Small to medium-sized cribellate, haplogyne, araneomorph spiders. Eight or six subequal eyes, in two rows; laterals contiguous, widely separated from medians; median eyes well separated from each other (figs. 80, 82). Carapace with pars cephalica raised so that when viewed from side almost rectangular in outline (figs. 84–89); region between caput and pars thoracica not constricted; surface of carapace without tubercles (except in *Mesarchaea* and below chelicerae in *Semysmauchenius* and some *Mecysmauchenius*), cuticle finely scaled (fig. 81). Anterior margin of carapace encircling base of chelicerae, which extend from oval foramen (fig. 83); foramen containing small triangular sclerite ventrally between chelicerae only in *Zearchaea*. Chelicerae (figs. 116–124) long, stout or slender, fang relatively short, promargin with at least some peg teeth, further group of peg teeth opposite fang tip, not extending down ventral surface as in archaeids; retromargin without true teeth, smooth; cheliceral gland opening from distinct mound situated on retromargin between fang tip and origin. Poison gland endocephalic, may extend well into cephalothorax above nerve mass. Outer surface of chelicerae with stridulatory ridges either evenly spaced or grouped into series, apparently activated by picks (modified setal bases) on palpal femur. Endites directed across labium, almost meeting at midline; serrula strongly developed as single row of teeth (figs. 102, 103). Labrum strongly developed, bearing paired



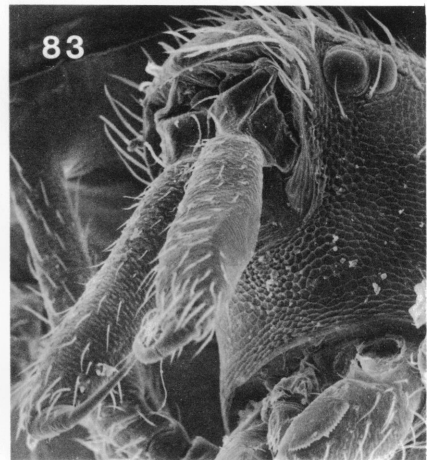
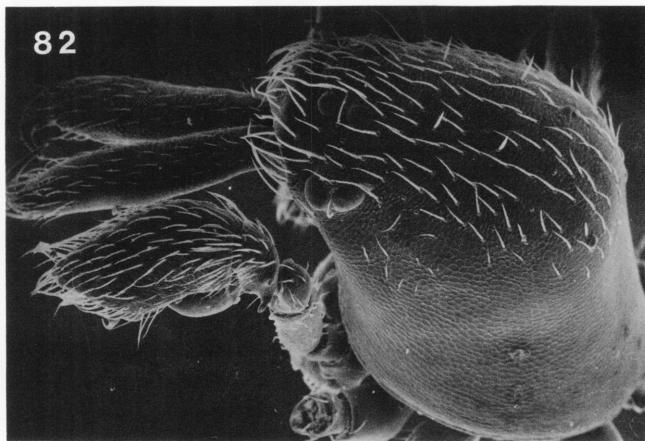
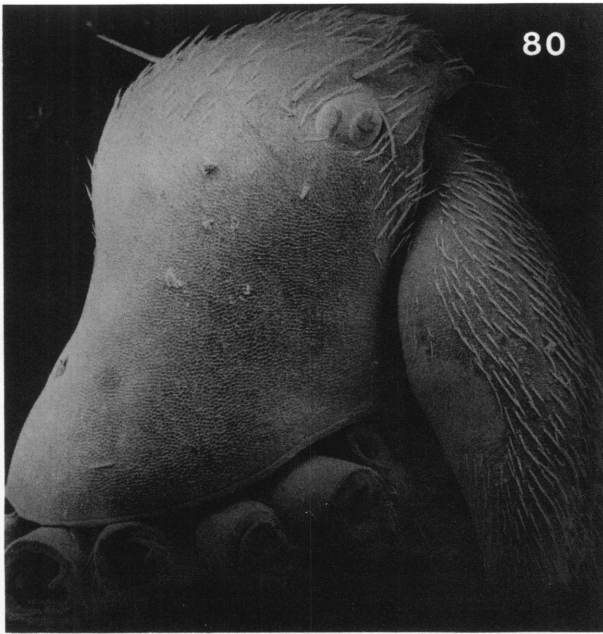
FIGS. 76–79. *Mecysmaucheniidae*. 76–78. *Aotearoa magna* (Forster). 79. *Zearchaea clypeata* Wilton. 76. Male spider (right) adopting the mating stance; note the spread of the fangs. 77. Male walking; note that the two anterior pairs of legs are raised. 78. Male in resting position with the legs bent back against the body. 79. Female.

lateral protuberances as in archaeids (figs. 90–92). Sternum scutiform, not much longer than wide, pointed posteriorly, with elevations opposite coxae I–III and between subcontiguous coxae IV.

Abdomen oval in outline, without tubercles; cuticle thin, without dorsal scuta, with or without distinct color pattern (figs. 76–79), with paired scuta ventrally in some females; epigastric region usually with small sclerotized plate; anterior surface without stridulatory file. Abdominal hairs short, plumose (thickened in *Mesarchaea*). Two spinnerets; medians and posteriors reduced so that only spigots remain (figs. 97–101), arranged in

transverse row behind anteriors, grouped so that original four spinnerets distinguishable (one spigot for medians, three for posteriors); anterior spinnerets contiguous; colulus represented only by hairs. Female genitalia restricted to anterior face of bursal cavity, consisting of arched median receptaculum and several small receptacula leading into bursa through long, slender ducts.

Legs slender, clothed with strongly plumose hairs; without spines; no scopula hairs or claw tufts present. Tarsi with small ring of unsclerotized cuticle near base as in archaeids (fig. 136); three claws situated on weakly developed onychium. Single subdistal tricho-



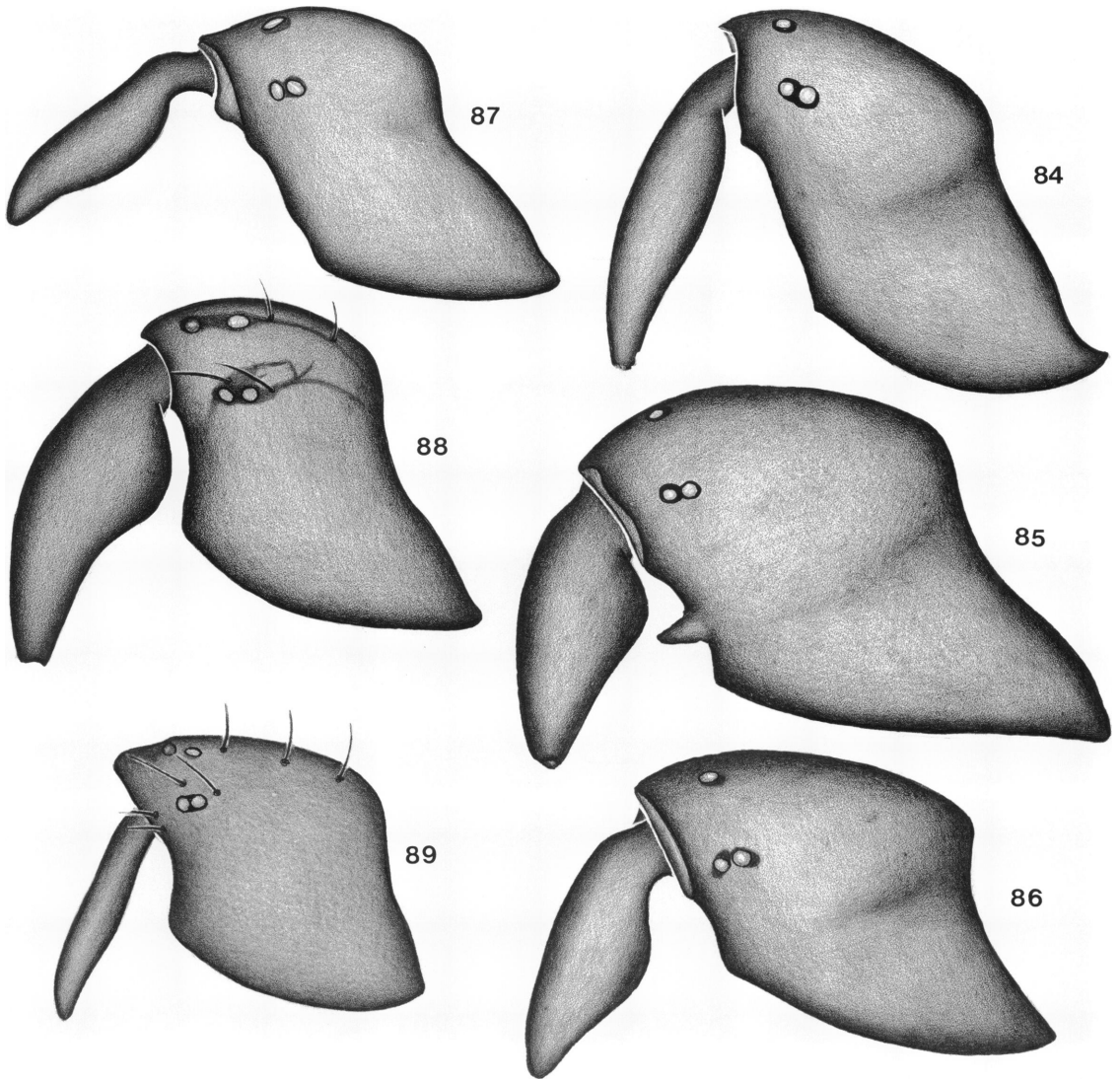
FIGS. 80–83. Mecysmaucheniidae. 80, 81. *Aotearoa magna* (Forster). 82, 83. *Zearchaea fiordensis* Forster. 80. Carapace and chelicera of female. 81. Surface of carapace, showing the scalelike integument. 82, 83. Carapace and chelicerae of male, oblique lateral and anterior views.

bothrium on each metatarsus, two or three on tibiae; bothria (figs. 94–96) with posterior hood either smooth or transversely ridged (not as strongly as in archaeids). Tarsal organ exposed, with strong receptor spine and one or more smaller receptor lobes (figs. 104–115). Female palp without claw. Male palp often with accessory processes on tibia; bulb pyriform, with embolus and accessory processes distally situated, divided by transverse groove

(figs. 207, 208) as in archaeids; embolus short, inconspicuous.

Heart with three pairs of ostia. Respiratory system consisting of anterior booklungs and spiracle opening from small sclerotized plate near (but clearly separated) from base of spinnerets, leading into four slender tracheal tubes limited to abdomen.

INCLUDED SUBFAMILIES: Mecysmaucheniinae, Zearchaeinae.

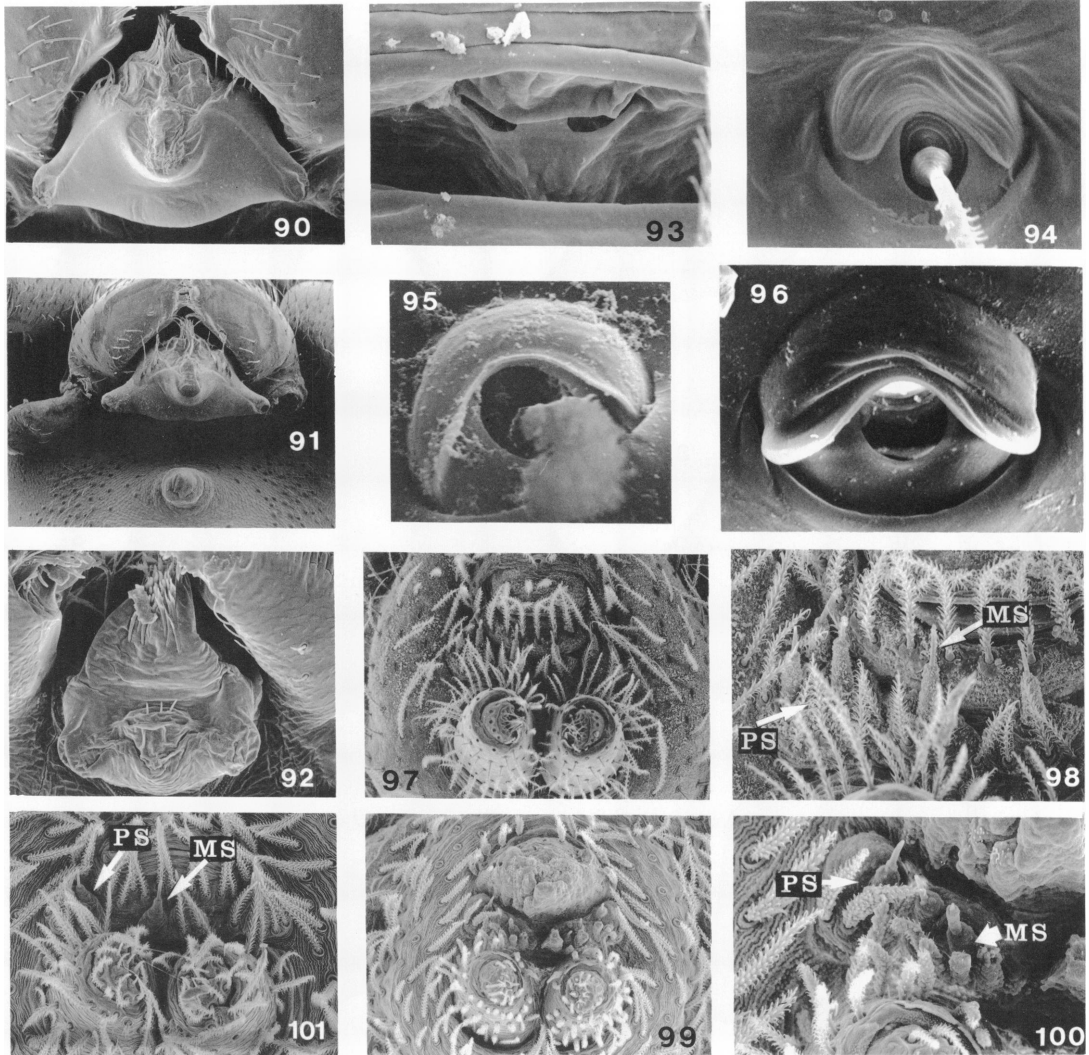


FIGS. 84–89. Mecysmaucheniidae: lateral view of carapace and chelicera. 84. *Mecysmauchenius osorno*, new species. 85. *M. eden*, new species. 86. *M. segmentatus* Simon. 87. *Mecysmauchenioides nordenskjoldi* (Tullgren). 88. *Aotearoa magna* (Forster). 89. *Zearchaea fiordensis* Forster.

DISTRIBUTION: Southern South America and New Zealand.

DISCUSSION: The family limits as restricted in the present paper are narrow so that the spiders are easily recognized and clearly separated from the various genera which have in the past been associated with them. The monophyly of the seven genera we include in this family has never been questioned. The point which may be argued is whether this

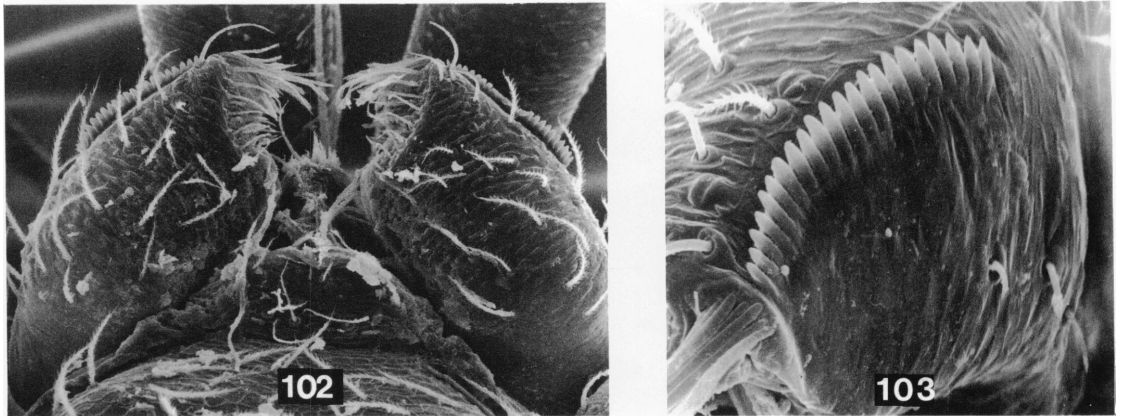
group of genera warrants recognition as a family taxon separate from the Archaeidae. Lehtinen (1967), who considered that the group did warrant family status and even went so far as to propose that the family is not related to the archaeids at all, also associated *Pararchaea* with these genera, completely overlooking the major differences in the number of spinnerets and the form of genitalia. His comments were not based, how-



FIGS. 90–101. Mecysmaucheniidae. 90, 93, 96. *Mecysmauchenius segmentatus* Simon. 91, 97, 98. *M. eden*, new species. 92, 94, 99, 100. *Zearchaea clypeata* Wilton. 95. *Mecysmauchenioides nordenskjoldi* (Tullgren). 101. *Zearchaea fiordensis* Forster. 90–92. Labrum, with dorsal edge at bottom; note paired lateral protuberances. 93. Anterior wall of bursal cavity, showing the paired slits which lead into the receptacula. 94–96. Trichobothria. 97–101. Spinnerets of female, showing spigots representing median (MS) and posterior (PS) pairs.

ever, on first-hand knowledge of *Pararchaea*. There are a number of clearcut characters on which separation from the true archaeids may be based. The tarsal organ is of the exposed form, and not capsulate as in the Archaeidae, and the tracheal system is radically different, as are the female genitalia. The mecysmaucheniid carapace, although lacking the gross development of most of the archaeids, is

probably close to the common plesiomorphic form for both families, as evidenced by the fossil *Eoarchaea*. The complete absence of true teeth on the chelicerae of the mecysmaucheniids could be either plesiomorphic or apomorphic, depending on whether the true teeth on the retromargin of the cheliceral furrow of most archaeids is a primary or secondary development. The eye groups of both



FIGS. 102, 103. Mecysmaucheniidae: *Zearchaea clypeata* Wilton. 102. Endites and labium. 103. Serrula.

the archaeids and the mecysmaucheniids are similar, although the positioning of the pairs of eyes on prominent mounds is strongly developed in the Archaeidae. The complete absence of spatulate hairs on the anterior legs of the mecysmaucheniids (and the pararchaeids) is of interest and in marked contrast to the Archaeidae.

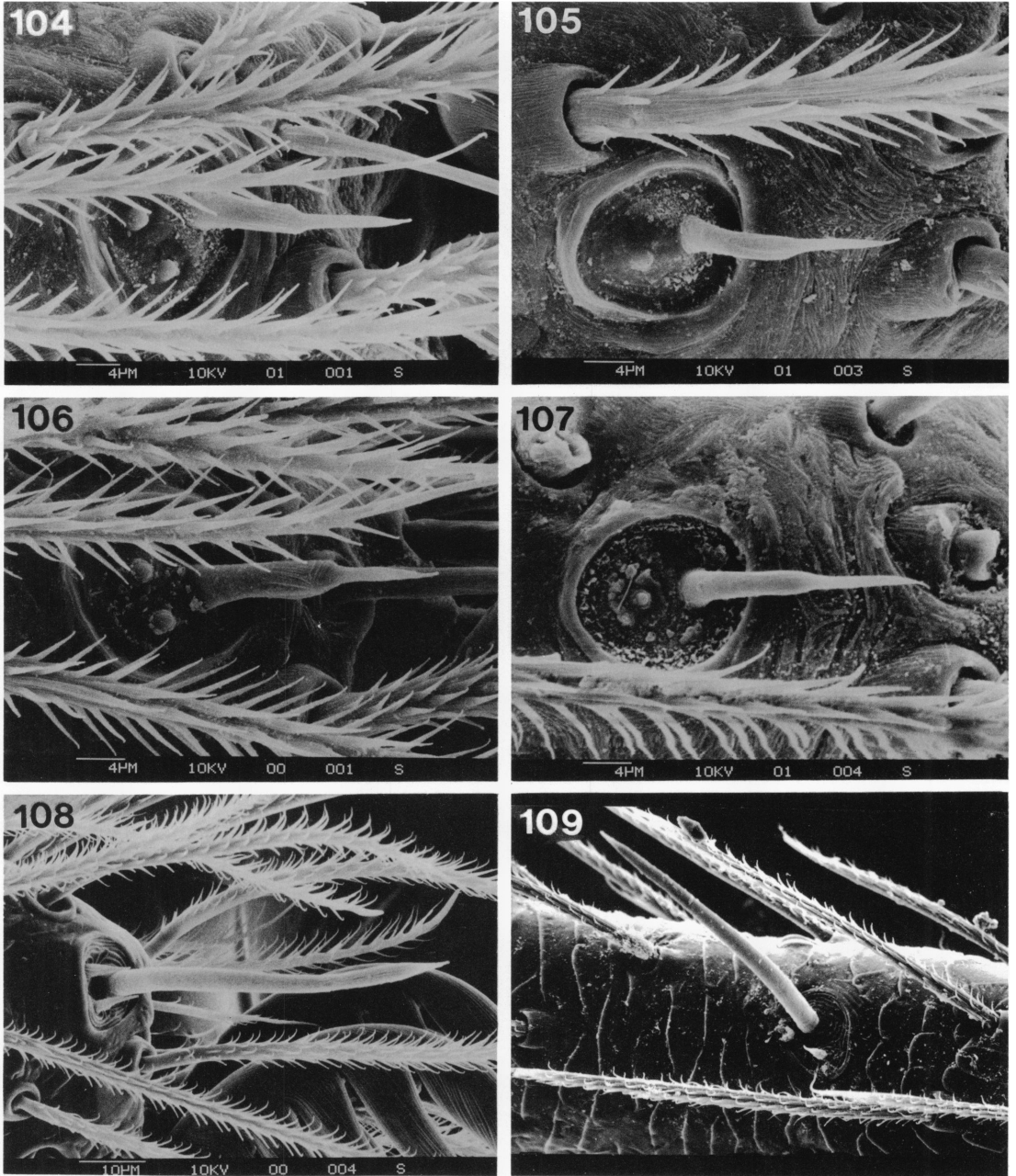
Not knowing the function and possible homologies of the various processes found on the palpal bulbs in both families, it is not possible to discuss these structures meaningfully; nevertheless, it is worthy of notice that in both families the bulb is divided by a distinct transverse groove. The embolus is rarely conspicuous in either family, but where it does become more prominent the tendency seems to be for the accessory processes to be reduced (as in *Zearchaea*, fig. 192).

At present the mecysmaucheniids are restricted to New Zealand and southern South America and in fact complement the known southern distribution of the true archaeids. Whether this restricted distribution is actual remains to be seen, but as far as Australia is concerned active collecting of the leaf litter and moss fauna which has revealed many other previously rare or unknown species has failed to produce any mecysmaucheniids; if they are present in this continent then they must be very restricted in their distribution.

NATURAL HISTORY: The mecysmaucheniids are all cryptozoic in habit, in contrast to many of the archaeids, which are found in the understory of forests. Like the archaeids,

they do not construct a snare. In New Zealand the mecysmaucheniids are primarily forest-dwelling spiders which are usually found in moss in damp conditions. In some parts of New Zealand, *Zearchaea* has also been found in tussock grassland (but only where the rainfall is high and a constant humidity is maintained at the base of the tussock). *Aotearoa*, which is limited to wet beech forest in the southern region of New Zealand, constructs purse retreats in the moss on sloping banks and tree trunks and the plano-convex eggsac may be found within these structures in association with the female. In captivity these spiders will feed on a wide range of the invertebrates which live in this habitat (including smaller spiders) but there seems to be little support for the suggestion that, like the archaeids, they are obligate araneophages.

Although the South American mecysmaucheniids are also usually taken from forest litter and moss, there are records of them being collected in grassland and fields. Velard (1957) stated that *Mecysmauchenius segmentatus* does not make a web but is found in tubes. He also reported that small white lenticular cocoons, 4 or 5 mm. in diameter, were found singly under leaves where the spiders were living, and he presumed that these were the eggsacs of *M. segmentatus*. He also noted that toward late summer and autumn (February to early April) only adults were present and from this data suggested that the eggs pass through the winter in the eggsac. He reported that a female was found in the

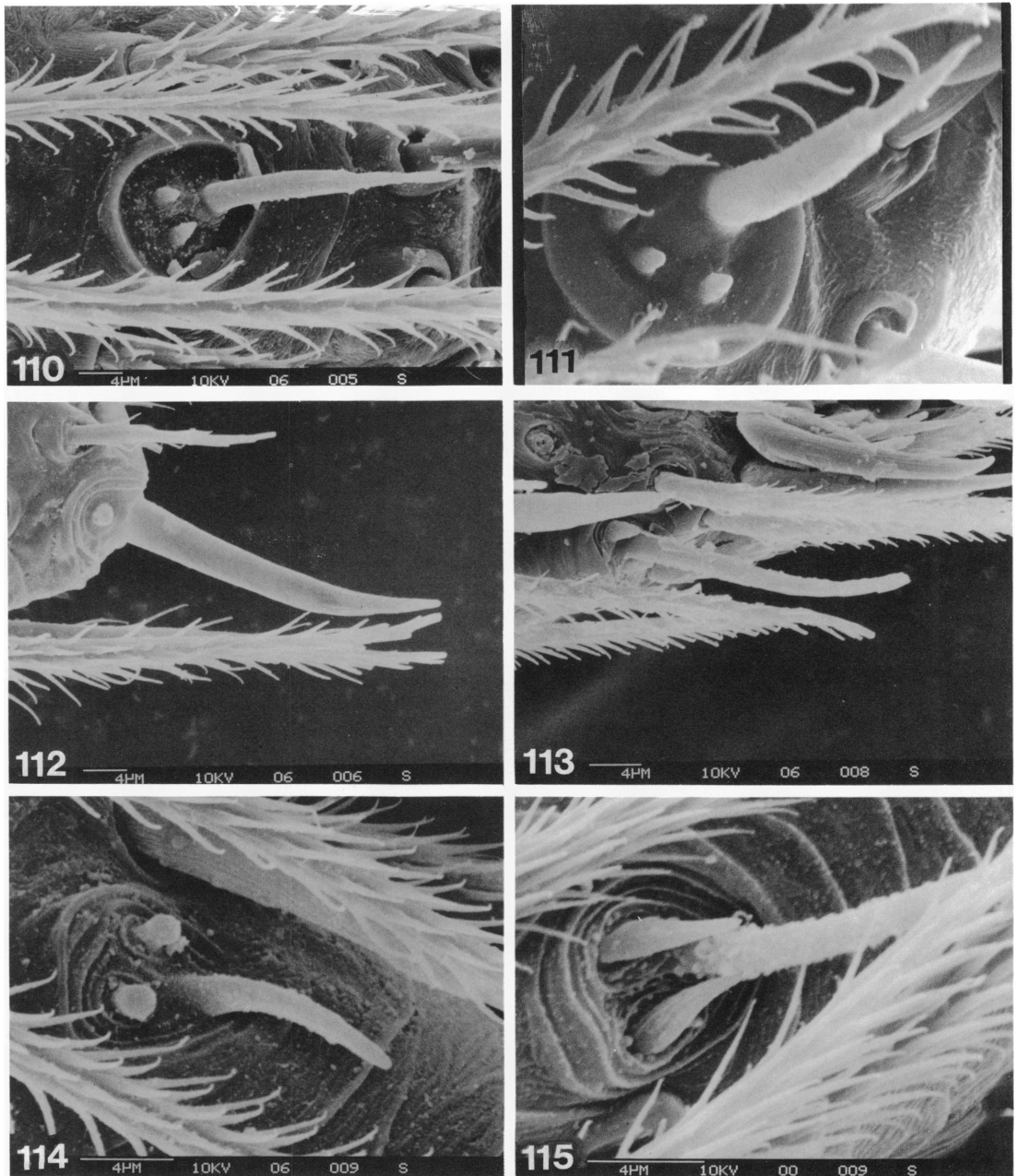


FIGS. 104–109. *Mecysmaucheniidae*: tarsal organ. 104–107. *Mecysmauchenius segmentatus* Simon. 108, 109. *M. osorno*, new species. 104, 105. Male, organ from anterior and posterior legs. 106–109. Female, organ from anterior and posterior legs.

field with a partly eaten spider in its chelicerae, but he also found that the spiders readily ate moths and *Drosophila* in captivity.

MECYSMAUCHENIINAE SIMON

DIAGNOSIS: *Mecysmaucheniinae* can be distinguished from *zearchaeinae* by the pres-

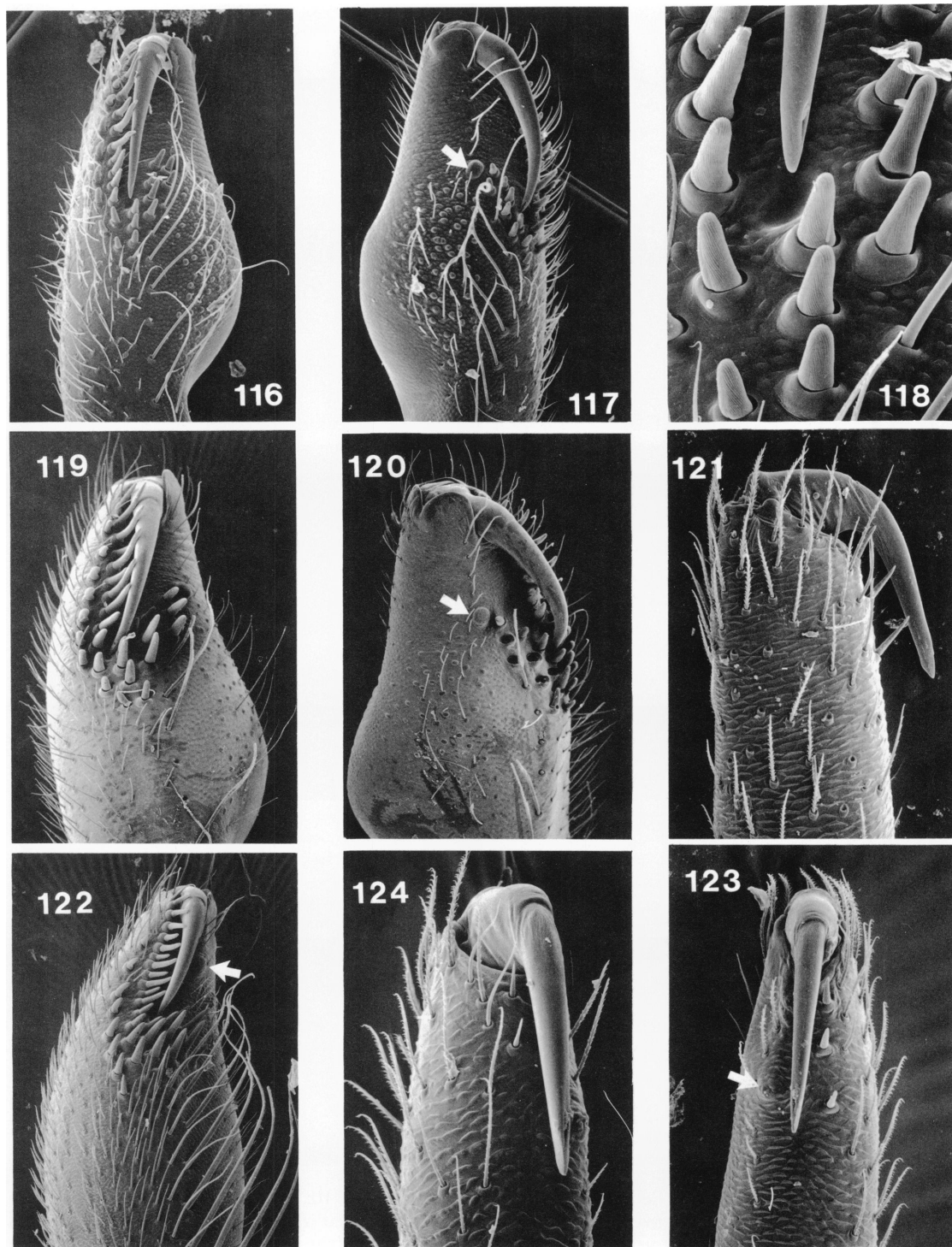


FIGS. 110–115. *Mecysmaucheniidae*: tarsal organ of females. 110, 111. *Mecysmauchenioides nordenskjoldi* (Tullgren). 112. *Aotearoa magna* (Forster). 113. *Zearchaea clypeata* Wilton. 114. *Z. fiordensis* Forster. 115. *Chilarchaea quellon*, new species. 110, 112–115. Organ from anterior legs. 111. Organ from posterior legs.

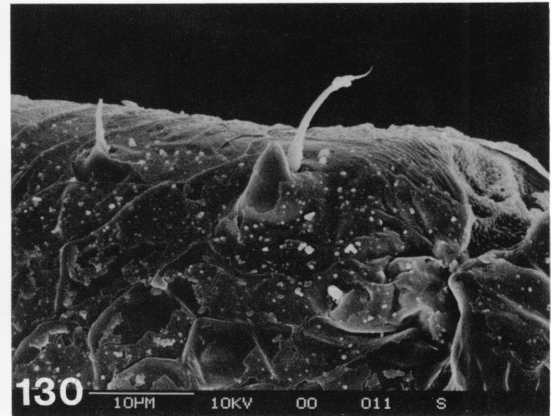
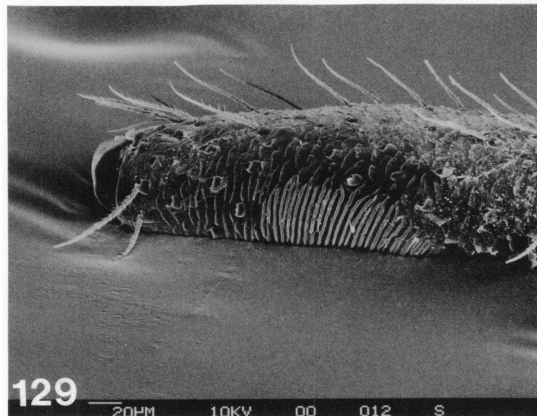
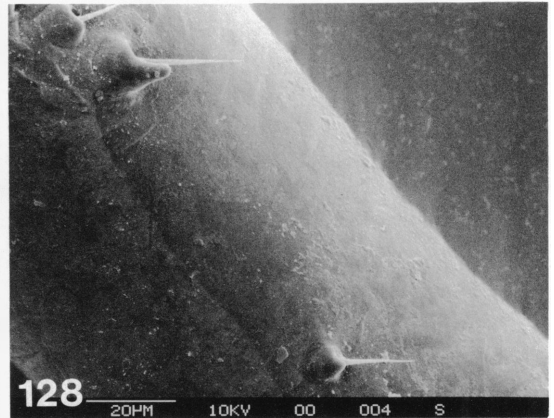
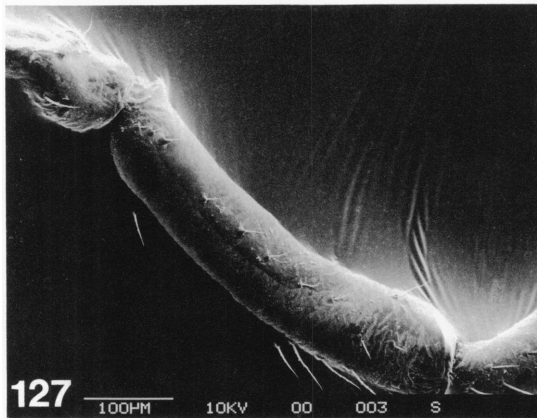
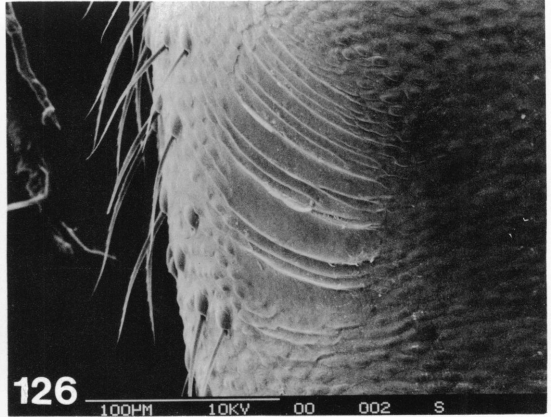
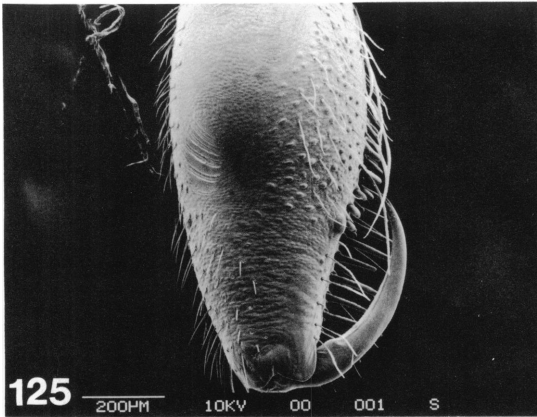
ence of two rows of peg teeth on the cheliceral promargin (figs. 116, 119, 122).

DESCRIPTION: Clypeus sometimes thick-

ened and elongated at middle but not arched and bulging. Cheliceral promargin with external row of short peg teeth and internal row



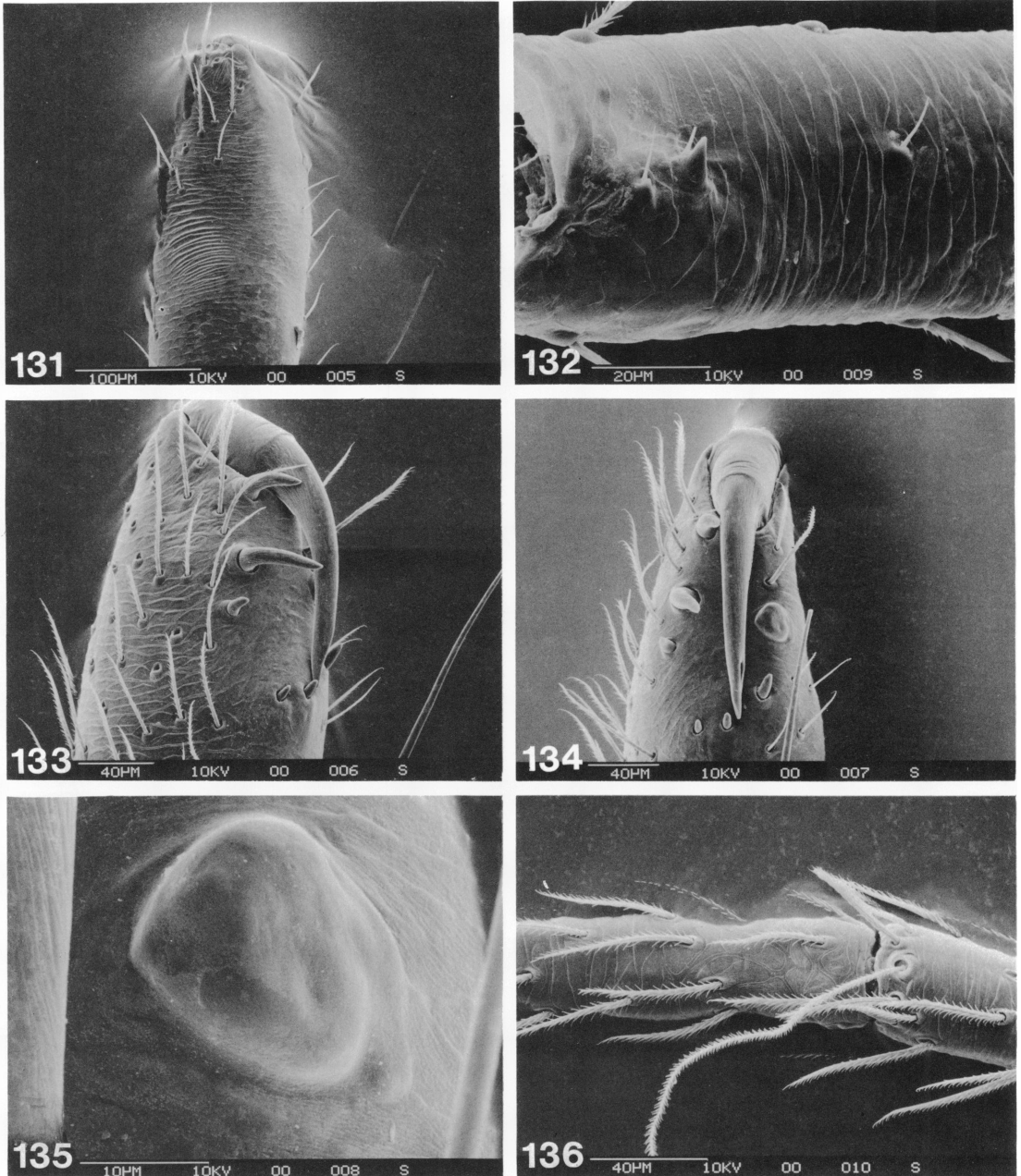
FIGS. 116–124. Mecysmaucheniidae: chelicerae; arrows indicate the gland mound. 116–118. *Mecysmaucheniuss segmentatus* Simon, medial and retrolateral views and enlargement of peg teeth opposite fang tip. 119, 120. *M. eden*, new species, medial and retrolateral views. 121, 123. *Zearchaea fiordensis* Forster, anterior and medial views; note the three peg teeth. 122. *Aotearoa magna* (Forster), medial view. 124. *Zearchaea clypeata* Wilton, prolateral view.



FIGS. 125–130. *Mecysmaucheniiidae*: stridulatory system. 125–128. *Mecysmauchenius segmentatus* Simon. 129, 130. *Zearchaea clypeata* Wilton. 125. Chelicera, posterior view, showing stridulatory file. 126. Stridulatory file, showing grouping of ridges into series. 127. Palpal femur, showing prolateral stridulatory picks. 128, 130. Stridulatory picks; note that picks are modified setal bases. 129. Chelicera, lateral view, showing evenly spaced stridulatory ridges.

of long peg teeth; patch of additional peg teeth opposite fang tip (figs. 116–120, 122); strid-

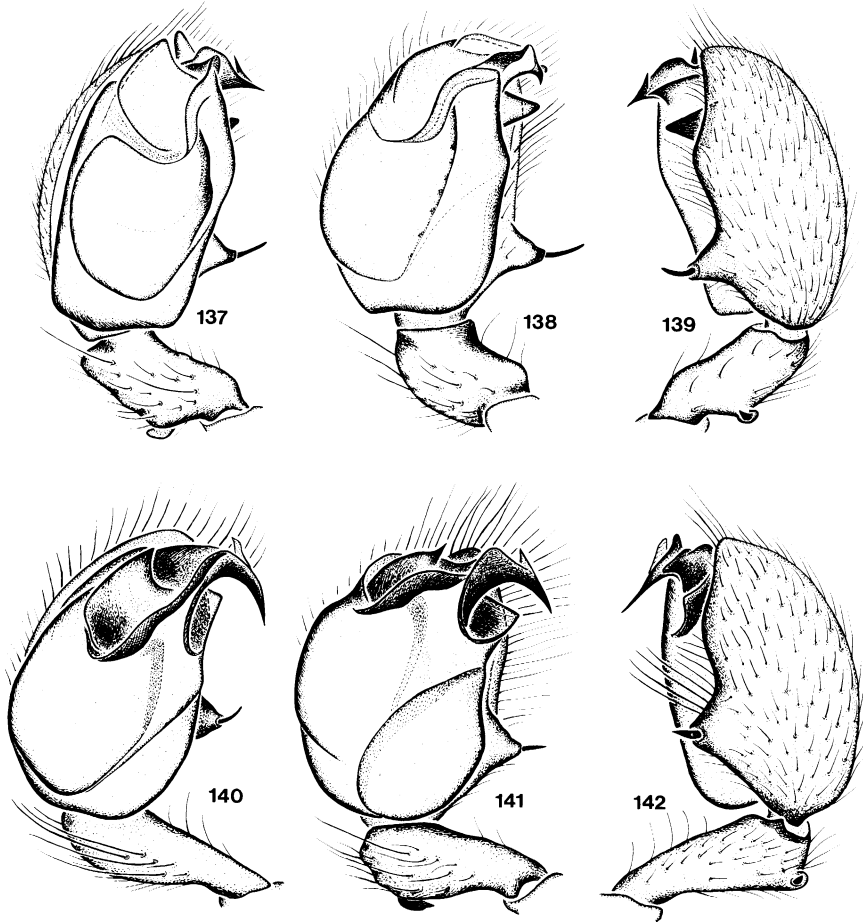
ulatory ridges on outer surface grouped into series (figs. 125, 126). Female palp long, nar-



FIGS. 131–136. *Mecysmaucheniidae*: *Chilarchaea quellon*, new species. 131. Chelicera, oblique lateral view, showing evenly spaced stridulatory ridges. 132. Palpal femur, showing stridulatory picks. 133. Chelicera, anterior view, showing promarginal peg teeth. 134. Chelicera, medial view, showing peg teeth and gland mound. 135. Cheliceral gland mound. 136. Tarsus I; narrowed portion with disturbed scalation is the ring of unsclerotized cuticle.

row (except in *Semysmauchenius*); femur with one or more setal bases elaborated into stridulatory picks (figs. 127, 128).

INCLUDED GENERA: *Mecysmauchenius*, *Mecysmauchenioides*, *Semysmauchenius*, *Mesarchaea*, *Aotearoa*.



FIGS. 137–142. *Mecysmaucheniiidae*: male palp. 137–139. *Mecysmauchenius segmentatus* Simon. 140–142. *M. puyehue*, new species. 137, 140. Prolateral view. 138, 141. Ventral view. 139, 142. Retrolateral view.

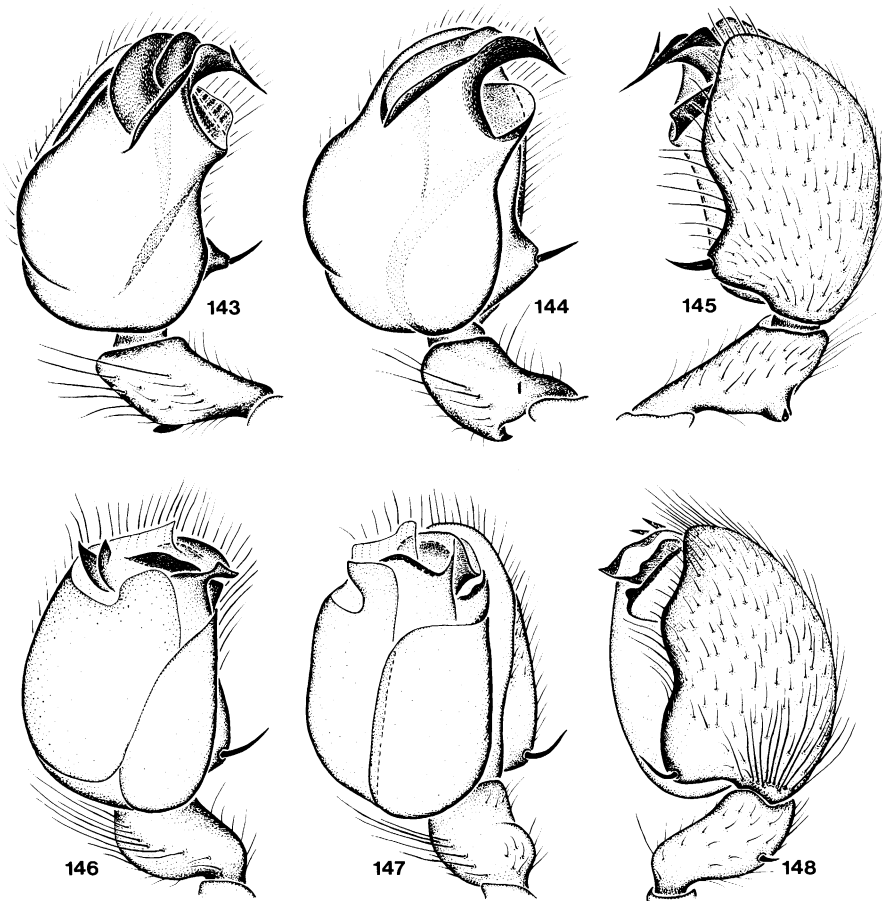
DISTRIBUTION: Southern South America and New Zealand.

MECY SMAUCHENIUS SIMON

Mecysmauchenius Simon, 1884, p. 123 (type species by original designation *Mecysmauchenius segmentatus* Simon).

DIAGNOSIS: *Mecysmauchenius* seems closest to *Mecysmauchenoides* (in both genera males have an articulated spur on the retrolateral edge of the cymbium) but can be distinguished by the presence of at least one denticle on the retrolateral side of the male palpal tibia and by the absence of a scape-shaped lobe on the epigastric region of females.

DESCRIPTION: Relatively large (2.5–7 mm.) *mecysmaucheniiines* with six eyes (AME missing). Abdomen either with pigmented chevrons, almost entirely pigmented, or without pigmentation. Tarsal organ with single erect sensory spine and one or two short sensory lobes arising from wide but shallow cup (figs. 104–109). Female internal genitalia consisting of large number (as many as 100) of small spherical receptacula, each enclosed in secretory tissue, leading into bursal cavity through very long slender ducts (fig. 181); receptacula bilaterally grouped, ducts merging at bursal wall so that only one pair of slits open into bursal cavity (fig. 93); external surface of genitalic region lightly sclerotized but not forming prominent plate; flap present be-



FIGS. 143–148. *Mecysmaucheniiidae*: male palp. 143–145. *Mecysmauchenius termas*, new species. 146–148. *M. chincai*, new species. 143, 146. Prolateral view. 144, 147. Ventral view. 145, 148. Retrolateral view.

hind gonopore but no anterior lobe as in *Mecysmaucheniioides*. Male palp with spur on retromargin of cymbium, one or more denticles on retrolateral surface of tibia (fig. 139).

INCLUDED SPECIES: *M. segmentatus* Simon, *M. gertschi* Zapfe, and 14 new species described below.

DISTRIBUTION: Southern South America.

THE CHEVRON-PATTERNED SPECIES

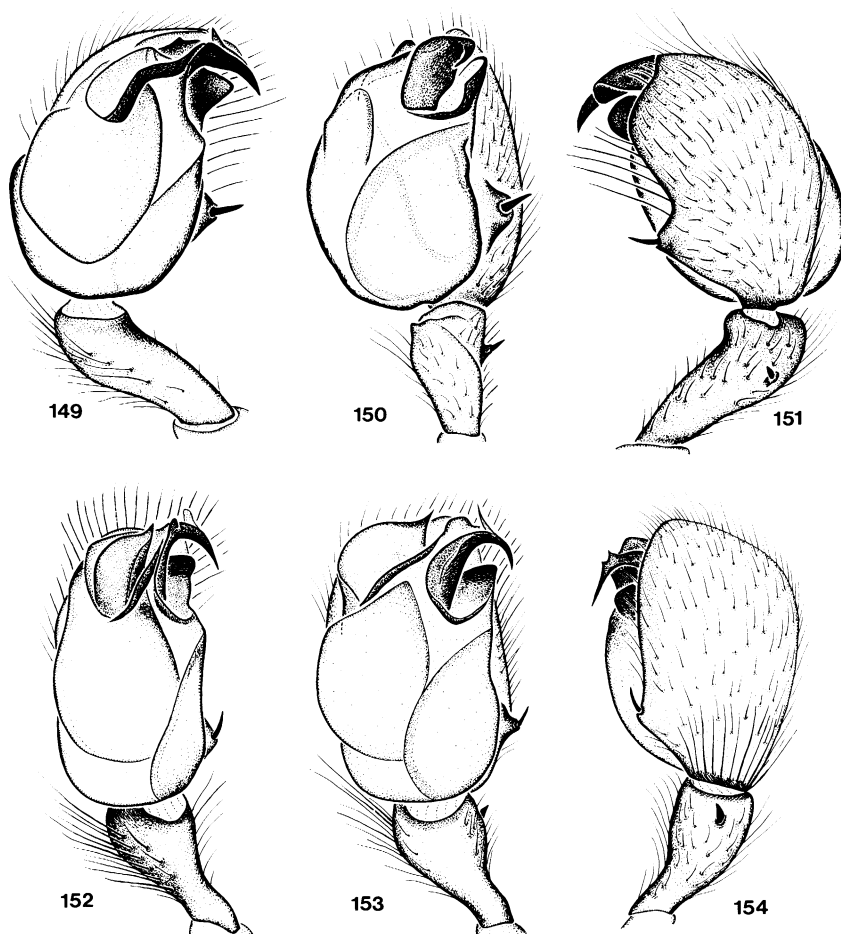
These five species share the classical “mecysmaucheniid” abdominal color pattern of distinctly separated purple chevrons (figs. 76–78). It is doubtful, however, that this color pattern is synapomorphic within the genus, for it recurs in *Aotearoa*. The five species are

grouped here merely for convenience in identification.

Mecysmauchenius segmentatus Simon
 Figures 86, 90, 93, 96, 104–107, 116–118,
 125–128, 137–139, 180, 181, 186, 206

Mecysmauchenius segmentatus Simon, 1884, p. 379, figs. 3–7 (male and female syntypes from Isla Hoste and Isla Hermite, Magallanes, Chile, in Muséum National d’Histoire Naturelle, Paris, not examined); 1887, p. 13, pl. 2, figs. 4, 4a–d; 1895, p. 939, figs. 1009–1011. Tullgren, 1901, p. 220, pl. 3, figs. 5a–d. Canals, 1934, p. 5, figs. 4, 5a, 5b.

DIAGNOSIS: Males can be distinguished from those of *M. puyehue* and *M. termas* by

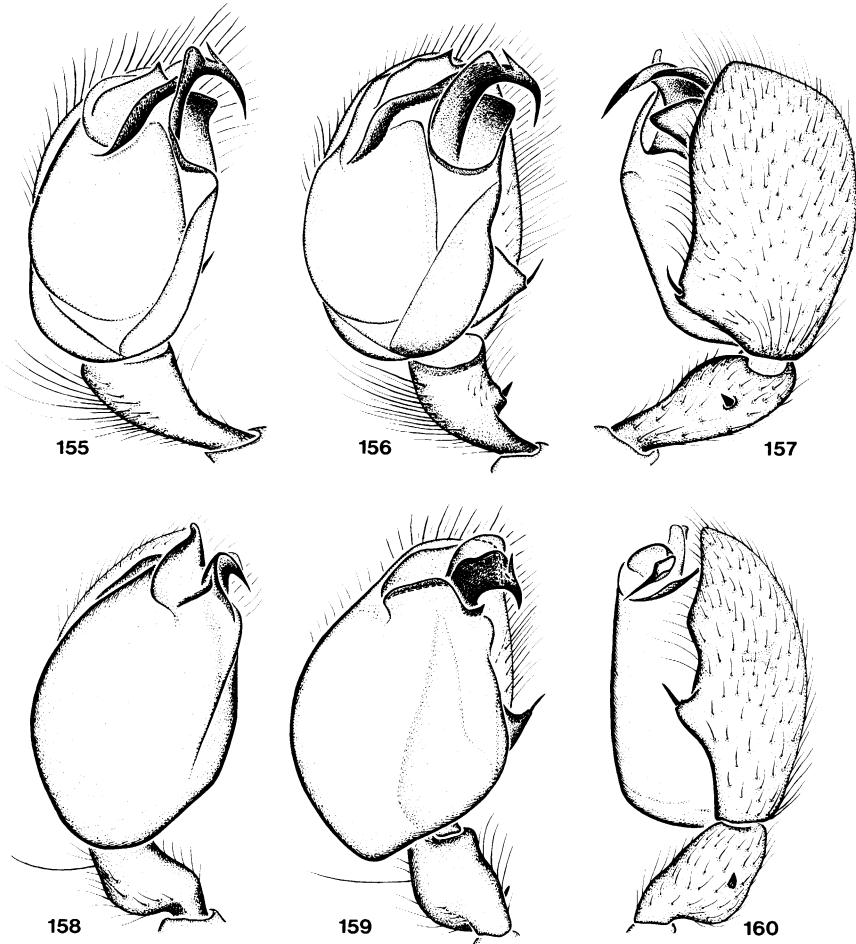


FIGS. 149–154. *Mecysmaucheniiidae*: male palp. 149–151. *Mecysmauchenius eden*, new species. 152–154. *M. newtoni*, new species. 149, 152. Prolateral view. 150, 153. Ventral view. 151, 154. Retrolateral view.

the absence of a median protuberance on the subchelicerar area of the carapace (fig. 86) and from those of *M. chincai* by the more proximally situated denticle on the palpal tibia (fig. 139). Females can be distinguished from those of all other species by the fusion of the two ventral abdominal sclerotized patches into a single transverse area (fig. 186).

FEMALE: Carapace 2.34 long, 1.22 wide, 1.73 high. Abdomen 2.60 long, 1.56 wide. Carapace orange-brown, lightest anteriorly; chelicerae dark orange; sternum and mouth-parts light orange; abdomen pale yellow, dorsum with transverse purple band across anterodorsal surface, connected medially to

series of three prominent purple chevrons extending posteriorly to near spinnerets, followed posteriorly by four smaller purple chevrons diminishing in size posteriorly; venter with rectangular brown sclerotized patch as wide as epigastric region, situated between epigastric groove and spinnerets, occupying second-fifth of distance between them; legs and palpi light orange. Eye diameter ratio, PME:ALE:PLE, 9:9:10; PME separated from each other and from ALE by 3.5 times their diameter. Clypeal height at midpoint almost equal to PME interdistance. Subchelicerar area of carapace without protuberance but with median longitudinal row



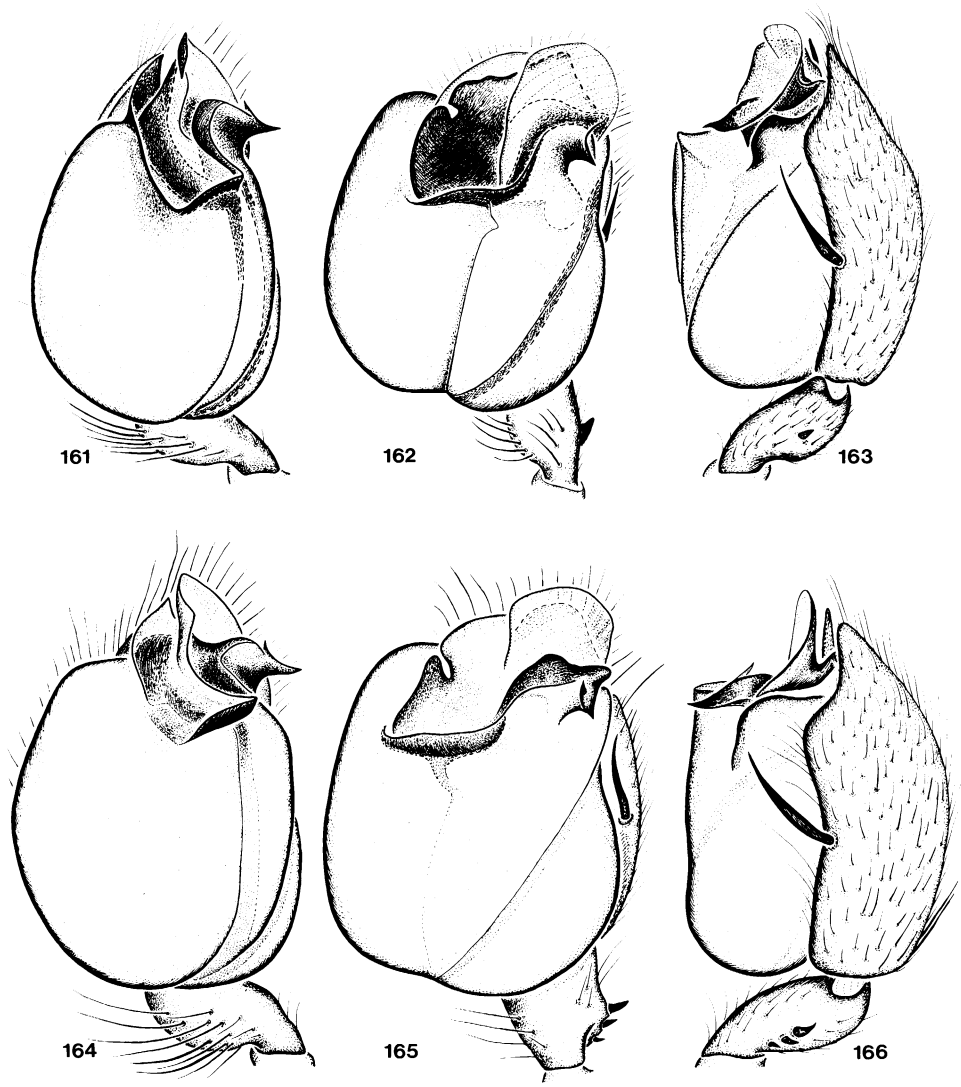
FIGS. 155-160. *Mecysmaucheniidae*: malp. palp. 155-157. *Mecysmauchenius thayerae*, new species. 158-160. *M. canan*, new species. 155, 158. Prolateral view. 156, 159. Ventral view. 157, 160. Retrolateral view.

of about six transverse ridges. Chelicerae 1.40 long, 0.48 wide, stout, posterolateral surface with oblique patch of about four stridulatory ridge series situated at level of fang tip; pro-marginal with external row of eight or nine short peg teeth, internal row of 12 or 13 long peg teeth, and patch of seven to nine short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just distal to last of those teeth, at about three-quarters of fang length, followed proximally by row of about five long, weak bristles; fang evenly curved, tip directed dorsally. Palp with single stridulatory pick proximally on pro-lateral surface of femur, weak prolateral spine at distal tip of tibia, and about seven spines

on tarsus. Endites longer than wide (5:3); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (10:7); sternum longer than wide (3:2).

	I	II	III	IV	Palp
Femur	1.43	1.17	1.04	1.30	0.44
Patella	0.43	0.43	0.52	0.55	0.26
Tibia	1.17	0.85	0.78	1.17	0.52
Metatarsus	1.17	0.82	0.81	1.20	—
Tarsus	0.51	0.48	0.41	0.48	0.56
Total	4.71	3.75	3.56	4.70	1.78

Gonopore with posterior flap and arched sclerotized anterior rim (fig. 186); small receptacula extending far anterior of arch of median receptaculum.

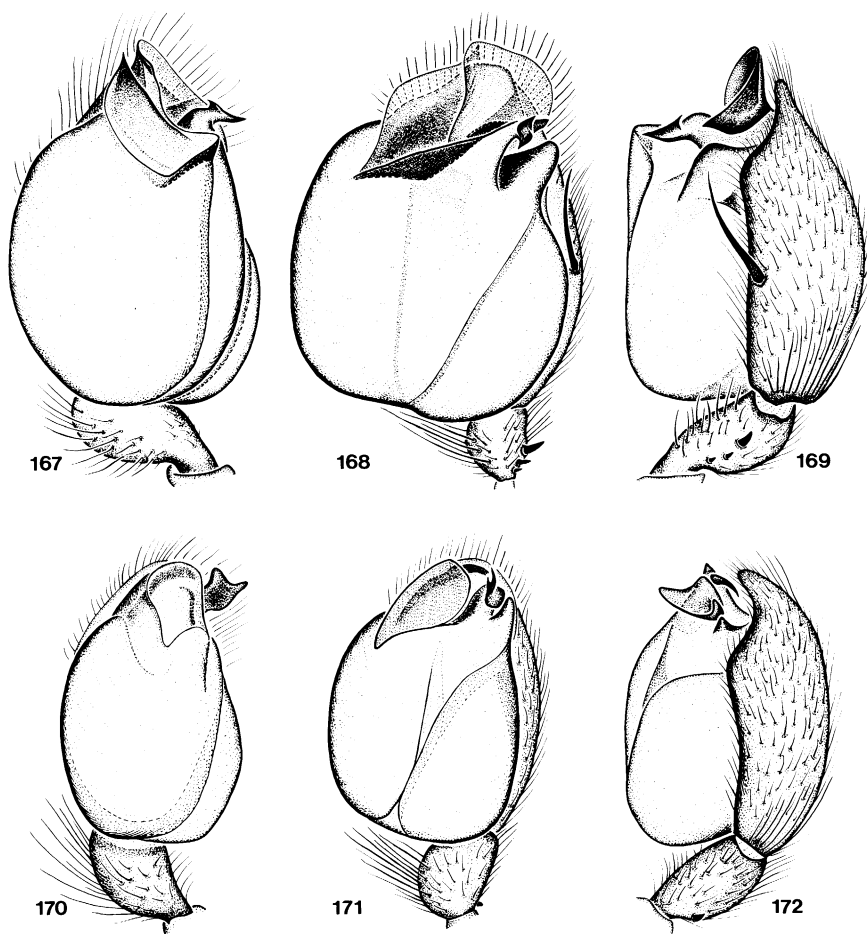


FIGS. 161-166. Mecysmaucheniidae: male palp. 161-163. *Mecysmauchenius chepu*, new species. 164-166. *M. osorno*, new species. 161, 164. Prolateral view. 162, 165. Ventral view. 163, 166. Retro-lateral view.

MALE: As in female, except for the following. Carapace 2.01 long, 1.24 wide, 1.17 high. Abdomen 2.16 long, 1.43 wide. Venter of abdomen without sclerotized patch but with two paramedian purple spots. Eye diameter ratio, 9:8:10; PME separated by three times their diameter from ALE. Chelicerae 1.30 long, 0.42 wide, with about nine weak proximal prolateral bristles.

	I	II	III	IV	Palp
Femur	1.43	1.17	1.04	1.30	0.52
Patella	0.45	0.47	0.41	0.52	0.22
Tibia	1.17	0.82	0.78	1.04	0.29
Metatarsus	1.17	0.80	0.78	1.11	—
Tarsus	0.59	0.48	0.39	0.49	0.65
Total	4.81	3.74	3.40	4.46	1.68

Palp (figs. 137-139) with single denticle at

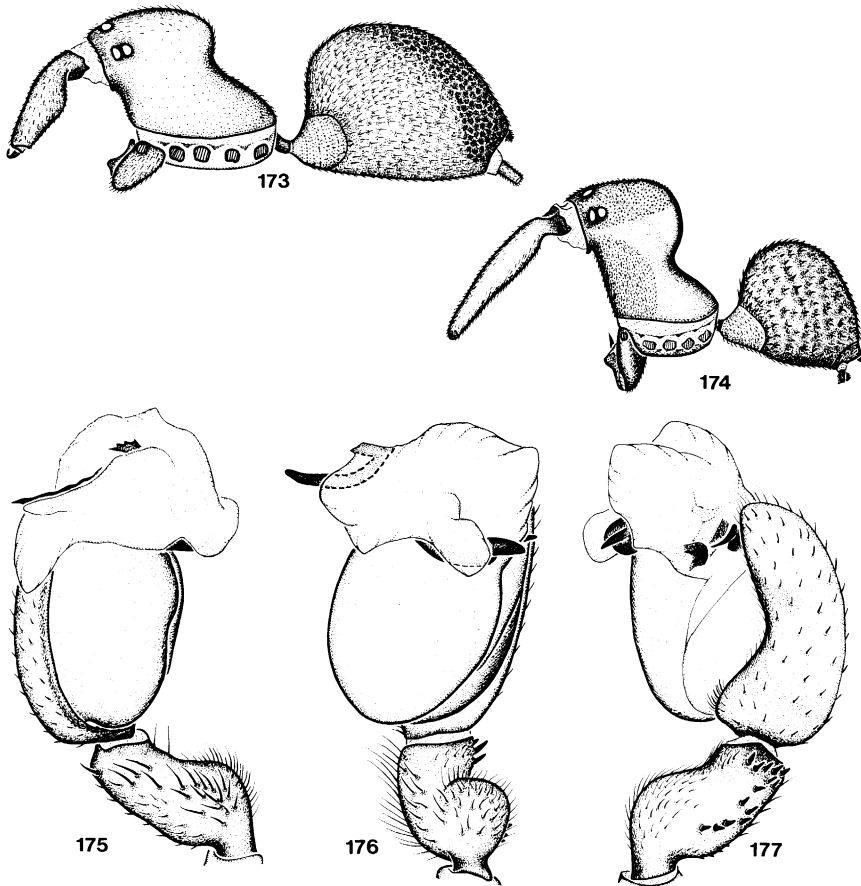


FIGS. 167–172. *Mecysmauchenius* sp.: male palp. 167–169. *Mecysmauchenius villarrica*, new species. 170–172. *Semysmauchenius antillanca*, new species. 167, 170. Prolateral view. 168, 171. Ventral view. 169, 172. Retrolateral view.

apex of distinct protuberance on retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe moderately developed.

MATERIAL EXAMINED: ARGENTINA: *Río Negro*: Cerro Otto, 11 km. W San Carlos de Bariloche, Jan. 14, 1972 (L. Herman, AMNH), lf; Cordón Piltriquitrón, El Bolsón, Apr. 19, 1961 (C. Topal, OMD), lm. *Tierra del Fuego*: no specific locality, Jan. 1933 (M. P. Gomez, AMNH), lf; Lapataia, Feb. 20–23, 1961 (B. Malkin, AMNH), 2m; Ushuaia, Feb. 8–26, 1961 (B. Malkin, AMNH), lm, 6f; Valle Carbajal, Feb. 17, 1961 (B. Malkin, AMNH), 2m. CHILE: *Magallanes*: Bahía Orange, Península Hardy, Isla Hoste, Mar.

9, 1961 (B. Malkin, AMNH), 3f; Estancia Cameron, Isla Grande, Nov. 14–17, 1960 (L. E. Peña, MCZ), 6f; 35 km. SW Estancia Cameron, Isla Grande, elevation 30 m., wet *Nothofagus* forest, Dec. 2, 1966 (E. I. Schlinger, M. E. Irwin, UCB), lm; Isla Grande, northwestern area, Nov. 12–15, 1961 (L. E. Peña, MCZ), lm, lf; 4 km. W Laguna Amarga, Dec. 8, 1966 (E. I. Schlinger, M. E. Irwin, UCB), lf; Puerto Arturo, Isla Grande, Nov. 25–28, 1960 (L. E. Peña, MCZ), 3m, 3f; Puerto Edén, Isla Wellington, Dec. 10–13, 1962 (P. J. Darlington, MCZ), lf; Puerto Williams, Isla Navarino, Mar. 16–17, 1961 (B. Malkin, AMNH), lm, 2f, Dec. 1962–Jan. 1963 (P. J.

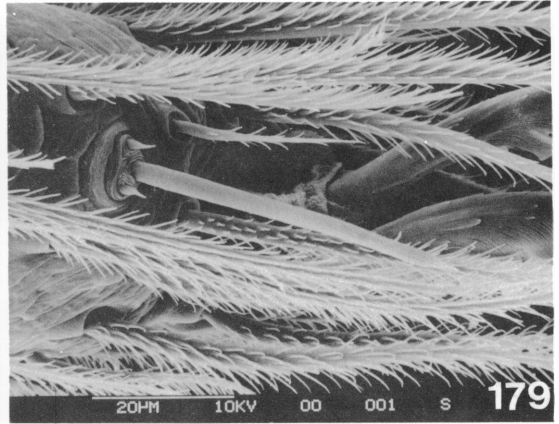
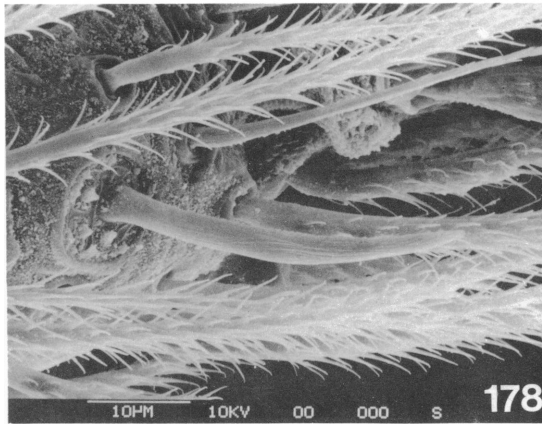


FIGS. 173–177. Mecysmaucheniiidae: male. 173. *Semysmauchenius antillanca*, new species. 174–177. *Mesarchaea bellavista*, new species. 173, 174. Carapace and abdomen, lateral view. 175–177. Palp with distal haematodocha expanded and displacing terminal sclerites, prolateral, ventral, and retrolateral views.

Darlington, MCZ), lm, lf, July 21, 1963 (T. Cekalovic, AMNH), lm; Río Blanco, Jan. 1, 1963 (T. Cekalovic, AMNH), lf; Río Rubens, Nov. 30–Dec. 3, 1962 (P. J. Darlington, MCZ), 3m, 2f; Río Santa María, Isla Grande, Jan. 8, 1977 (T. Cekalovic, AMNH), lf; Rus-sphen, Isla Grande, Nov. 17–21, 1960 (L. E. Peña, MCZ, FMNH), 4m, 8f; 11.8 km. NW Russphen, Isla Grande, elevation 300 m., dry *Nothofagus* forest, Dec. 1, 1966 (E. I. Schlinger, M. E. Irwin, UCB), lf; Vicuña, Isla Grande, elevation 300 m., wet *Nothofagus* forest, Nov. 30, 1966 (E. I. Schlinger, M. E. Irwin, UCB), 3f. *Malleco*: 6.5 km. E Malalcahuello, elevation 1080 m., *Nothofagus dombeyi* and *Chusquea*, window trap, Dec.

13–31, 1982 (A. Newton, M. Thayer, AMNH), lm; 14 km. E Malalcahuello, elevation 1570 m., *Nothofagus pumilio* and *Arcaucaria* forest, window and baited pitfall traps, Dec. 13–31, 1982 (A. Newton, M. Thayer, AMNH), 5m, 3f. *Osorno*: Volcán Casa Blanca, Parque Nacional Puyehue, elevation 1130–1180 m., pitfall traps above tree line, Dec. 20–25, 1982 (A. Newton, M. Thayer, AMNH), 2m. FALKLAND ISLANDS: *East Falkland*: Malo River, Dec. 6, 1974 (S. Coscarón, AMNH), lf; Stanley, Dec. 5, 1974 (S. Coscarón, AMNH), lm.

DISTRIBUTION: Magallanic Chile, adjacent Argentina north through Patagonia and higher elevations of Chilean Andes, and the Falk-



FIGS. 178, 179. *Mecysmaucheniiidae*: tarsal organ from anterior legs of male. 178. *Semysmauchenius antillanca*, new species. 179. *Mesarchaea bellavista*, new species.

land Islands. The specimens from more northern localities in Chile reported and illustrated by Brignoli (1980a, p. 32, figs. 1–7) as this species may well belong to other taxa instead.

***Mecysmauchenius fernandez*, new species**
Figure 187

Mecismauchenius segmentatus (misidentification): Berland, 1924, pp. 423, 433 (*lapsus*).

TYPE: Female holotype from an elevation of 200–250 m. on the Camote side, Valle Anson, Plazoletto de Yunque, Isla Más a Tierra, Islas Juan Fernández (April 1–28, 1962; B. Malkin), deposited in AMNH.

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

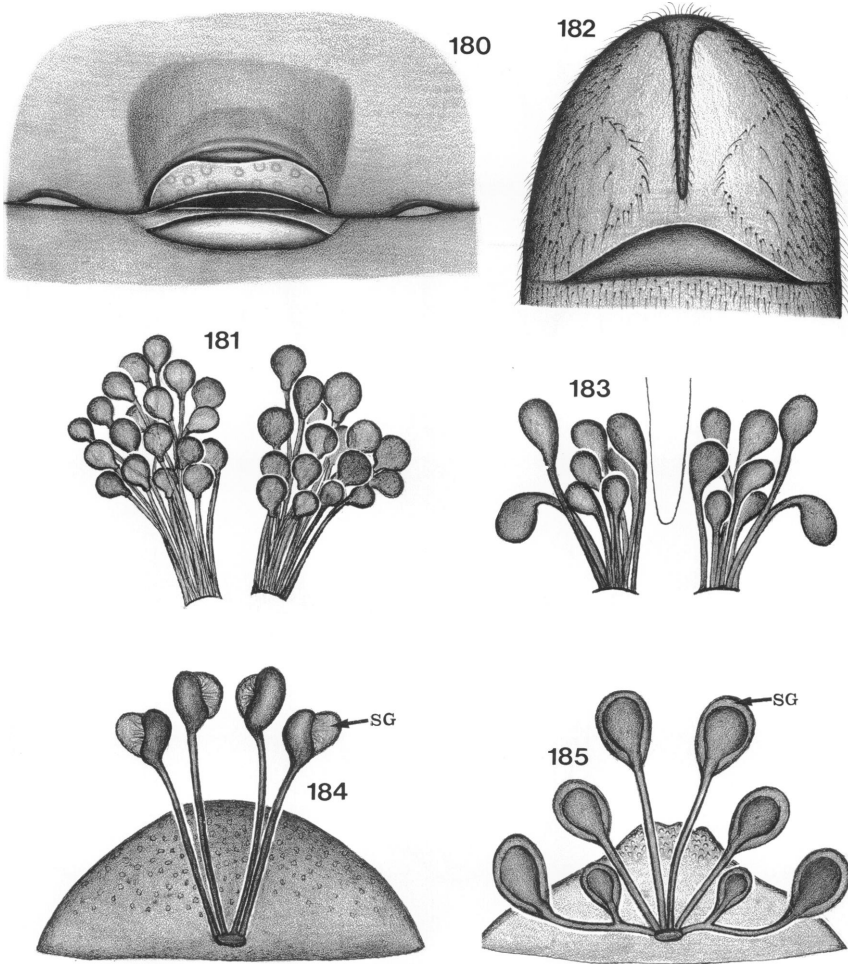
DIAGNOSIS: Females can be distinguished from those of *M. puyehue* and *M. termas* by the absence of a median protuberance on the subchelicerar area of the carapace and from those of *M. segmentatus* by the presence of two separate ventral abdominal sclerotized patches and the more angular sclerotized rim of the epigastric region (fig. 187).

FEMALE: Carapace 2.30 long, 1.28 wide, 1.24 high. Abdomen 2.95 long, 2.05 wide. Coloration as in *M. segmentatus* except that venter of abdomen has two brown sclerotized patches separated by over half their width. Eye diameter ratio, PME:ALE:PLE, 11:13:12; PME separated by four times their diameter, by three times their diameter from

ALE. Clypeal height at midpoint three-fourths of PME interdistance. Subchelicerar area of carapace without protuberance but with median longitudinal row of about nine transverse ridges. Chelicerae 1.49 long, 0.54 wide, stout, posterolateral surface with oblique patch of about four stridulatory ridge series situated at level of fang tip; promargin with external row of 12 or 13 short peg teeth, internal row of 12 or 13 long peg teeth, and patch of eight short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just proximal to last of those teeth, at about three-fourths of fang length, followed proximally by row of about nine long, weak bristles; fang evenly curved, tip directed dorsally. Palp with single stridulatory pick proximally on prolateral surface of femur, weak prolateral spine at distal tip of tibia, and about eight spines on tarsus. Endites longer than wide (2:1); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (4:3); sternum longer than wide (4:3).

	I	II	III	IV	Palp
Femur	1.56	1.22	1.18	1.53	0.53
Patella	0.46	0.47	0.40	0.47	0.22
Tibia	1.35	0.95	0.82	1.12	0.50
Metatarsus	1.31	0.86	0.83	1.30	—
Tarsus	0.54	0.43	0.34	0.47	0.50
Total	5.22	3.93	3.57	4.89	1.75

Gonopore with posterior flap and angular



FIGS. 180–185. *Mecysmaucheniidae*: female epigastric region and internal genitalia; secretory glands (SG) associated with the receptacula are shown in the bottom figures. 180, 181. *Mecysmauchenius segmentatus* Simon. 182, 183. *Mecysmauchenioides nordenskjoldi* (Tullgren). 184. *Aotearoa magna* (Forster). 185. *Zearchaea fiordensis* Forster.

sclerotized anterior rim (fig. 187); most small receptacula posterior of arch of median receptaculum.

MALE: Unknown.

MATERIAL EXAMINED: One female taken with the holotype.

DISTRIBUTION: Known only from the Juan Fernandez Islands.

***Mecysmauchenius puyehue*, new species**

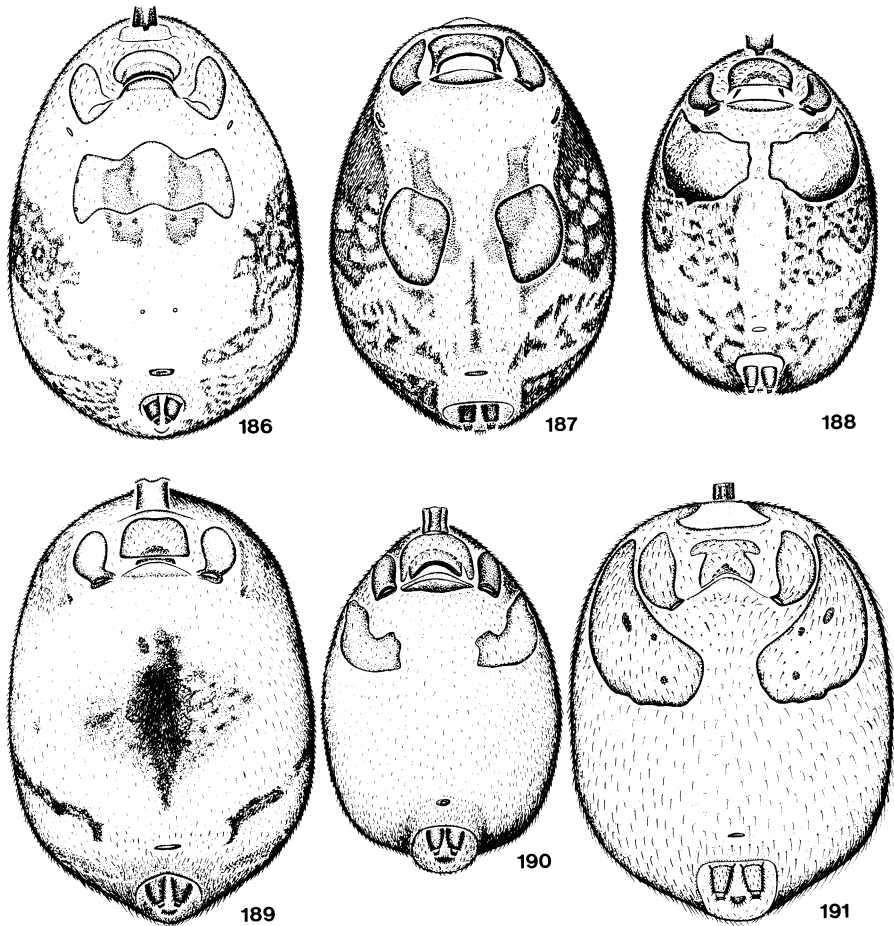
Figures 140–142, 188

TYPES: Male holotype and female paratype from Berlese sample of concentrated forest

litter and moss taken at an elevation of 180 m. at Termas de Puyehue, Osorno, Chile (November 24, 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: Males can be distinguished from those of *M. segmentatus* and *M. chin-cay* by the presence of a median protuberance on the subchelicerar area of the carapace (as in fig. 85) and from those of *M. termas* by the more distally situated denticle on the palpal tibia (fig. 142). Females can be distinguished from those of the other chevron-pat-

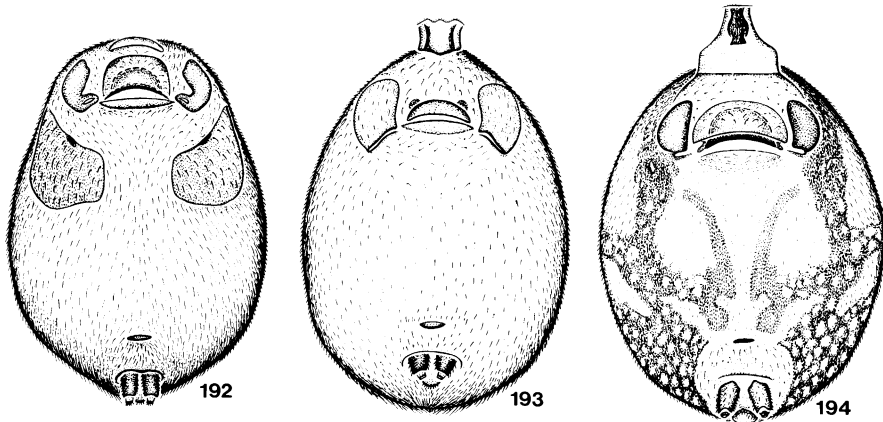


FIGS. 186–191. *Mecysmaucheniiidae*: female abdomen, ventral view. 186. *Mecysmauchenius segmentatus* Simon. 187. *M. fernandez*, new species. 188. *M. puyehue*, new species. 189. *M. termas*, new species. 190. *M. eden*, new species. 191. *M. newtoni*, new species.

terned species by the presence of paired and anteriorly situated ventral abdominal sclerotized patches (fig. 188).

FEMALE: Carapace 1.86 long, 0.99 wide, 0.86 high. Abdomen 1.55 long, 1.23 wide. Carapace reddish brown, lightest anteriorly; chelicerae dark brown; sternum and mouthparts light brown; abdomen pale yellow, dorsum with transverse purple band across anterodorsal surface, connected medially to series of three purple chevrons extending posteriorly to near spinnerets, followed posteriorly by three smaller purple chevrons diminishing in size posteriorly, spaces between all chevrons with scattered purple pigment; venter with pair of large, bulging brown scler-

otized patches reaching to half of abdominal height, situated between epigastric groove and midlength; legs and palpi light brown. Eye diameter ratio, PME:ALE:PLE, 8:9:9; PME separated from each other and from ALE by three times their diameter. Clypeal height at midpoint equal to PME interdistance. Subcheliceral area of carapace with protuberance at about half its height. Chelicerae 1.15 long, 0.38 wide, stout, prolateral surface with oblique patch of about four stridulatory ridge series situated proximal to level of fang tip; promargin with external row of 12 or 14 short peg teeth, internal row of 11 or 12 peg teeth (of which four most proximal are much shorter than others), and patch of about six short



FIGS. 192–194. Mecysmaucheniidae: female abdomen, ventral view. 192. *Mecysmauchenius chacamó*, new species. 193. *M. canan*, new species. 194. *M. chepu*, new species.

peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just distal to last of those teeth, at about three-fourths of fang length, followed proximally by about four long, strong bristles; fang evenly curved, tip directed obliquely. Palp with single stridulatory pick proximally on prolateral surface of femur, weak prolateral spine at distal tip of tibia, and about eight spines on tarsus. Endites longer than wide (11:6); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (7:5); sternum longer than wide (15:11).

	I	II	III	IV	Palp
Femur	1.12	0.94	0.82	1.09	0.46
Patella	0.35	0.35	0.31	0.39	0.17
Tibia	0.91	0.63	0.54	0.89	0.47
Metatarsus	0.84	0.59	0.54	0.84	—
Tarsus	<u>0.45</u>	<u>0.31</u>	<u>0.34</u>	<u>0.45</u>	<u>0.44</u>
Total	3.67	2.82	2.55	3.66	1.54

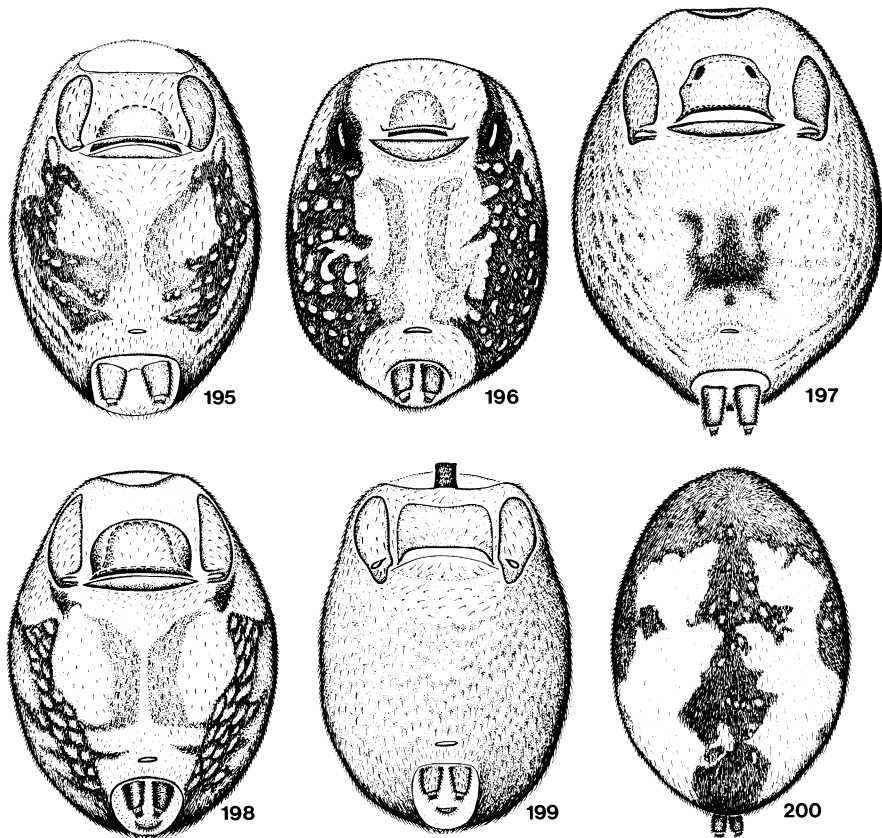
Gonopore with posterior flap and sclerotized, tent-shaped anterior rim (fig. 188); small receptacula extending anterior of arch of median receptaculum only at sides.

MALE: As in female, except for the following. Carapace 2.16 long, 0.97 wide, 0.99 high. Abdomen 1.23 long, 1.05 wide. Venter of abdomen without sclerotized patches. PME separated by 2.5 times their diameter from ALE. Clypeal height at midpoint slightly less than PME interdistance. Chelicerae 1.20 long, 0.38 wide.

	I	II	III	IV	Palp
Femur	1.15	0.96	0.85	1.07	0.47
Patella	0.36	0.34	0.31	0.43	0.13
Tibia	0.97	0.73	0.61	0.86	0.34
Metatarsus	0.85	0.54	0.63	0.90	—
Tarsus	<u>0.38</u>	<u>0.31</u>	<u>0.29</u>	<u>0.35</u>	<u>0.50</u>
Total	3.71	2.88	2.69	3.61	1.44

Palp (figs. 140–142) with single denticle at apex of distinct protuberance near distal tip of retrolateral surface of elongated tibia; retrolateral cymbial spur-bearing lobe well developed.

MATERIAL EXAMINED: CHILE: *Cautín*: Volcán Villarrica, elevation 1120 m., *Nothofagus dombeyi*, *Saxegothea*, and *Drimys*, window trap, Dec. 15–29, 1982 (A. Newton, M. Thayer, AMNH), lm. *Osorno*: 4.1 km. E Anticura, Parque Nacional Puyehue, elevation 430 m., Valdivian rainforest, Berlese leaf and log litter, Dec. 16–26, 1982 (A. Newton, M. Thayer, AMNH), lf; Antillanca road, Parque Nacional Puyehue, elevation 690 m., Valdivian rainforest, window trap, Dec. 18–24, 1982 (A. Newton, M. Thayer, AMNH), 2m, elevation 845 m., *Nothofagus-Saxegothea* forest, baited pitfall trap, Dec. 18–24, 1982 (A. Newton, M. Thayer, AMNH), lf; Termas de Puyehue, elevation 180 m., Berlese concentrated forest litter and moss, Nov. 24, 1981 (N. I. Platnick, R. T. Schuh, AMNH), 2m, lf (including types), elevation 460 m., Berlese concentrated forest litter and moss,



FIGS. 195–200. Mecysmauchenidae: female abdomen. 195. *Mecysmauchenius chapo*, new species. 196. *M. osorno*, new species. 197. *M. victoria*, new species. 198. *M. gertschi* Zapfe. 199. *Semysmauchenius antillanca*, new species. 200. *Chilarchaea quellon*, new species. 195–199. Ventral view. 200. Dorsal view.

Nov. 25, 1981 (N. I. Platnick, R. T. Schuh, AMNH), 1m, 3f.

DISTRIBUTION: Known only from Cautín and Osorno, Chile.

***Mecysmauchenius termas*, new species**

Figures 143–145, 189

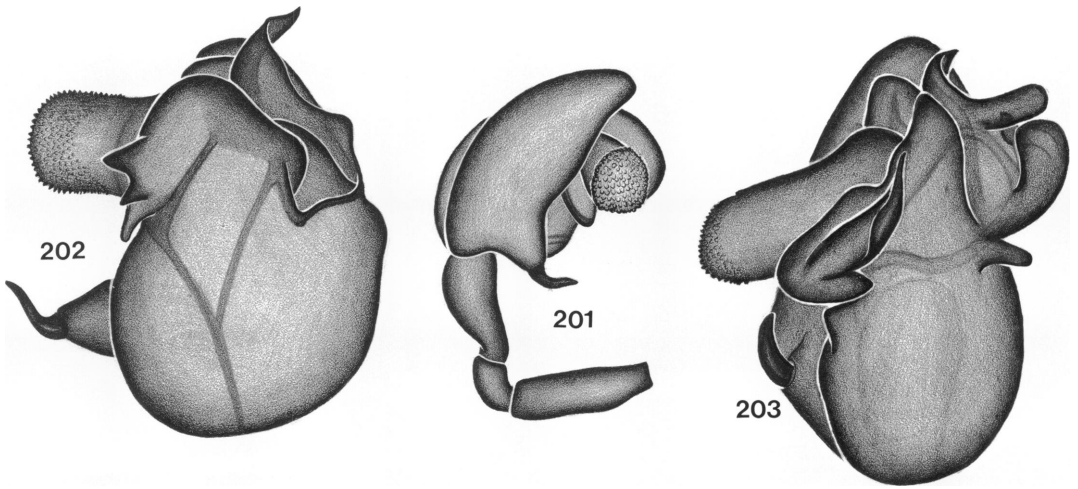
TYPES: Male holotype and female paratype from a wet forest at an elevation of 460 m. at Termas de Puyehue, Osorno, Chile (November 25, 1981; N. I. Platnick and R. T. Schuh), deposited in AMNH.

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

DIAGNOSIS: Males can be distinguished from those of *M. segmentatus* and *M. chinca* by the presence of a median protuberance on the subchelicerar area of the carapace (as in fig. 85) and from those of *M. puyehue* by

the more proximally situated denticle on the palpal tibia (fig. 145). Females can be distinguished from those of the other chevron-patterned species by the absence of ventral abdominal sclerotized patches (fig. 189).

FEMALE: Carapace 1.78 long, 0.90 wide, 0.90 high. Abdomen 1.81 long, 1.31 wide. Carapace reddish brown, lightest medially; chelicerae orangish brown; sternum and mouthparts light brown; abdomen pale yellow, dorsum with three widely spaced purple chevrons reaching around sides and four closely spaced posterior chevrons, venter with median transverse purple stripe but without sclerotized patches; legs and palpi light brown. Eye diameter ratio, PME:ALE:PLE, 10:9:10; PME separated by 2.5 times their diameter, by 1.5 times their diameter from ALE. Clypeal height at midpoint equal to PME interdis-



FIGS. 201–203. *Mecysmauchenioidea*: *Mecysmauchenioides nordenskjoldi* (Tullgren), right male palp. 201. Retrolateral view. 202. Ventral view. 203. Prolateroventral view.

tance. Subchelicerar area of carapace with protuberance at about half its height. Chelicerae 0.96 long, 0.27 wide, moderately stout, posterolateral surface with oblique patch of about five stridulatory ridge series situated at level of fang tip; promargin with external row of eight or nine short peg teeth, internal row of eight or nine peg teeth (of which four most proximal are much shorter than others), and patch of four or five short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just distal to last of those teeth, at about five-sixths of fang length, followed proximally by about four long, weak bristles; fang evenly curved, tip directed dorsally. Palp with single stridulatory pick proximally on prolateral surface of femur, weak prolateral spine at distal tip of tibia, and about seven spines on tarsus. Endites longer than wide (3:2); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (3:2); sternum longer than wide (5:4).

	I	II	III	IV	Palp
Femur	0.91	0.72	0.68	0.96	0.36
Patella	0.22	0.25	0.29	0.32	0.16
Tibia	0.79	0.59	0.49	0.77	0.32
Metatarsus	0.67	0.49	0.49	0.79	—
Tarsus	0.38	0.25	0.25	0.33	0.35
Total	2.97	2.30	2.20	3.17	1.19

Gonopore with posterior flap, anterior rim partially covered by sclerotized plate (fig. 189); small receptacula extending far anterior of arch of median receptaculum.

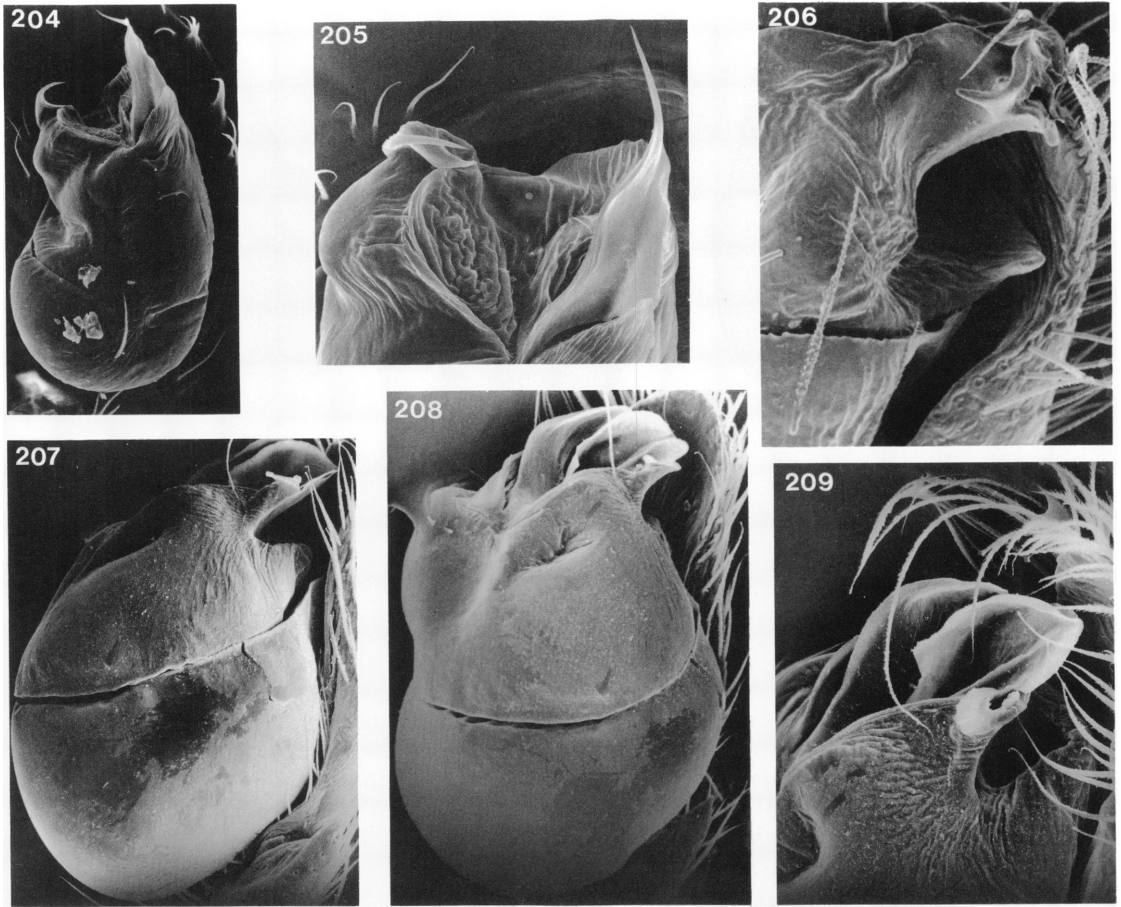
MALE: As in female, except for the following. Carapace 1.62 long, 0.85 wide, 0.85 high. Abdomen 1.26 long, 1.05 wide. Chelicerae 0.85 long, 0.23 wide.

	I	II	III	IV	Palp
Femur	0.89	0.70	0.68	0.87	0.26
Patella	0.25	0.24	0.22	0.29	0.14
Tibia	0.76	0.54	0.48	0.68	0.22
Metatarsus	0.65	0.49	0.48	0.74	—
Tarsus	0.38	0.23	0.22	0.33	0.47
Total	2.93	2.20	2.08	2.91	1.09

Palp (figs. 143–145) with single denticle at apex of distinct protuberance on retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe moderately developed.

MATERIAL EXAMINED: Two males and five females taken with the types, and six males and two females collected by hand sorting and Berlese sampling of concentrated forest litter and moss taken at an elevation of 180 m. at the type locality (November 24, 1981; N. I. Platnick and R. T. Schuh), all in AMNH.

DISTRIBUTION: Known only from Osorno, Chile.



FIGS. 204–209. Mecysmaucheniidae: male palp. 204, 205. *Zearchaea clypeata* Wilton, ventral and distal views. 206. *Mecysmauchenius segmentatus* Simon, prolateral view of distal portion. 207–209. *Aotearoa magna* (Forster), prolateral and ventral views and enlargement of distal portion.

***Mecysmauchenius chincay*, new species**

Figures 146–148

TYPE: Male holotype taken in a Berlese sample of leaf and log litter in a secondary Valdivian forest at an elevation of 50 m. at Chincay, 10 km. east of Bahía Mansa, Osorno, Chile (December 21, 1982; A. Newton and M. Thayer), deposited in AMNH.

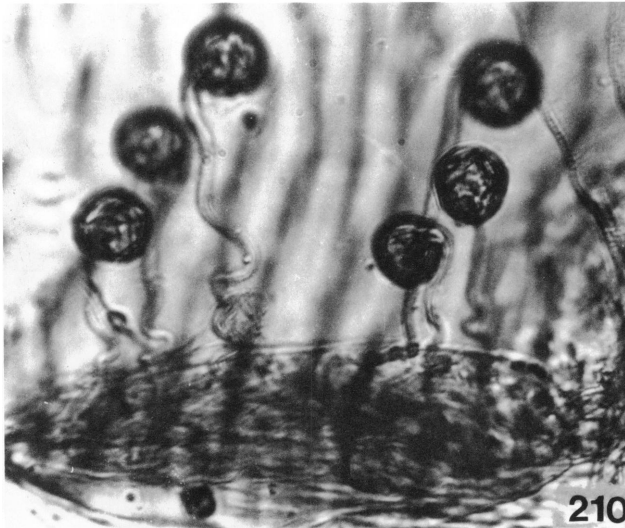
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be distinguished from those of *M. puyehue* and *M. termas* by the absence of a median protuberance on the subchelicerar area of the carapace (as in fig. 86) and from those of *M. segmentatus* by the

more distally situated denticle on the palpal tibia (fig. 148).

FEMALE: Unknown.

MALE: Carapace 0.99 long, 0.54 wide, 0.49 high. Abdomen 0.88 long, 0.68 wide. Carapace reddish brown, lightest medially; chelicerae brown; sternum and mouthparts light yellowish brown; abdomen pale yellow, dorsum with transverse reddish purple band across anterodorsal surface, almost connected medially to series of three narrow reddish purple chevrons extending posteriorly to near spinnerets, followed posteriorly by two smaller reddish purple chevrons; venter otherwise with few scattered pigment spots, without sclerotized patches; legs and palpi



FIGS. 210, 211. *Mecysmaucheniidae*: *Chilarchaea quellon*, new species, internal female genitalia. 210. Dorsal view. 211. Enlargement of receptacula.

light brown. Eye diameter ratio, PME:ALE: PLE, 6:6:5; PME separated from each other and from ALE by twice their diameter. Clypeal height at midpoint greater than PME interdistance; teratological seventh eye present in front of right PME. Subcheliceral area of carapace without protuberance but covered with tubercles. Chelicerae 0.54 long, 0.18 wide, slender, posterolateral surface with oblique patch of about three stridulatory ridge series situated at level of fang tip; promargin with external row of nine short peg teeth, internal row of eight or nine long peg teeth, and patch of eight or nine short peg teeth extending around tip of fang groove to retro-margin; cheliceral gland mound just proximal to last of those teeth, at about five-sixths of fang length, followed proximally by about six long, weak bristles; fang evenly curved, tip directed dorsally. Palp with single stridulatory pick proximally on prolateral surface of femur, with stiff bristles but no spines on tibia and tarsus. Endites longer than wide (14:

11); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (4:3); sternum longer than wide (3:2).

	I	II	III	IV	Palp
Femur	0.76	0.54	0.47	0.67	0.26
Patella	0.23	0.20	0.20	0.21	0.11
Tibia	0.61	0.43	0.36	0.54	0.14
Metatarsus	0.48	0.33	0.25	0.50	—
Tarsus	<u>0.42</u>	<u>0.27</u>	<u>0.24</u>	<u>0.25</u>	<u>0.35</u>
Total	2.50	1.77	1.52	2.17	0.86

Palp (figs. 146–148) with single denticle on retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe moderately developed.

MATERIAL EXAMINED: Only the holotype.

DISTRIBUTION: Known only from Osorno, Chile.

THE UNPATTERNED SPECIES

These five species resemble *Mecysmauchenioides* in being totally devoid of an ab-

dominal color pattern. All but *M. canan* have a median protuberance on the subchelicerar area of the carapace (as in fig. 85), suggesting that they may be allied with *M. puyehue* and *M. termas* despite the differences in coloration. Similarly, the known females other than *M. canan* have ventral abdominal sclerotized patches, as are also found in females of *M. segmentatus*, *M. fernandez*, and *M. puyehue*. Hence both characters cannot be considered synapomorphies without invoking some homoplasy in *M. puyehue*.

***Mecysmauchenius eden*, new species**

Figures 85, 91, 97, 98, 119,
120, 149–151, 190

TYPES: Male holotype and female paratype from Puerto Edén, Isla Wellington, Magallanes, Chile (December 7–9, 1962; P. J. Darlington), deposited in MCZ.

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

DIAGNOSIS: Males can be distinguished from those of *M. newtoni*, *M. thayerae*, and *M. canan* by having the cymbial spur directed ventrally rather than distally (figs. 150, 151). Females can be recognized by the widely separated, sinuous ventral abdominal sclerotized patches and the shape of the sclerotized anterior rim of the gonopore (fig. 190).

FEMALE: Carapace 2.47 long, 1.30 wide, 1.30 high. Abdomen 2.47 long, 1.82 wide. Carapace reddish brown, lightest medially; chelicerae reddish brown; sternum and mouthparts light orange; abdomen pale yellow, without pigment markings but venter with pair of widely separated brown sclerotized patches behind epigastric groove; legs and palpi pale orange. Eye diameter ratio, PME:ALE:PLE, 9:9:10; PME separated from each other and from ALE by three times their diameter. Clypeal height at midpoint slightly greater than PME interdistance. Subchelicerar area of carapace with large pointed protuberance at about half its height. Chelicerae 1.26 long, 0.59 wide, stout, posterolateral surface with oblique patch of about six stridulatory ridge series situated at level of fang tip; promargin with external row of 11 or 12 short peg teeth, internal row of 13 or 14 long peg teeth, and patch of nine or 10 short peg

teeth extending around tip of fang groove to retromargin; cheliceral gland mound just distal to last of those teeth, at about two-thirds of fang length, followed proximally by about seven long, weak bristles; fang sinuous at tip, directed obliquely. Palp with single stridulatory pick proximally on prolateral surface of femur, weak prolateral spine at distal tip of tibia, and about six spines on tarsus. Endites longer than wide (12:7); labrum with median ventral and large paired lateral dorsal protuberances; labium wider than long (5:4); sternum longer than wide (16:11).

	I	II	III	IV	Palp
Femur	1.43	1.11	1.04	1.33	0.65
Patella	0.52	0.45	0.52	0.61	0.32
Tibia	1.17	0.84	0.69	1.10	0.55
Metatarsus	1.12	0.73	0.80	1.17	—
Tarsus	<u>0.61</u>	<u>0.45</u>	<u>0.41</u>	<u>0.52</u>	<u>0.58</u>
Total	4.85	3.58	3.46	4.73	2.10

Gonopore with posterior flap and weakly rounded, sclerotized anterior rim (fig. 190); small receptacula extending only slightly anterior of arch of median receptaculum.

MALE: As in female, except for the following. Carapace 2.34 long, 1.21 wide, 1.48 high. Abdomen 1.90 long, 1.38 wide. Venter of abdomen with sclerotized patches reduced to tiny strips. Chelicerae 1.56 long, 0.46 wide.

	I	II	III	IV	Palp
Femur	1.39	1.06	1.08	1.30	0.61
Patella	0.46	0.46	0.46	0.58	0.21
Tibia	1.17	0.84	0.71	1.04	0.35
Metatarsus	1.11	0.71	0.71	1.14	—
Tarsus	<u>0.58</u>	<u>0.39</u>	<u>0.41</u>	<u>0.50</u>	<u>0.62</u>
Total	4.71	3.45	3.37	4.56	1.79

Palp (figs. 149–151) with single denticle at apex of distinct protuberance near distal end of retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe moderately developed.

MATERIAL EXAMINED: Two females taken with the types and one female taken at the type locality December 13–15, 1962, by P. J. Darlington (MCZ).

DISTRIBUTION: Known only from Isla Wellington, Magallanes, Chile.

Mecysmauchenius newtoni, new species

Figures 152–154, 191

YPES: Male holotype and female paratype taken in a window trap in a Valdivian rain-forest at an elevation of 310 m. at Lago Chapo, 13.5 km. east of Correntoso, Llanquihue, Chile (December 16–27, 1982; A. Newton and M. Thayer), deposited in AMNH.

ETYMOLOGY: The specific name is a patronym in honor of Dr. Alfred F. Newton, Jr., one of the collectors of the holotype and many other fascinating spiders.

DIAGNOSIS: Males can be distinguished from those of *M. eden* by the distally directed cymbial spur (figs. 153, 154), from those of *M. canan* by the presence of a median protuberance on the subchelicerar area of the carapace (as in fig. 85), and from those of *M. thayerae* by having the subchelicerar protuberance blunt rather than sharply pointed. Females can be distinguished from those of *M. eden*, *M. chacamo*, and *M. canan* by the closely approximate ventral abdominal sclerotized patches (fig. 191).

FEMALE: Carapace 1.87 long, 0.99 wide, 1.16 high. Abdomen 1.91 long, 1.30 wide. Coloration as in *M. eden* except that ventral abdominal sclerotized patches are closer together. Eye diameter ratio, PME:ALE:PLE, 8:7:10; PME separated from each other by almost four times, from ALE by three times, their diameter. Clypeal height at midpoint only two-thirds of PME interdistance. Subchelicerar area of carapace with blunt, oblique protuberance at about half its height. Chelicerae 1.12 long, 0.43 wide, stout, posterolateral surface with oblique patch of about six stridulatory ridge series situated at level of fang tip; promargin with external row of eight or nine short peg teeth, internal row of 12 peg teeth, of which three or four most proximal are much smaller than others, and patch of 10 or 11 short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just distal to last of those teeth, at about five-sixths of fang length, followed proximally by about seven long, weak bristles; fang evenly curved, tip directed dorsally. Palp as in *M. eden*. Endites longer than wide (3:2); labrum with median ventral and large paired lateral dorsal protuberances; labium

wider than long (7:5); sternum longer than wide (8:5).

	I	II	III	IV	Palp
Femur	1.08	0.83	0.79	1.07	0.47
Patella	0.38	0.32	0.37	0.45	0.16
Tibia	0.85	0.61	0.61	0.81	0.40
Metatarsus	0.79	0.49	0.48	0.82	—
Tarsus	<u>0.47</u>	<u>0.43</u>	<u>0.31</u>	<u>0.43</u>	<u>0.45</u>
Total	3.57	2.68	2.56	3.58	1.48

Gonopore with posterior flap and sharply angled sclerotized anterior rim (fig. 191); arch of median receptaculum thickened and prolonged at midline.

MALE: As in female, except for the following. Carapace 1.56 long, 0.85 wide, 1.01 high. Abdomen 1.26 long, 0.90 wide. Abdominal sclerotized patches reduced to tiny strips. Eye diameter ratio, 8:7:7; PME separated from each other by three times, from ALE by twice, their diameter. Clypeal height at midpoint almost equal to PME interdistance. Chelicerae 0.94 long, 0.32 wide, promargin with 10 external and 13 or 14 internal peg teeth and patch of seven peg teeth opposite fang tip. Palpal femur with two stridulatory picks.

	I	II	III	IV	Palp
Femur	0.97	0.79	0.72	0.96	0.30
Patella	0.31	0.25	0.27	0.36	0.16
Tibia	0.83	0.58	0.50	0.79	0.22
Metatarsus	0.72	0.51	0.48	0.76	—
Tarsus	<u>0.48</u>	<u>0.31</u>	<u>0.31</u>	<u>0.32</u>	<u>0.47</u>
Total	3.31	2.44	2.28	3.19	1.21

Palp (figs. 152–154) with single denticle at apex of short, wide protuberance near distal end of retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe small, spur directed distally.

MATERIAL EXAMINED: Only the types.

DISTRIBUTION: Known only from Llanquihue, Chile.

Mecysmauchenius thayerae, new species

Figures 155–157

TYPE: Male holotype taken in a Berlese sample of leaf and log litter in a secondary Valdivian forest at an elevation of 160 m. in hills south of Muicolpué, Osorno, Chile (Dec. 21, 1982; A. Newton and M. Thayer), deposited in AMNH.

ETYMOLOGY: The specific name is a patronym in honor of Dr. Margaret K. Thayer, one of the collectors of the holotype and many other fascinating spiders.

DIAGNOSIS: Males can be distinguished from those of *M. eden* by the distally directed cymbial spur (figs. 156, 157), from those of *M. canan* by the presence of a median protuberance on the subcheliceral area of the carapace (as in fig. 85), and from those of *M. newtoni* by having the subcheliceral protuberance sharply pointed rather than blunt.

FEMALE: Unknown.

MALE: Carapace 1.76 long, 0.90 wide, 0.99 high. Abdomen 1.44 long, 1.10 wide. Coloration as in *M. eden* except that ventral abdominal sclerotized patches are reduced to tiny strips. Eye diameter ratio, PME:ALE:PLE, 9:10:11; PME separated by three times their diameter, by same distance from ALE. Clypeal height at midpoint only three-fourths of PME interdistance. Subcheliceral area of carapace with pointed protuberance closer to chelicerae than to mouthparts. Chelicerae 1.15 long, 0.38 wide, stout, posterolateral surface with oblique patch of about seven stridulatory ridge series situated just proximal of level of fang tip; promargin with external row of 11 short peg teeth, internal row of 13 peg teeth, of which five or six most proximal are much smaller than others, and patch of six or seven short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound adjacent to last of those teeth, at about two thirds of fang length, followed proximally by about eight long, weak bristles; fang evenly curved, tip directed obliquely. Palp with two or three stridulatory picks proximally on prolateral surface of femur, with stiff bristles but without spines on tibia and tarsus. Endites longer than wide (3:2); labrum with median ventral and large paired lateral dorsal protuberances; labium wider than long (7:5); sternum longer than wide (4:3).

	I	II	III	IV	Palp
Femur	1.13	0.81	0.80	0.99	0.37
Patella	0.31	0.28	0.27	0.38	0.21
Tibia	0.86	0.66	0.52	0.79	0.24
Metatarsus	0.81	0.56	0.53	0.77	—
Tarsus	0.46	0.37	0.31	0.44	0.45
Total	3.57	2.68	2.43	3.37	1.27

Palp (figs. 155–157) with single denticle at apex of short, wide protuberance near distal end of retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe almost obliterated, spur directed distally.

MATERIAL EXAMINED: Only the holotype.

DISTRIBUTION: Known only from Osorno, Chile.

Mecysmauchenius chacamo, new species

Figure 192

TYPE: Female holotype from Chacamo, Cautín, Chile (February 16–24, 1981; L. E. Peña), deposited in AMNH.

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

DIAGNOSIS: Females can be distinguished from those of *M. canan* by the presence of a median protuberance on the subcheliceral area of the carapace (as in fig. 85), from those of *M. newtoni* by the more widely separated ventral abdominal sclerotized patches (fig. 192), and from those of *M. eden* by the larger size of the ventral abdominal sclerotized patches (fig. 192).

FEMALE: Carapace 1.91 long, 1.06 wide, 1.17 high. Abdomen 1.84 long, 1.24 wide. Carapace reddish brown, lightest anteriorly; chelicerae dark reddish brown; sternum and mouthparts orangish brown; abdomen pale yellow, without pigment markings but venter with pair of large, well separated brown sclerotized patches behind epigastric groove; legs and palpi light brown. Eye diameter ratio, PME:ALE:PLE, 9:10:9; PME separated by more than three times their diameter, by 2.5 times their diameter from ALE. Clypeal height at midpoint only two-thirds of PME interdistance. Subcheliceral area of carapace with large, blunt protuberance at about half its height. Chelicerae 1.15 long, 0.45 wide, stout, posterolateral surface with oblique patch of about six stridulatory ridge series situated at level of fang tip; promargin with external row of nine short peg teeth, internal row of 12 peg teeth, of which four most proximal are much smaller than others, and patch of 11 short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just distal to last of those teeth, followed posteriorly by row of about five long, strong bristles; fang evenly curved, tip di-

rected obliquely. Palp with single stridulatory pick proximally on prolateral surface of femur, weak prolateral spine at distal tip of tibia, and about six spines on tarsus. Endites longer than wide (4:3); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (3:2); sternum longer than wide (4:3).

	I	II	III	IV	Palp
Femur	1.00	0.87	0.88	1.19	0.48
Patella	0.37	0.40	0.39	0.44	0.20
Tibia	0.90	0.65	0.60	0.93	0.45
Metatarsus	0.82	0.58	0.58	0.85	—
Tarsus	<u>0.48</u>	<u>0.39</u>	<u>0.32</u>	<u>0.42</u>	<u>0.47</u>
Total	3.57	2.89	2.77	3.83	1.60

Gonopore with soft posterior flap and rounded, sclerotized anterior rim (fig. 192); small receptacula extending to arch of median receptaculum.

MALE: Unknown.

MATERIAL EXAMINED: Only the holotype.

DISTRIBUTION: Known only from Cautín, Chile.

Mecysmauchenius canan, new species

Figures 158–160, 193

TYPES: Male holotype from Canan, Isla de Chiloé, Chiloé, Chile (February 26, 1972; T. Cekalovic) and female paratype sifted from wet forest litter at an elevation of 17 m. at Chepu, Isla de Chiloé, Chiloé, Chile (November 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: Specimens of both sexes can be easily distinguished from the other unpatterned species by the absence of a median protuberance on the subcheliceral area of the carapace (as in fig. 86).

FEMALE: Carapace 1.18 long, 0.63 wide, 0.64 high. Abdomen 1.19 long, 0.85 wide. Carapace chestnut brown, lightest anteriorly; chelicerae reddish brown; sternum and mouthparts light brown; abdomen pale yellow, without pigment markings or sclerotized patches; legs and palpi light brown. Eye diameter ratio, PME:ALE:PLE, 7:6:7; PME separated from each other and from ALE by 2.5 times their diameter. Clypeal height at

midpoint equal to PME interdistance; teratological seventh eye present in front of right PME. Subcheliceral area of carapace short, tuberculate, otherwise unmodified. Chelicerae 0.72 long, 0.22 wide, stout, posterolateral surface with oblique patch of about five stridulatory ridge series situated proximal of level of fang tip; promargin with external row of six short peg teeth, internal row of 10 or 11 long peg teeth, and patch of eight or nine short peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound just proximal to last of those teeth, at about three-fourths of fang length, followed proximally by about five long, weak bristles; fang thin, evenly curved, tip directed dorsally. Palp with single stridulatory pick proximally on prolateral surface of femur, weak prolateral spine at distal tip of tibia, and about eight spines on tarsus. Endites longer than wide (3:2); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (9:5); sternum longer than wide (4:3).

	I	II	III	IV	Palp
Femur	0.78	0.49	0.54	0.68	0.26
Patella	0.22	0.20	0.20	0.24	0.14
Tibia	0.59	0.43	0.34	0.54	0.24
Metatarsus	0.46	0.29	0.35	0.54	—
Tarsus	<u>0.37</u>	<u>0.24</u>	<u>0.25</u>	<u>0.25</u>	<u>0.27</u>
Total	2.42	1.65	1.68	2.25	0.91

Gonopore with posterior flap and thin, sclerotized anterior rim (fig. 193); small receptacula extending far anterior of arch of median receptaculum.

MALE: As in female, except for the following. Carapace 1.02 long, 0.57 wide, 0.54 high. Abdomen 1.51 long, 0.86 wide. PME separated from each other and from ALE by three times their diameter. Clypeal height slightly less than PME interdistance; seventh eye absent. Chelicerae 0.60 long, 0.22 wide, promargin with external row of seven short peg teeth.

	I	II	III	IV	Palp
Femur	0.61	0.52	0.50	0.61	0.23
Patella	0.18	0.18	0.14	0.21	0.13
Tibia	0.50	0.39	0.36	0.49	0.18
Metatarsus	0.35	0.28	0.33	0.48	—
Tarsus	<u>0.25</u>	<u>0.22</u>	<u>0.22</u>	<u>0.23</u>	<u>0.37</u>
Total	1.89	1.59	1.55	2.02	0.91

Palp (figs. 158–160) with single denticle at apex of short protuberance on retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe slightly developed.

MATERIAL EXAMINED: One male taken with the holotype (AMNH).

DISTRIBUTION: Known only from Chiloé Island, Chile.

THE MACULATED SPECIES

In these six species the dorsum of the abdomen is almost completely covered by purple pigment; a few paramedian unpigmented areas may persist, in a chevron-like pattern, but the pigment is continuously distributed both along the midline and at the sides. The six species seem to form a distinctive and monophyletic group, for they are also united by having the pars cephalica more highly elevated than in their congeners (as in fig. 84).

Mecysmauchenius chepu, new species

Figures 161–163, 194

TYPES: Male holotype and female paratype sifted from wet forest litter at an elevation of 17 m. at Chepu, Isla de Chiloé, Chiloé, Chile (November 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: Males can be distinguished from those of *M. osorno* and *M. villarrica* by having only one denticle on the palpal tibia (fig. 163). Females can be distinguished from those of *M. gertschi* by having only six stridulatory picks on the palpal femur, from those of *M. victoria* and *M. osorno* by the absence of anterolateral protuberances on the median receptaculum, and from those of *M. chapo* by having the small receptacula originating from a heavily sclerotized bursa.

FEMALE: Carapace 2.61 long, 1.40 wide, 1.53 high. Abdomen 2.61 long, 1.97 wide. Carapace light brown, lightest anteriorly; chelicerae dark orange-brown; sternum and mouthparts light brown; abdomen pale yellow but dorsum almost completely covered with purple pigment, base color showing only as two paramedian rows of light spots, venter with paired paramedian and lateral purple longitudinal stripes, without sclerotized patches; legs and palpi light brown. Eye di-

ameter ratio, PME:ALE:PLE, 9:10:10; PME separated from each other and from ALE by slightly more than three times their diameter. Clypeal height at midpoint more than two-thirds of PME interdistance. Subcheliceral area of carapace without protuberance but with median longitudinal row of about 10 transverse ridges. Chelicerae 1.69 long, 0.49 wide, moderately stout, posterolateral surface with long oblique patch of about eight stridulatory ridge series diminishing in size proximally, situated at level of fang tip; promargin with external row of six or seven widely spaced short peg teeth, internal row of 15 or 17 long peg teeth, and patch of three long peg teeth opposite fang tip; cheliceral gland mound distal of those teeth, at about three-fourths of fang length, followed proximally by about seven strong, sinuous bristles; fang tip sinuous, directed obliquely. Palp with row of about six stridulatory picks along ventral edge of prolateral surface of femur, single distal prolateral spine on tibia, and five spines on tarsus. Endites longer than wide (3:2); labrum with median dorsal and long, paired lateral protuberances, the latter reaching almost to palpal trochanter; labium wider than long (17:14); sternum longer than wide (4:3).

	I	II	III	IV	Palp
Femur	1.56	1.31	1.22	1.61	0.57
Patella	0.49	0.48	0.47	0.54	0.22
Tibia	1.45	1.09	0.99	1.44	0.49
Metatarsus	1.21	0.95	0.88	1.40	—
Tarsus	<u>0.36</u>	<u>0.36</u>	<u>0.37</u>	<u>0.43</u>	<u>0.61</u>
Total	5.07	4.19	3.93	5.42	1.89

Gonopore with soft posterior flap and sclerotized, rebordered anterior rim posterior of thimble-shaped sclerotization (fig. 194); small receptacula originating from heavily sclerotized bursa, extending to arch of unmodified median receptaculum.

MALE: As in female, except for the following. Carapace 2.26 long, 1.22 wide, 1.17 high. Chelicerae 1.52 long, 0.38 wide, slender, with four long peg teeth opposite fang tip.

	I	II	III	IV	Palp
Femur	1.56	1.27	1.15	1.48	0.58
Patella	0.51	0.43	0.44	0.47	0.16
Tibia	1.36	1.05	0.85	1.31	0.21
Metatarsus	1.20	0.85	0.94	1.27	—
Tarsus	<u>0.42</u>	<u>0.44</u>	<u>0.38</u>	<u>0.51</u>	<u>0.77</u>
Total	5.05	4.04	3.76	5.04	1.72

Palp (figs. 161–163) with single denticle arising directly from retrolateral surface of tibia; retrolateral cymbial spur not on lobe.

MATERIAL EXAMINED: Only the types.

DISTRIBUTION: Known only from Chiloé Island, Chile.

***Mecysmauchenius chapo*, new species**

Figure 195

TYPE: Female holotype taken in a baited pitfall trap in a disturbed Valdivian rainforest at an elevation of 320 m. at Lago Chapo, 11.7 km. east of Correntoso, Llanquihue, Chile (December 16–27, 1982; A. Newton and M. Thayer), deposited in AMNH.

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

DIAGNOSIS: Females can be distinguished from those of *M. gertschi* by having only six stridulatory picks on the palpal femur, from those of *M. victoria* and *M. osorno* by the absence of anterolateral protuberances on the median receptaculum, and from those of *M. chepu* by having the small receptacula originating from an only slightly sclerotized bursa.

FEMALE: Carapace 2.27 long, 1.30 wide, 1.28 high. Abdomen 1.96 long, 1.33 wide. Coloration as in *M. chepu*. Eye diameter ratio, PME:ALE:PLE, 9:8:10; PME separated from each other and from ALE by three times their diameter. Clypeal height at midpoint equal to PME interdistance. Subcheliceral area of carapace without protuberance but with median longitudinal row of about eight transverse ridges. Chelicerae 1.55 long, 0.49 wide, slender, posterolateral surface with long oblique patch of about seven stridulatory ridge series diminishing in size proximally, situated just proximal of level of fang tip; pro-marginal with external row of seven widely spaced short peg teeth, internal row of 16 or 17 long peg teeth, and patch of three long peg teeth opposite fang tip; cheliceral gland mound prominent, distal of those teeth, at about five-sixths of fang length, followed proximally by about seven strong, sinuous bristles; fang tip sinuous, directed obliquely. Palp with row of six stridulatory picks proximally on prolateral surface of femur, single distal prolateral spine on tibia, and five spines on tarsus. Endites longer than wide (14:9);

labrum with median dorsal and long, paired lateral ventral protuberances; labium wider than long (9:7); sternum longer than wide (13:11).

	I	II	III	IV	Palp
Femur	1.55	1.26	1.20	1.53	0.50
Patella	0.60	0.47	0.43	0.52	0.23
Tibia	1.34	1.00	0.86	1.33	0.48
Metatarsus	1.17	0.81	0.83	1.46	—
Tarsus	<u>0.37</u>	<u>0.37</u>	<u>0.36</u>	<u>0.49</u>	<u>0.60</u>
Total	5.03	3.91	3.68	5.33	1.81

Gonopore with soft posterior flap and sclerotized, anterior rim posterior of thimble-shaped sclerotization (fig. 195); small receptacula originating from scarcely sclerotized bursa, extending to arch of unmodified median receptaculum.

MALE: Unknown.

MATERIAL EXAMINED: Only the holotype.

DISTRIBUTION: Known only from Llanquihue, Chile.

***Mecysmauchenius osorno*, new species**

Figures 84, 108, 109, 164–166, 196

TYPES: Male holotype from logs and stones at an elevation of 260 m. at Termas de Puyehue, Osorno, Chile (March 12, 1965; H. W. Levi), deposited in MCZ, and female paratype from Berlese sample of concentrated forest litter and moss taken at an elevation of 180 m. at the type locality (November 24, 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: Males can be distinguished from those of *M. chepu* by having three denticles on the palpal tibia (figs. 165, 166) and from those of *M. villarrica* by the deeply invaginated prolateral process situated distally on the palpal bulb (fig. 165). Females can be distinguished from those of *M. gertschi* by having only six stridulatory picks on the palpal femur and from those of *M. victoria*, *M. chapo*, and *M. chepu* by having a pair of very short protuberances anterolaterally on the arch of the median receptaculum.

FEMALE: Carapace 2.29 long, 1.28 wide, 1.30 high. Abdomen 2.02 long, 1.62 wide. Carapace brown, lightest anteriorly; chelicerae orangish brown; sternum and mouth-

parts light brown; abdomen pale yellow but dorsum and sides of venter almost completely covered with purple pigment, venter also with pair of paramedian longitudinal purple stripes but without sclerotized patches; legs and palpi light brown. Eye diameter ratio, PME:ALE:PLE, 8:9:9; PME separated from each other and from ALE by three times their diameter. Clypeal height at midpoint five-sixths of PME interdistance. Subcheliceral area of carapace without protuberance but with median longitudinal row of about eight transverse ridges. Chelicerae 1.55 long, 0.47 wide, slender, posterolateral surface with oblique patch of about seven stridulatory ridge series situated at level of fang tip; promargin with external row of nine short peg teeth, internal row of 14 long peg teeth, and patch of three long peg teeth on retromargin opposite fang tip; cheliceral gland mound prominent, far distal to retromarginal peg teeth, at about five-sixths of fang length, followed proximally by about eight long, strong bristles; fang evenly curved, tip directed obliquely. Palp with row of about six stridulatory picks along ventral edge of prolateral surface of femur, weak distal prolateral spine on tibia, and about five spines on tarsus. Endites longer than wide (5:3); labrum with median dorsal and long, paired lateral ventral protuberances, the latter reaching almost to palpal trochanter; labium wider than long (7:5); sternum longer than wide (5:4).

	I	II	III	IV	Palp
Femur	1.48	1.20	1.12	1.50	0.48
Patella	0.51	0.45	0.46	0.44	0.18
Tibia	1.22	0.91	0.88	1.20	0.45
Metatarsus	1.11	0.81	0.85	1.30	—
Tarsus	<u>0.36</u>	<u>0.38</u>	<u>0.33</u>	<u>0.49</u>	<u>0.52</u>
Total	4.68	3.75	3.64	4.93	1.63

Gonopore with rounded posterior flap and tent-shaped sclerotized anterior rim (fig. 196); small receptacula originating from unsclerotized bursa, extending to arch of median receptaculum, which bears tiny projections at its anterolateral corners.

MALE: As in female, except for the following. Carapace 1.95 long, 1.30 wide, 1.30 high. Abdomen missing. PME separated from each other and from ALE by 2.5 times their diameter. Chelicerae 1.37 long, 0.38 wide,

stridulatory ridges reduced, proximal to level of fang tip; promargin with external row of eight or nine short peg teeth and internal row of 13 or 14 long peg teeth.

	I	II	III	IV	Palp
Femur	1.75	1.30	1.17	1.43	0.71
Patella	0.58	0.43	0.47	0.52	0.21
Tibia	1.51	1.11	0.96	1.36	0.26
Metatarsus	1.45	0.84	0.99	1.36	—
Tarsus	<u>0.45</u>	<u>0.47</u>	<u>0.39</u>	<u>0.49</u>	<u>0.78</u>
Total	5.74	4.15	3.98	5.16	1.96

Palp (figs. 164–166) with three denticles arising directly from retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe obliterated.

MATERIAL EXAMINED: Only the types.

DISTRIBUTION: Known only from Osorno, Chile.

***Mecysmauchenius villarrica*, new species**
Figures 167–169

TYPE: Male holotype taken in a window trap at an elevation of 1250 m. in a *Nothofagus pumilio-Chusquea* forest on Volcán Villarrica, Cautín, Chile (December 15–29, 1982; A. Newton and M. Thayer), deposited in AMNH.

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

DIAGNOSIS: Males can distinguished from those of *M. chepu* by having three denticles on the palpal tibia (figs. 168, 169) and from those of *M. osorno* by the absence of a deep invagination on the prolateral terminal process of the palp (fig. 168).

FEMALE: Unknown.

MALE: Carapace 2.07 long, 1.20 wide, 0.99 high. Abdomen 1.81 long, 1.30 wide. Carapace brown with light median stripe on pars cephalica; coloration otherwise as in *M. osorno*. Eye diameter ratio, PME:ALE:PLE, 3:4:3; PME separated from each other and from ALE by three times their diameter. Clypeal height at midpoint two-thirds of PME interdistance. Subcheliceral area of carapace without protuberance but with median longitudinal row of about 10 transverse ridges. Chelicerae 1.37 long, 0.39 wide, slender, prolateral surface with oblique patch of about seven stridulatory ridge series situated at level

of fang tip; promargin with external row of six short peg teeth, internal row of 16 or 17 long peg teeth, and patch of three or four long peg teeth on retromargin opposite fang tip; cheliceral gland mound prominent, far distal to retromarginal peg teeth, followed by about eight long, strong bristles; fang abruptly curved distally, tip directed dorsally. Palp with row of about six stridulatory picks proximally on prolateral surface of femur, with bristles but no spines on tibia and tarsus. Endites longer than wide (3:2); labrum with median dorsal and long, paired lateral ventral protuberances; labium wider than long (5:3); sternum longer than wide (5:4).

	I	II	III	IV	Palp
Femur	1.48	1.19	1.08	1.37	0.58
Patella	0.48	0.40	0.43	0.47	0.18
Tibia	1.22	0.94	0.77	1.15	0.22
Metatarsus	1.08	0.80	0.79	1.15	—
Tarsus	<u>0.41</u>	<u>0.43</u>	<u>0.36</u>	<u>0.47</u>	<u>0.57</u>
Total	4.67	3.76	3.43	4.61	1.55

Palp (figs. 167–169) with three denticles arising directly from retrolateral surface of tibia; retrolateral cymbial spur-bearing lobe obliterated.

OTHER MATERIAL EXAMINED: One male taken in a baited pitfall trap with the holotype (AMNH).

DISTRIBUTION: Known only from Cautín, Chile.

***Mecysmauchenius victoria*, new species**

Figure 197

TYPE: Female holotype from a carrion trap at an elevation of 200 m. 15 km. west of Victoria, Malleco, Chile (December 28–31, 1976; S. Peck), deposited in FMNH.

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

DIAGNOSIS: Females can be distinguished from those of all other species by the presence of a pair of ovoid lobes anterolaterally on the arch of the median receptaculum (visible, to a limited extent, even through the ventral cuticle; fig. 197).

FEMALE: Carapace 3.10 long, 1.80 wide, 2.27 high. Abdomen 2.93 long, 2.02 wide. Carapace reddish brown, lightest anteriorly and along middle of caput; chelicerae dark reddish brown; sternum and mouthparts

brown; abdomen yellow but dorsum and sides almost completely covered with purple pigment, uncovered areas in vague chevron pattern, venter with median purple blotch but without sclerotized patches; legs and palpi light reddish brown. Eye diameter ratio, PME: ALE:PLE, 10:11:10; PME separated from each other and from ALE by four times their diameter. Clypeal height at midpoint three-fourths of PME interdistance. Subcheliceral area of carapace without protuberance but with median longitudinal row of about 14 transverse ridges. Chelicerae 2.50 long, 0.55 wide, slender, posterolateral surface with oblique patch of about nine stridulatory ridge series (three most distal highest) situated proximal to level of fang tip; promargin with external row of 13 short peg teeth, internal row of 18 or 19 long peg teeth, and patch of three long peg teeth opposite fang tip; cheliceral gland mound far distal to last of those teeth, at about three-fourths of fang length, followed proximally by about eight long, strong bristles; fang abruptly curved distally, tip directed obliquely. Palpi missing. Endites longer than wide (3:2); labrum with median dorsal and long, paired lateral ventral protuberances; labium wider than long (3:2); sternum longer than wide (13:10).

	I	II	III	IV	Palp
Femur	2.06	1.60	1.51	2.05	—
Patella	0.67	0.58	0.60	0.71	—
Tibia	1.88	1.37	1.19	1.70	—
Metatarsus	1.58	1.17	1.21	1.80	—
Tarsus	<u>0.38</u>	<u>0.37</u>	<u>0.29</u>	<u>0.45</u>	—
Total	6.57	5.09	4.80	6.71	—

Gonopore with posterior flap and arched, sclerotized anterior rim (fig. 197); small receptacula originating from unsclerotized bursa, not extending to arch of median receptaculum, which bears pair of large ovoid anterolateral enlargements.

MALE: Unknown.

MATERIAL EXAMINED: Only the holotype.

DISTRIBUTION: Known only from Malleco, Chile.

***Mecysmauchenius gertschi* Zapfe**

Figure 198

Mecysmauchenius gertschi Zapfe, 1960, p. 9, figs. 1–10 (female holotype from Maipú, Santiago, Chile, depository unknown).

NOTE: In view of the highly relictual distribution of the known Chilean mecysmaucheniiids, it is quite possible that the specimen described below, from Coquimbo province, is in fact not *M. gertschi*. However, in view of its close correspondence to Zapfe's description, particularly with regard to the high number of stridulatory picks, it seems best to assign the specimen to *M. gertschi* until topotypical material becomes available.

DIAGNOSIS: Females can be easily distinguished from those of all other species by the presence of 12 stridulatory picks on the palpal femur.

FEMALE: Carapace 3.10 long, 1.60 wide, 1.81 high. Abdomen 2.23 long, 1.68 wide. Carapace orange, lightest anteriorly; chelicerae dark orange; sternum and mouthparts light orange; abdomen pale yellow, dorsum with median and lateral purple longitudinal stripes connected by four chevrons, venter with paired paramedian and lateral purple longitudinal stripes, without sclerotized patches; legs orange, lightest distally; palp yellow. Eye diameter ratio, PME:ALE:PLE, 4:5:5; PME separated by 3.5, from ALE by 3.2, times their diameter. Clypeal height at midpoint slightly less than PME interdistance. Subcheliceral area of carapace without protuberance but with median longitudinal row of about 14 transverse ridges. Chelicerae 2.34 long, 0.49 wide, slender, posterolateral surface with oblique patch of about 10 stridulatory ridge series of which most distal are most prominent and situated at level of fang tip; promargin with external row of 10 short peg teeth, internal row of 19 or 20 long peg teeth, and patch of four long peg teeth opposite tip of fang; retromargin with cheliceral gland mound at about three-quarters of fang length, followed by proximal row of about 10 very long, curved bristles; fang sinuous, tip directed laterally. Palp with row of about 12 stridulatory picks along ventral edge of prolateral surface of femur, weak prolateral spine at distal end of tibia, and five strong spines on tarsus. Endites longer than wide (7:5); labrum with median dorsal and long, paired lateral ventral protuberances; labium wider than long (3:2); sternum longer than wide (4:3).

	I	II	III	IV	Palp
Femur	2.43	1.94	1.76	2.38	0.68
Patella	0.71	0.58	0.54	0.58	0.26
Tibia	2.27	1.66	1.45	1.97	0.64
Metatarsus	1.99	1.37	1.41	2.14	—
Tarsus	<u>0.49</u>	<u>0.51</u>	<u>0.47</u>	<u>0.54</u>	<u>0.71</u>
Total	7.89	6.06	5.63	7.61	2.29

Gonopore with posterior flap and posteriorly widened sclerotized anterior rim (fig. 198); small receptacula originating from unsclerotized bursa, not extending to arch of unmodified median receptaculum.

MALE: Unknown.

MATERIAL EXAMINED: CHILE: *Coquimbo*: Pichidangui, Aug. 12, 1966 (E. I. Schlinger, UCB), 1f.

DISTRIBUTION: Known only from Santiago and Coquimbo, Chile.

MECYSMAUCHENIOIDES, NEW GENUS

TYPE SPECIES: *Mecysmauchenius norden-skjoldi* Tullgren.

ETYMOLOGY: The generic name refers to the similarity of the genus to *Mecysmauchenius*; the gender is masculine.

DIAGNOSIS: *Mecysmauchenioides* can be distinguished easily from the other known genera by genitalic characters: the male palp lacks a denticle on the tibia and bears a large, denticulate lobe extending from below the embolus (figs. 201–203) and the female epigastric region bears a prominent, slender, scape-shaped lobe extending from the base of the petiole back to the epigastric furrow (fig. 182).

DESCRIPTION: Medium-sized (4–5 mm.) mecysmauchenines with six eyes (AME missing). Abdomen unpigmented. Tarsal organ with prominent sensory spine surrounded by up to five short sensory lobes arising from wide but shallow cup (figs. 110, 111). Female internal genitalia as in *Mecysmauchenius*, with numerous stalked receptacula grouped into two bunches (fig. 183); external surface of genitalic region only weakly sclerotized but with prominent slender lobe extending back from base of petiole to epigastric furrow (fig. 182). Male palp with spur on retromargin of cymbium, without denticles on retrolateral surface of tibia (fig. 203).

INCLUDED SPECIES: Only the type species.
DISTRIBUTION: Southern Chile.

Mecysmauchenioides nordenskjoldi
(Tullgren), new combination

Figures 87, 95, 110, 111, 182, 183, 201–203

Mecysmauchenius nordenskjoldi Tullgren, 1901, p. 222, pl. 3, figs. 6a–c (male and female syntypes from four localities in Magallanes, Chile, should be in Naturhistoriska Riksmuseet, Stockholm, not examined). Canals, 1934, p. 7, figs. 5c, 5d.

DIAGNOSIS: With the characters of the genus.

FEMALE: Described by Tullgren (1901).

MALE: Described by Tullgren (1901).

MATERIAL EXAMINED: CHILE: *Chiloé*: Chaitén, elevation 0–100 m., Berlese, concentrated forest moss, Dec. 7, 1981 (N. I. Platnick, R. T. Schuh, AMNH), 1m; Chepu, Isla de Chiloé, elevation 17 m., wet forest litter, Nov. 29, 1981 (N. I. Platnick, R. T. Schuh, AMNH), 1f. *Magallanes*: Río San Juan, Jan. 25, 1976 (T. Cekalovic, AMNH), 1m. *Malleco*: Parque Nacional Nahuelbuta, Nov. 19, 1981 (T. Cekalovic, AMNH), 1f.

DISTRIBUTION: Southern Chile.

SEMYSMAUCHENIUS, NEW GENUS

TYPE SPECIES: *Semysmauchenius antillanca*, new species.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is masculine.

DIAGNOSIS: *Semysmauchenius* can be distinguished easily from the other known genera by the shape of the carapace (fig. 173) and by having both the abdominal dorsum and venter entirely covered (except for a small area behind the gonopore) with purple pigment (figs. 173, 199). Males can also be separated from those of the co-occurring genera *Mecysmauchenius* and *Mecysmauchenioides* by the absence of a retrolateral cymbial spur, from those of *Mesarchaea* by the presence of only one denticle on the palpal tibia, and from those of *Aotearoa* by the absence of anterior median eyes. Females can also be separated from those of *Mecysmauchenius*, *Mecysmauchenioides*, and *Aotearoa* by the shorter,

wider pedipalp and the low, scarcely arched median receptaculum.

DESCRIPTION: Small (2.5–4.0 mm.) mecy-smauchenines with six eyes (AME missing). Abdomen covered (except for small area immediately behind gonopore) with purple pigment in distinct spots. Tarsal organ with prominent sensory spine surrounded by three short sensory lobes arising from shallow cup (at least on anterior legs; fig. 178). Female internal genitalia with median receptaculum scarcely developed, represented by internal portions of broad, low, sclerotized anterior rim of gonopore (fig. 199); stalked receptacula divided into more posterior series of about six smaller and more anterior series of about six larger spheres; external surface unmodified. Male palp without spur on retromargin of cymbium, with single small denticle on retrolateral surface of tibia (fig. 172).

INCLUDED SPECIES: Only the type species.

DISTRIBUTION: Chile.

Semysmauchenius antillanca, new species

Figures 170–173, 178, 199

TYPE: Male holotype taken in a window trap in a *Nothofagus dombeyi*-*Saxegothea Drimys* forest at an elevation of 1120 m. on Volcán Villarrica, Cautín, Chile (December 15–29, 1982; A. Newton and M. Thayer) and female paratype taken in a Berlese sample of leaf and log litter in a mixed *Nothofagus* forest at an elevation of 720 m. on the Antillanca road, Parque Nacional Puyehue, Osorno, Chile (December 18–24, 1982; A. Newton and M. Thayer), deposited in AMNH.

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

DIAGNOSIS: With the characters of the genus. Although the males and females described below are from different localities, it is most parsimonious to consider them conspecific until additional specimens of the genus indicate otherwise.

FEMALE: Carapace 1.51 long, 0.97 wide, 0.97 high. Abdomen 1.82 long, 1.30 wide. Carapace dark chestnut brown, lightest anteriorly; chelicerae reddish brown; sternum and mouthparts orangish brown; abdomen

pale yellow but, except for small area behind epigastric groove, both dorsum and venter evenly covered with purple pigment, without sclerotized patches; legs and palpi light brown except for yellow patellae. Eye diameter ratio, PME:ALE:PLE, 10:12:11; PME separated from each other and from ALE by 2.5 times their diameter. Clypeal height at midpoint almost equal to PME interdistance. Subcheliceral area of carapace without protuberance, tuberculate, otherwise unmodified. Chelicerae 0.94 long, 0.34 wide, stout, posterolateral surface with oblique patch of about eight stridulatory ridge series, situated proximal of level of fang tip; promargin with external row of six short peg teeth, internal row of eight or nine long peg teeth, and patch of six or seven short peg teeth opposite tip of fang; retromargin with cheliceral gland mound just distal to last of those teeth, at about three-fourths of fang length, with no distinctively long proximal bristles; fang bent at tip, tip directed dorsally. Palp with single stridulatory pick set in lightly sclerotized circle proximally on prolateral surface of femur, without tibial spine, with six weak spines on tarsus. Endites longer than wide (4:3); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (5:3); sternum longer than wide (3:2).

	I	II	III	IV	Palp
Femur	0.96	0.77	0.76	0.99	0.38
Patella	0.34	0.29	0.27	0.36	0.17
Tibia	0.83	0.58	0.56	0.84	0.37
Metatarsus	0.72	0.50	0.55	0.84	—
Tarsus	<u>0.47</u>	<u>0.36</u>	<u>0.25</u>	<u>0.34</u>	<u>0.45</u>
Total	3.32	2.50	2.39	3.37	1.37

Gonopore with soft posterior flap and weakly sclerotized, angular anterior rim (fig. 199); small receptacula originating from unsclerotized bursa, extending anterior of scarcely developed arch of median receptaculum.

MALE: As in female except for the following. Carapace 1.11 long, 0.82 wide, 0.76 high. Abdomen 1.20 long, 0.92 wide, with pigment blotches more pronounced dorsally than ventrally. Eye diameter ratio, 10:10:11; PME separated by twice their diameter, by 1.5 times their diameter from ALE. Clypeal height at midpoint three-fourths of PME interdistance. Chelicerae 0.73 long, 0.20 wide; pro-

margin with external row of five or six short peg teeth, internal row of nine long peg teeth, and patch of five or six short peg teeth opposite tip of fang; retromargin with row of eight long, weak setae proximal of cheliceral gland mound. Palp with two stridulatory picks.

	I	II	III	IV	Palp
Femur	0.85	0.61	0.63	0.79	0.32
Patella	0.25	0.23	0.23	0.24	0.12
Tibia	0.76	0.50	0.50	0.70	0.20
Metatarsus	0.59	0.48	0.43	0.68	—
Tarsus	<u>0.47</u>	<u>0.32</u>	<u>0.24</u>	<u>0.27</u>	<u>0.43</u>
Total	2.92	2.14	2.03	2.68	1.07

Palp (figs. 170–172) with small proximal denticle arising directly from retrolateral surface of tibia; cymbium without spur.

OTHER MATERIAL EXAMINED: Two males taken with the holotype, one female taken in a window trap in a Valdivian rainforest at an elevation of 690 m. at the paratype locality, December 18–24, 1982, and one female taken in a Berlese sample of leaf and log litter in a Valdivian rainforest at an elevation of 430 m. 4.1 km. east of Anticura, Parque Nacional Puyehue, Osorno, Chile, Dec. 19–26, 1982, all collected by A. Newton and M. Thayer and in AMNH.

DISTRIBUTION: Known only from Cautín and Osorno, Chile.

MESARCHAEA, NEW GENUS

TYPE SPECIES: *Mesarchaea bellavista*, new species.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

DIAGNOSIS: *Mesarchaea* can be distinguished easily from the other known genera by the shape of the carapace (fig. 174), which approaches those of true archaeids in its degree of elevation, as well as by the presence of tubercles on the dorsal surface of the pars cephalica, the presence of stiff setae on the abdomen, and by the occurrence of numerous denticles on the male palpal tibia (fig. 177). The spiders also appear to be unique in having a proximal ring of unsclerotized cuticle on both the metatarsi and tarsi. Males can also be separated from those of the co-occurring genera *Mecysmauchenius* and *Me-*

cysmauchenioides by the absence of a retrolateral cymbial spur, from those of *Semysmaucheni* by the ventrally unpigmented abdomen, and from those of *Aotearoa* by the absence of anterior median eyes.

DESCRIPTION: Small (3.5 mm.) mecysmaucheniines with six eyes (AME missing) on elevated caput (fig. 174). Abdomen with purple pigment distributed in almost transverse bands on dorsum and sides; bands accompanied by stiffened setae; median area of venter unpigmented. Tarsal organ with long sensory spine and two short sensory lobes arising from rugose protuberance (fig. 179). Females unknown. Male palp without spur on retromargin of cymbium, with numerous small denticles on retrolateral surface of tibia (fig. 177).

INCLUDED SPECIES: Only the type species.

DISTRIBUTION: Chile.

Mesarchaea bellavista, new species

Figures 174–177

TYPE: Male holotype taken in a window trap at an elevation of 310 m. in a Valdivian rainforest at Bellavista on the north shore of Lago Villarrica, Cautín, Chile (December 15–30, 1982; A. Newton and M. Thayer), deposited in AMNH.

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

DIAGNOSIS: With the characters of the genus.

FEMALE: Unknown.

MALE: Carapace 1.85 long, 1.18 wide, 1.71 high. Abdomen 1.46 long, 1.26 wide. Carapace reddish brown, lightest medially on pars cephalica, with darkened tubercles on pars cephalica and subcheliceral area; chelicerae dark reddish brown; sternum and mouthparts orangish brown, sternum tuberculate; abdomen pale yellow, dorsum and sides with about seven wide, almost transverse bands of purple pigment accompanied by stiff setae, venter unpigmented medially, without sclerotized patches; legs and palpi light brown, femora tuberculate ventrally. Eye diameter ratio, PME:ALE:PLE, 11:11:10; PME separated from each other and from ALE by three times their diameter. Clypeal height at mid-point two-thirds of PME interdistance. Subcheliceral area of carapace without protuber-

ance, tuberculate except along midline, where smooth except for slight longitudinal ridge. Chelicerae 1.87 long, 0.33 wide, slender, posterolateral surface with long oblique patch of about nine stridulatory ridge series situated just proximal of level of fang tip, most distal ridge series distinctly elevated; promargin with external row of five short peg teeth, internal row of 17 or 18 long peg teeth, and patch of nine long peg teeth extending around tip of fang groove to retromargin; cheliceral gland mound large, produced medially, separated distally from last retromarginal peg tooth, followed proximally by about 10 long, weak bristles; fang almost semicircular, tip directed obliquely. Palp with oblique row of nine stridulatory picks proximally on prolateral surface of femur, with stiff bristles but no spines on tibia and tarsus. Endites longer than wide (5:3); labrum with single median and paired lateral protuberances at roughly same level dorsoventrally, lateral protuberances extremely long, sharply pointed, extending past sides of endites; labium wider than long (5:4); sternum longer than wide (19:17).

	I	II	III	IV	Palp
Femur	1.68	1.26	1.08	1.53	0.58
Patella	0.37	0.36	0.36	0.39	0.18
Tibia	1.54	1.15	0.86	1.22	0.35
Metatarsus	1.19	0.86	0.79	1.07	—
Tarsus	<u>0.36</u>	<u>0.43</u>	<u>0.29</u>	<u>0.40</u>	<u>0.40</u>
Total	5.14	4.06	3.38	4.61	1.51

Palp (figs. 175–177) with 14 denticles arising directly from retrolateral surface of tibia; cymbium without spur.

MATERIAL EXAMINED: Only the holotype.

DISTRIBUTION: Known only from Cautín, Chile.

AOTEAROA, NEW GENUS

Figures 76–78, 80, 81, 88, 112, 122, 184, 207–209

TYPE SPECIES: *Zearchaea magna* Forster (1949).

ETYMOLOGY: The generic name is taken from the Maori name for New Zealand; the gender is feminine.

DIAGNOSIS: *Aotearoa* can be distinguished easily from the other known mecysmau-

cheniine genera by the presence of eight eyes and of a pigment pattern on the carapace (figs. 76–78).

DESCRIPTION: Relatively small (3 mm.) mecysmaucheniines with eight eyes. Abdomen with prominent chevron pattern of reddish brown pigment on dorsum, pattern also present on carapace (figs. 76–78). Tarsal organ with single, erect, distally directed sensory spine and smaller secondary sensory lobe (fig. 112). Female internal genitalia with large median receptaculum associated with extensive secretory gland and four reniform receptacula; long slender duct leading from each small receptaculum to single median opening near base of median receptaculum (fig. 184). Male palp without spur on retromargin of cymbium, with one denticle on tibia (figs. 207–209).

INCLUDED SPECIES: Only the type species.

DISTRIBUTION: Known only from beech forests in the Fiordland region in the southwestern part of the South Island of New Zealand.

ZEARCHAEINAE, NEW SUBFAMILY

TYPE GENUS: *Zearchaea* Wilton.

DIAGNOSIS: Zearchaeines can be distinguished from mecysmaucheniines by the presence of only two or three peg teeth, in a single row, on the cheliceral promargin (figs. 123, 124, 133, 134).

DESCRIPTION: Clypeus thickened, arched, and bulging (figs. 82, 83). Chelicerae long, slender, not swollen (fig. 89), with two or three promarginal peg teeth in single row; few additional peg teeth opposite fang tip (figs. 121, 123, 124, 133, 134); stridulatory ridges on outer surface evenly spaced (fig. 131). Female palp shorter and wider than in mecysmaucheniines; femur with one or more setal bases elaborated into stridulatory picks (fig. 132).

INCLUDED GENERA: *Zearchaea*, *Chilarchaea*.

DISTRIBUTION: New Zealand and Chile.

ZEARCHAEA WILTON

Figures 79, 82, 83, 89, 92, 94, 99–103, 113, 114, 121, 123, 124, 129, 130, 185, 204, 205, 220

Zearchaea Wilton, 1946, p. 19 (type species by monotypy *Zearchaea clypeata* Wilton).

DIAGNOSIS: Specimens can be distinguished from those of *Chilarchaea* by the presence of eight eyes and of a triangular sclerite, located below and between the bases of the right and left chelicerae, within the foramen of the carapace from which the chelicerae originate.

DESCRIPTION: Small (2.0–2.5 mm.) zearchaeines with eight eyes. Abdomen without chevrons but sometimes heavily pigmented; carapace not patterned. Tarsal organ with distally directed sensory spine and one or two smaller sensory lobes arising from oval, shallow, rugose cup (figs. 113, 114). Female internal genitalia consisting of distinct median receptaculum associated with extensive gland and six to eight small, spherical receptacula from which long, slender ducts extend back to single opening at base of median receptaculum (fig. 185). Male palp without cymbial spur, with at least one denticle on retrolateral surface of tibia; bulb relatively large, much simpler than in mecysmaucheniines; embolus may be spiniform but not elongated, usually accompanied by only one other process (figs. 204, 205).

INCLUDED SPECIES: *Zearchaea clypeata* Wilton (1946) and *Z. fiordensis* Forster (1955). Three other species originally described in *Zearchaea* have been transferred to other genera: *Z. magna* Forster (1949) to *Aotearoa* (NEW COMBINATION), *Z. rubra* Forster (1949) to *Pararchaea* (by Forster, 1955), and *Z. globosa* Hickman (1981) to *Holarchaea* (NEW COMBINATION).

DISTRIBUTION: New Zealand.

CHILARCHAEA, NEW GENUS

TYPE SPECIES: *Chilarchaea quellon*, new species.

ETYMOLOGY: The generic name refers to the Chilean distribution and is feminine in gender.

DIAGNOSIS: Specimens can be distinguished from those of *Zearchaea* by the presence of only six eyes and the absence of a triangular sclerite below the chelicerae and within the cheliceral foramen of the carapace.

DESCRIPTION: Small (under 2 mm.) zearchaeines with six eyes (AME missing). Abdomen with distinctive color pattern on dorsum (fig. 200); carapace not patterned. Tarsal

organ with distally directed sensory spine and two smaller sensory lobes arising from oval, shallow, rugose cup (fig. 115). Female internal genitalia consisting of arched median receptaculum and six small, spherical receptacula from which long, posteriorly coiled ducts extend back to separate openings at base of median receptaculum (figs. 210, 211). Males unknown.

INCLUDED SPECIES: Only the type species.

DISTRIBUTION: Chile.

Chilarchaea quellon, new species

Figures 115, 131–136, 200, 210, 211

TYPE: Female holotype from a Berlese sample of concentrated forest floor litter and moss taken at an elevation of 105 m. 5 km. north of Quellón, Isla de Chiloé, Chiloé, Chile (December 1, 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: With the characters of the genus.

FEMALE: Carapace 0.90 long, 0.52 wide, 0.43 high. Abdomen 0.83 long, 0.54 wide. Carapace (except for reddish brown clypeus) light orange, lightest medially; chelicerae, sternum, and mouthparts yellow; abdomen pale yellow, anterior surface covered with transverse purple stripe extending along sides three-fourths distance to spinnerets, connected medially to longitudinal purple stripe occupying about one-third of dorsal width at its widest point (fig. 200), venter without sclerotized patches; legs and palpi yellow. Eye diameter ratio, PME:ALE:PLE, 6:7:5; PME separated by 2.5 times their diameter, by slightly more than their diameter from PLE. Clypeal height at midpoint slightly greater than PME interdistance. Subcheliceral area of carapace unmodified. Chelicerae 0.47 long, 0.13 wide, slender, posterolateral surface with oblique patch of stridulatory ridges situated proximal of level of fang tip (fig. 131); promargin with two long and one short peg teeth (fig. 133), three additional short peg teeth opposite fang tip (fig. 134); cheliceral gland mound prominent, situated on retromargin at about two-thirds of fang length (figs. 134, 135), followed proximally by two extremely long, strong bristles originating near base of

paturon; fang evenly curved, tip directed dorsally. Palp with one small and one large stridulatory pick proximally on prolateral surface of femur (fig. 132), without spines. Endites longer than wide (2:1); labrum with median ventral and paired lateral dorsal protuberances; labium wider than long (2:1); sternum longer than wide (6:5).

	I	II	III	IV	Palp
Femur	0.58	0.43	0.45	0.60	0.24
Patella	0.14	0.14	0.12	0.18	0.09
Tibia	0.49	0.32	0.26	0.52	0.13
Metatarsus	0.46	0.27	0.29	0.47	—
Tarsus	<u>0.22</u>	<u>0.22</u>	<u>0.22</u>	<u>0.19</u>	<u>0.22</u>
Total	1.89	1.38	1.34	1.96	0.68

Gonopore without posterior flap, with lightly sclerotized transverse band along anterior rim; six small receptacula arising separately from coiled ducts (figs. 210, 211).

MALE: Unknown.

OTHER MATERIAL EXAMINED: CHILE: *Chiloé*: Chaitén, elevation 0–100 m., Berlese, concentrated forest moss, Dec. 7, 1981 (N. I. Platnick, R. T. Schuh, AMNH, OMD), 2f. *Llanquihue*: Lago Chapo, 11.7 km. E. Correntoso, elevation 320 m., disturbed Valdivian rainforest, Berlese of leaf and log litter, baited pitfall traps, Dec. 16–27, 1982 (A. Newton, M. Thayer, AMNH, MCZ), 2f; Lago Chapo, 13.5 km. E Correntoso, elevation 310 m., Valdivian rainforest, Berlese of leaf and log litter, window trap, Dec. 16–27, 1982 (A. Newton, M. Thayer, AMNH), 2f.

DISTRIBUTION: Known only from Chiloé and Llanquihue, Chile.

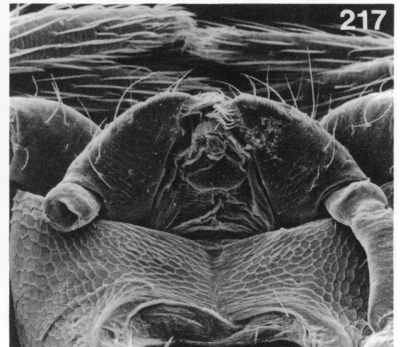
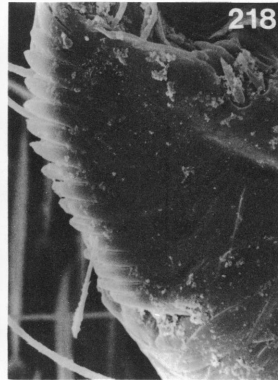
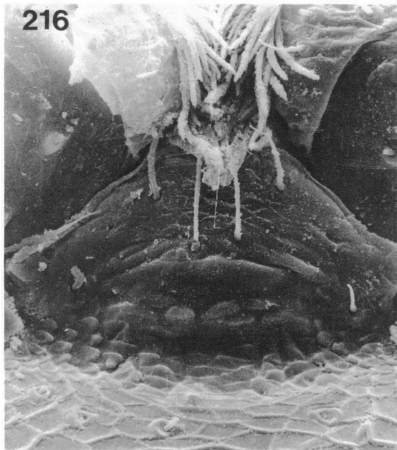
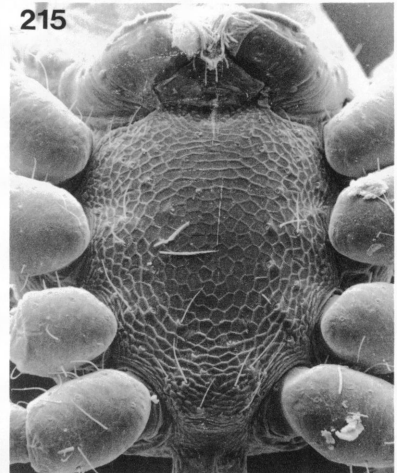
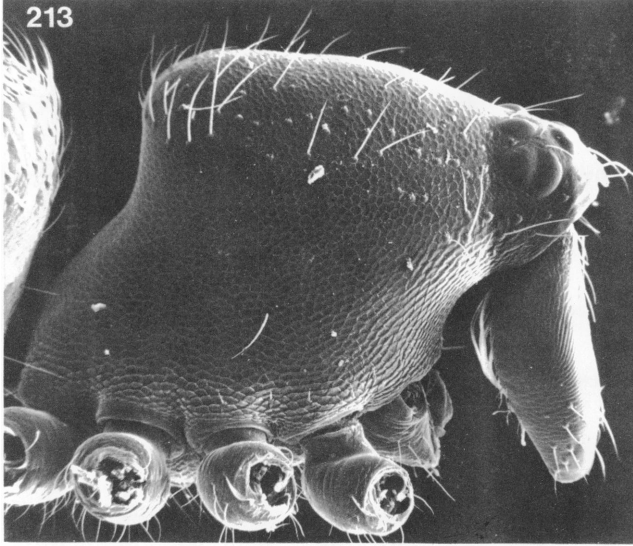
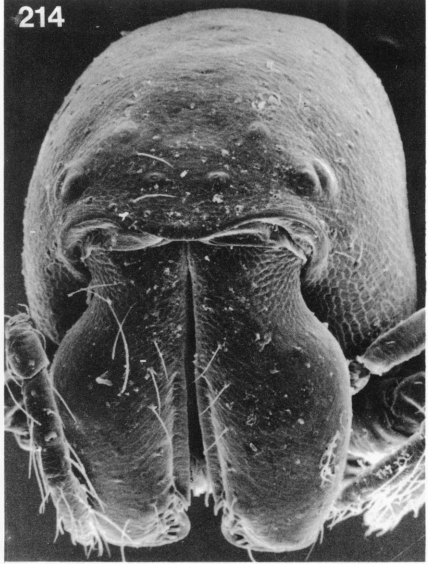
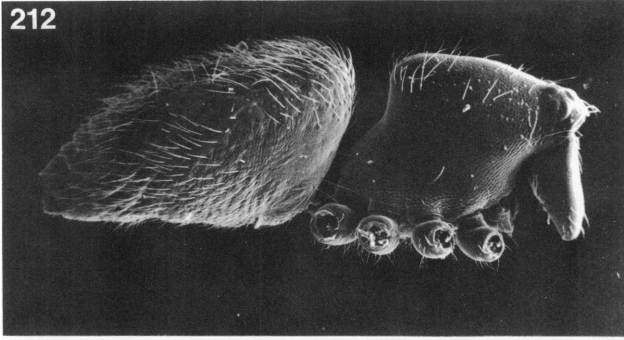
PARARCHAEIDAE, NEW FAMILY

Figures 212–219, 221–238

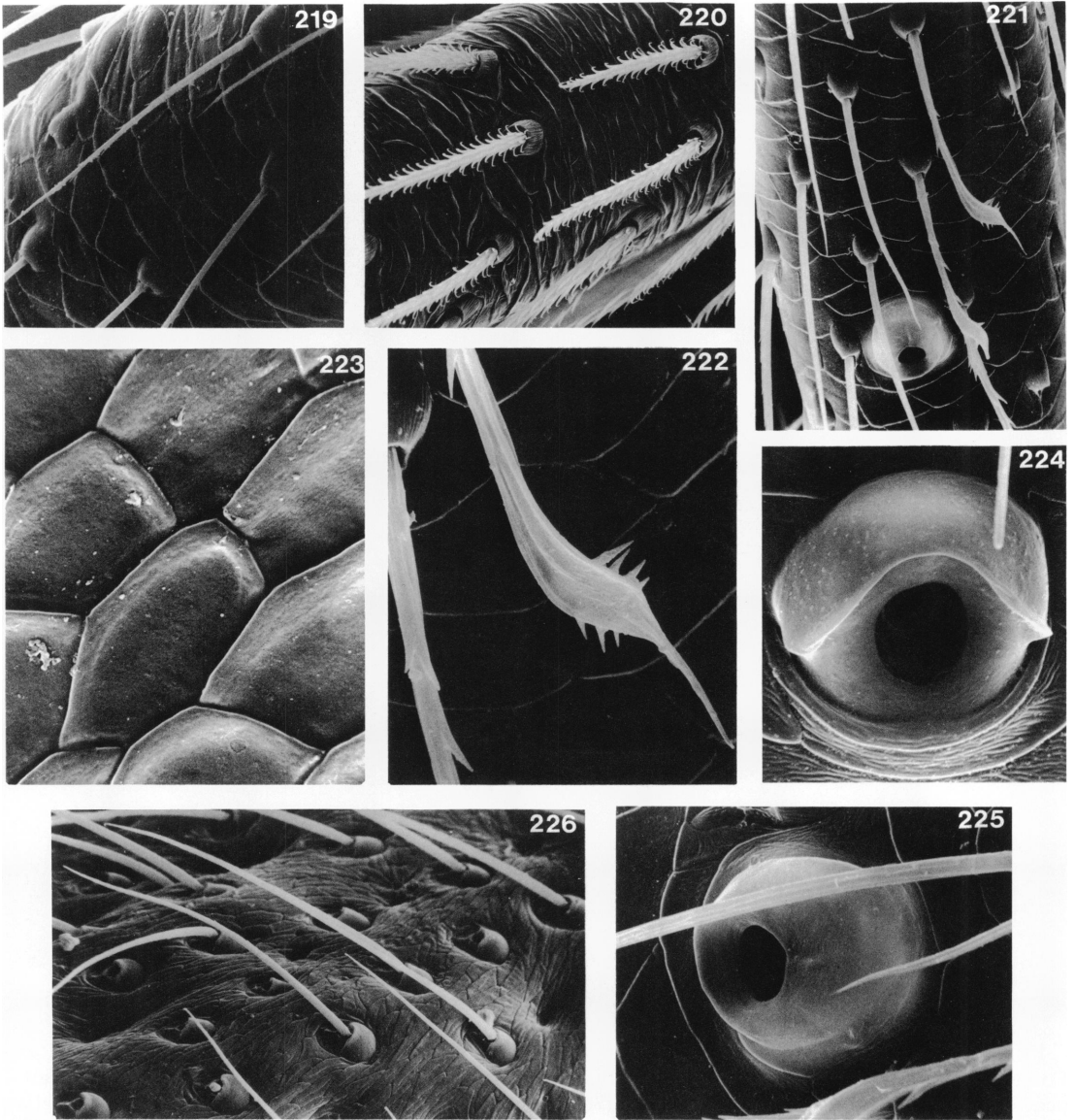
TYPE GENUS: *Pararchaea* Forster.

DIAGNOSIS: Pararchaeids can be distinguished from all other spiders by the combined presence of chelicerae originating from a completely sclerotized foramen in the carapace and entelegyne genitalia (females have a fertilization duct and males have a paracymbial process).

DESCRIPTION: Small, ecribellate, entelegyne, araneomorph spiders. Eight subequal eyes, in two rows (fig. 214); laterals contiguous, widely separated from medians; me-



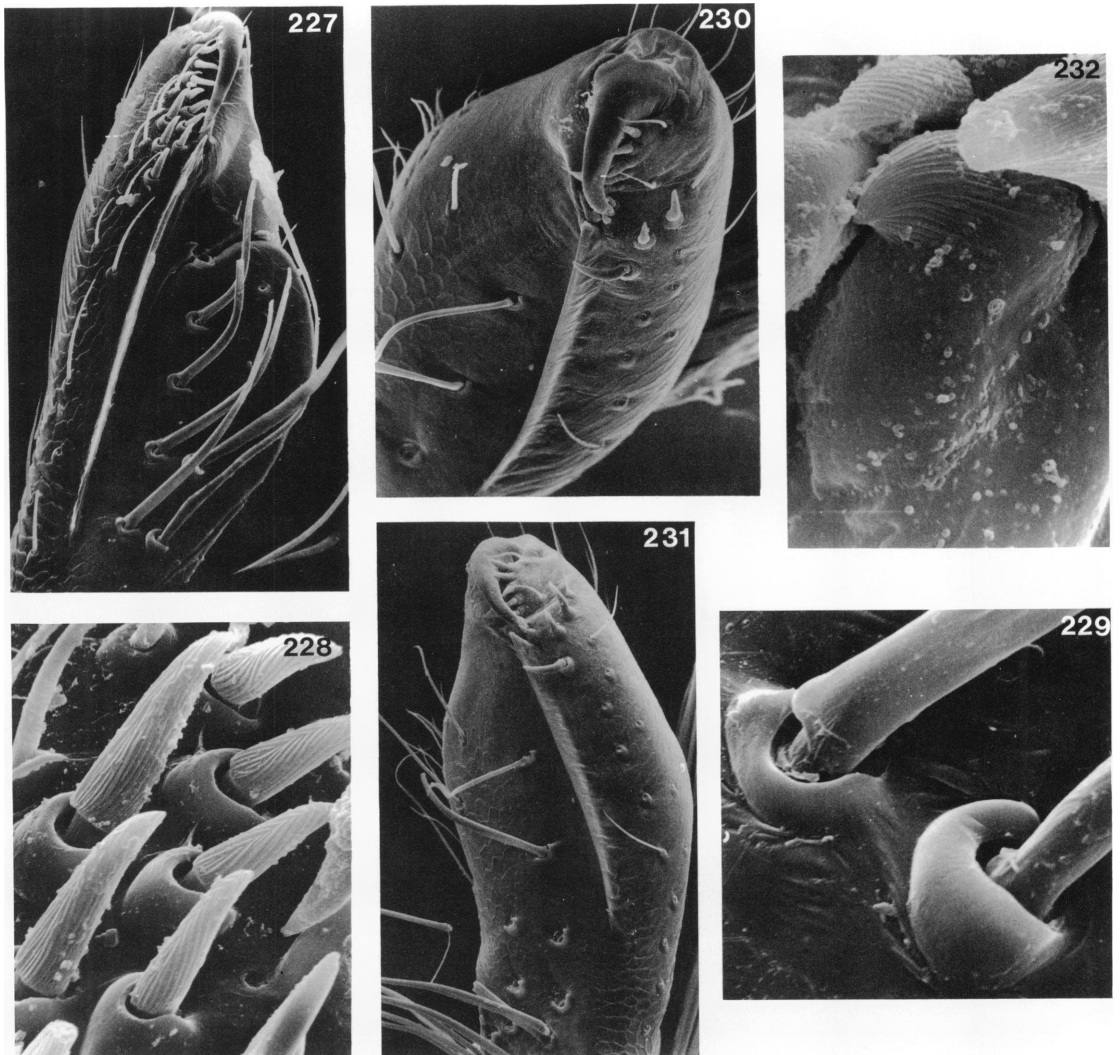
FIGS. 212–218. Pararchaeidae. 212, 213. *Pararchaea rubra* (Forster). 214–218. *P. alba* Forster. 212. Lateral view of body. 213. Lateral view of carapace and chelicerae; note the relatively large eyes (as compared to *P. alba*) and the typically reticulate surface of the carapace. 214. Head of female. 215. Sternum of female; note the obtuse posterior margin and wide separation of coxae IV. 216. Labium; note fusion to sternum. 217. Anterior portion of carapace from below, showing the median suture and the labrum. 218. Serrula.



FIGS. 219–226. Pararchaeidae and Mecysmaucheniidae. 219. *Pararchaea alba* Forster. 220. *Zearchaea fiordensis* Forster. 221–226. *Pararchaea rubra* (Forster). 219, 220. Tibia, showing familial differences in hair type and cuticular structure. 221. Tarsus I, showing modified hairs and tarsal organ. 222. Distal portion of a modified hair from tarsus I. 223. Integument of tarsus, showing the typical scalation. 224. Bothrium. 225. Tarsal organ. 226. Surface of abdomen, showing the typically slender, serrate hairs.

dian eyes well separated from each other. Carapace, viewed laterally, square or rhomboid (figs. 212, 213), finely reticulated or scaled, without tubercles or mounds. Anterior margin of carapace encircling base of chelicerae, which extend from oval foramen (fig.

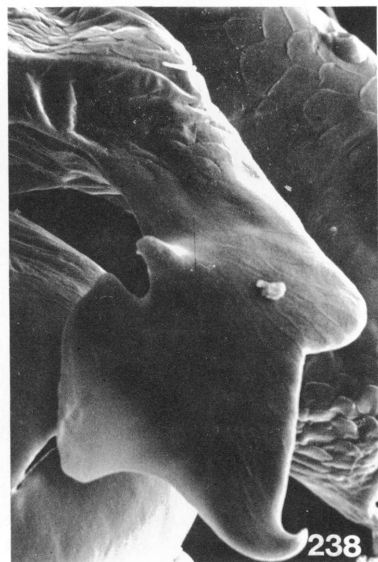
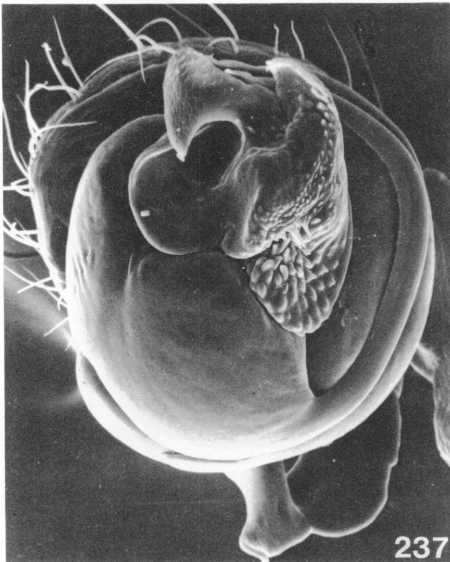
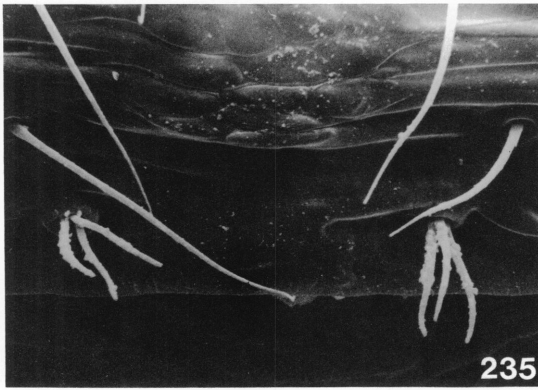
217); foramen without triangular sclerite. Chelicerae relatively long, stout, fang relatively short, furrow shallow, promargin with peg teeth, retromargin smooth; pronounced keel extends down ventral surface of paturon behind fang tip (figs. 227–231); below fang



FIGS. 227–232. Pararchaeidae: chelicerae. 227–229. *Pararchaea rubra* (Forster). 230–232. *P. alba* Forster. 227. Medial view, showing peg teeth, ventral keel, and strong retrolateral hairs. 228. Detail of peg teeth. 229. Base of retrolateral hairs. 230. Distal view. 231. Medial view. 232. Cheliceral gland mound, situated near fang tip and distal limit of ventral keel.

tip (immediately beyond distal portion of keel) surface raised, in some species associated with ridged spine apparently bearing opening of cheliceral gland (fig. 232); very long stout hairs on retromargin of paturon constricted proximally where they enter socket (fig. 229). Poison gland endocephalic. Stridulatory ridges sometimes present on outer surface of chelicerae (fig. 213), not as clearly defined as in

archaeids or mecysmaucheniids; at least some species with further stridulatory mechanism consisting of row of denticles on retrolateral surface of femur I which rub against file on prolateral surface of femur II. Endites directed across labium, which is triangular in outline and distinctly wider than long (figs. 215, 216); serrula well developed as single row of teeth (fig. 218). Labrum without lateral



FIGS. 233–238. Pararchaeidae: genitalia. 233, 234. *Pararchaea alba* Forster. 235–238. *P. rubra* (Forster). 233. Epigynum. 234. Internal female genitalia from above; note the multilobed internal cavity of each receptaculum. 235, 236. Epigastric region of male, with detail of epiandrous gland spigots. 237. Male palp from below; note the strong, curved embolus and the complex distal plate. 238. Paracymbial process.

protuberances. Sternum scutiform, not much longer than wide, obtuse posteriorly; coxae IV widely separated (fig. 215).

Abdomen oval, without tubercles; cuticle coriaceous in both sexes; petiole usually encircled by heavily sclerotized plate that may extend back to cover entire epigastric region; conspicuous sclerotic muscle attachment plates usually present on both dorsal and ventral surfaces; at least one species with dorsal scutum in males; anterior surface without stridulatory file; epiandrous glands represented by two bunches of spigots arising from cup on each side of epigastric furrow (figs. 235, 236). Abdominal hairs smooth or serrate (fig. 226). Six spinnerets, fully developed; anterior pair contiguous; colulus conical, with two hairs. Female genitalia with weakly developed epigynal plate (fig. 233); one or two intromittent pores present short distance in advance of epigastric furrow, leading into pair of thick-walled receptacula (fig. 234) which contain complicated systems of ducts and chambers; distinct fertilization ducts lead from receptacula into bursal cavity.

Legs not markedly slender, scaled, clothed with slender serrate or smooth hairs (figs. 219, 223); no scopula hairs or spines but some species with row of modified hairs on dorsal surface of tarsus (figs. 221, 222). Tarsi without ring of unsclerotized cuticle; three claws but no onychium; upper claws with single row of teeth, inferior claw with single tooth; few strong serrate hairs usually present at base of claws. Single trichobothrium on metatarsi; from two to four on tibiae; bothria strongly developed, with distinct, smooth posterior hood (fig. 224). Tarsal organ capsulate, conspicuous, relatively large (fig. 225). Female palp without claw. Male palp without accessory process on any segment except tarsus; spoon-shaped cymbium bearing large, retrolateral, basal paracymbial projection (fig. 238); bulb large, extending over full length of cymbium; embolus spinous, arising from base of bulb (fig. 237), curving around retrolateral margin to complex distal plate probably analogous in function to median apophysis of other spiders, presumably homologous to some or all of secondary processes of archaeids and mecysmaucheniids.

Number of heart ostia unknown. Respi-

ratory system consisting of anterior pair of booklungs and four simple tracheal tubes limited to abdomen, opening from distinct, often sclerotized, median spiracle immediately anterior of colulus; some species have lamellae of booklungs long and narrow but structure still that of pulmonary rather than tracheal organ.

INCLUDED GENERA: Only the type genus.

DISTRIBUTION: Australia (both eastern and western), Tasmania, New Zealand.

DISCUSSION: The Pararchaeidae is newly established to include those small spiders from Australia, Tasmania, and New Zealand which have previously been placed in the Archaeidae under the generic name *Pararchaea* Forster. Only seven species have been described but a number of as yet undescribed species are known from both Australia and New Zealand; all fall well within the family limits set out above.

The pararchaeids are similar to mecysmaucheniids in general appearance, carapace shape, and the form and dentition of the chelicerae. Apart from these presumably plesiomorphic characters and the retention of six spinnerets, however, the pararchaeids are more derived in almost all their features. They are entelegyne, with a definite although not very prominent epigynum associated with bireceptaculate internal genitalia from which short fertilization ducts pass to the bursal cavity. The male palp is also typical for an entelegyne spider, with the embolus strongly developed and associated with a large tegular plate. The cymbium bears a prominent paracymbial process similar to that found in the Mimetidae. The tarsal organ is capsulate and the bothrium is provided with a pronounced, smooth posterior hood. In addition the hairs are all serrate and thus contrast strongly with the typical haplogyne plumose hairs characteristic of the mecysmaucheniids.

NATURAL HISTORY: The pararchaeids are generally found in moss and litter in rainforest, often in the same habitats as mecysmaucheniids. Little is known of their natural history beyond the fact that they do not construct snares to capture their prey. In captivity they feed readily on the smaller invertebrates found in the same habitats, particularly collembola. Eggsacs have not been found.

PARARCHAEA FORSTER

Pararchaea Forster, 1955, p. 397 (type species by original designation *Pararchaea alba* Forster).

DISCUSSION: The first species recorded, from New Zealand, was placed in the mecysmaucheniid genus *Zearchaea*, as *Z. rubra*, by Forster (1949). It was not until six years later, when more abundant material was available for study from both Australia and New Zealand, that a separate genus *Pararchaea* was established by Forster (1955). At that time little was known of the female internal genitalia; the fact that the true mecysmaucheniids are haplogyne was not recognized and hence the association of this genus with the mecysmaucheniids was not questioned. In that paper two further species were described, one from New Zealand (*P. alba*) and the other from Queensland, Australia (*P. binnaburra*). Subsequently, Hickman (1969) described four more species from Tasmania (*P. corticola*, *P. ornata*, *P. saxicola*, and *P. bryophila*).

With the separation of the true archaeids from the mecysmaucheniids by other workers and the realization that neither *Pararchaea* nor *Holarchaea* could be directly associated with either of those taxa, it became obvious that an alternative home was required for them. Despite the undesirability of establishing family taxa for single genera, it is evident that as with other relict taxa (e.g., the "hypochiloid" families) there is no other alternative short of lumping the entire range of taxa into a single family Archaeidae.

HOLARCHAEIDAE, NEW FAMILY

Figures 239–259

TYPE GENUS: *Holarchaea* Forster.

DIAGNOSIS: Holarchaeids can be distinguished from all other spiders by having chelicerae originating from a foramen in the carapace that is outlined ventrally only by unsclerotized cuticle; the minute size, the absence of cheliceral peg teeth, and the apparent absence of a poison gland also readily distinguish holarchaeids from true archaeids, mecysmaucheniids, and pararchaeids.

DESCRIPTION: Minute (0.8–1.5 mm.) ecribellate, entelegyne, araneomorph spiders (fig.

239). Eight eyes, relatively large; AME smallest, others subequal; laterals contiguous, clearly separated from medians (fig. 240); medians separated from each other. Carapace with pars cephalica raised high above pars thoracica but not constricted to form neck (fig. 240); anterior margin extending down each side of chelicerae, connected ventrally by unsclerotized cuticle that completes the encirclement of bases of chelicerae so that those structures are enclosed in oval foramen (fig. 242); surface of carapace finely punctate or reticulate. Anterior portion of carapace between eyes and chelicerae strongly swollen to form distinct ridge projecting over base of chelicerae (fig. 241); cheliceral foramen without triangular sclerite ventrally between chelicerae. Chelicerae (figs. 250, 251) long, slender, fang long, at least one-third length of paturon (Hickman, 1981, records that in *H. globosa* the fang is only slightly shorter than the paturon), without stridulatory ridges or lateral boss; furrow only weakly defined, promargin with two or three small, slender teeth, without peg teeth; cheliceral gland mound well developed, situated near fang tip (fig. 250), with few pores, usually associated with single tooth; fang divided at one-third its length by transverse groove, narrowing distally to sharp point bent down toward cheliceral furrow. No opening on fang for poison gland, which is therefore presumed absent. Endites longer than wide, directed across labium, not meeting at midline (fig. 258); serrula well developed as single row of strong teeth (fig. 259); labium strongly rebordered (fig. 258). Labrum without lateral protuberances. Sternum scutiform, longer than wide, widely obtuse posteriorly; coxae IV separated by almost twice their width (fig. 258).

Abdomen globose, without surface swellings or scuta (fig. 239); cuticle thin. Abdominal hairs short, weakly serrate. Six well-developed spinnerets with very few spigots; anteriors strongest, subcontiguous (fig. 257); colulus distinct, linguiform, with two hairs (fig. 257). Female genitalia with single opening shortly anterior of epigastric furrow, leading into pair of spherical, sclerotized receptacula from each of which a fertilization duct extends back to bursal cavity (fig. 243).

Legs slender, clothed with smooth or weak-

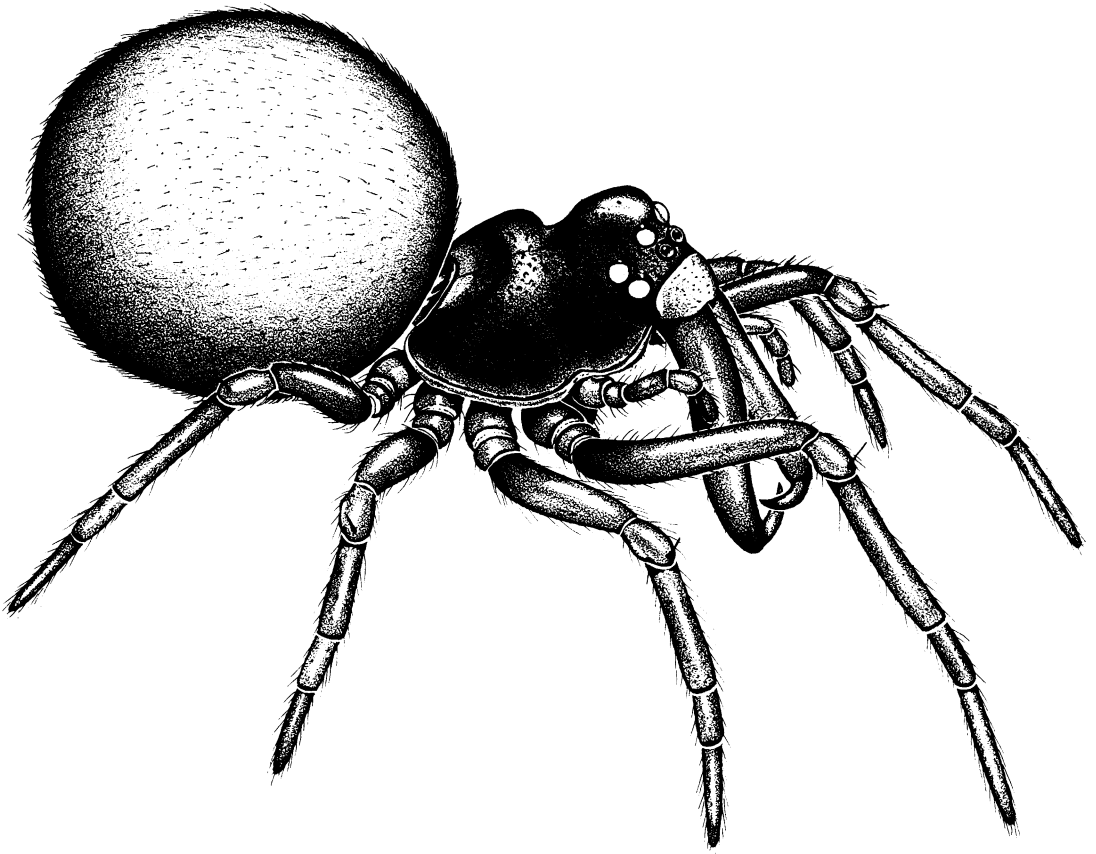


FIG. 239. Holarchaeidae: *Holarchaea novaeseelandiae* (Forster), female.

ly serrate hairs, without spines; no scopula hairs or claw tufts present; metatarsi not elongate. Tarsi without ring of unsclerotized cuticle, those of legs I and II swollen, with group of modified hairs beyond tarsal organ (figs. 244, 245) and a number of low mounds below hairs (fig. 246); claws reduced on legs I and II; three smooth claws on legs III and IV, superiors long, slender, inferior shorter, slender (fig. 249). Single trichobothrium on metatarsi, two or three on tibiae; bothria with smooth hood (fig. 247). Tarsal organ capsulate (fig. 248). Female palp without claw, small, with tibia and tarsus partially fused. Male palp with strong, coiled embolus encircling bulb two or three times (figs. 252, 253, 255); surface within coils raised and smooth except for short lobe near base of embolus; cymbium spoon-shaped, without paracymbial or other processes, with numerous curved

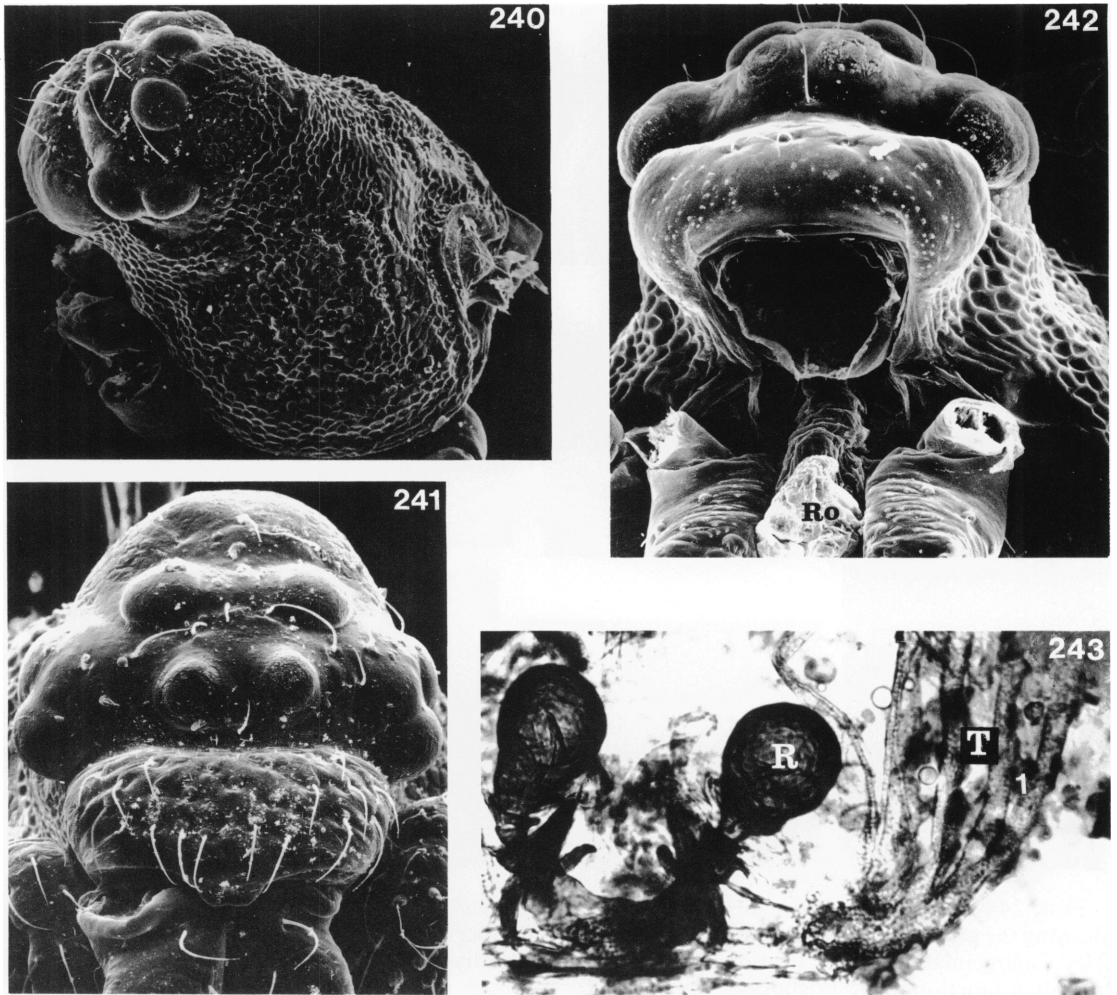
hairs (fig. 254); tibia with two spinous processes on distal retrolateral surface (fig. 256).

Number of heart ostia unknown. Respiratory system without posterior spiracle; anterior spiracles leading into short trunk from which eight or nine relatively large, thin-walled tracheal tubes extend directly forward but are limited to abdomen (fig. 243); these tracheal structures could equally well be termed reduced lamellae and represent an intermediate state such as occurs in some Anapidae (Forster, 1959), where the transformation from booklung system into tracheae remains incomplete.

INCLUDED GENERA: Only the type genus.

DISTRIBUTION: New Zealand and Tasmania.

DISCUSSION: Because the holarchaeids are so small and are so rarely found in numbers, it was not possible to be certain of a number

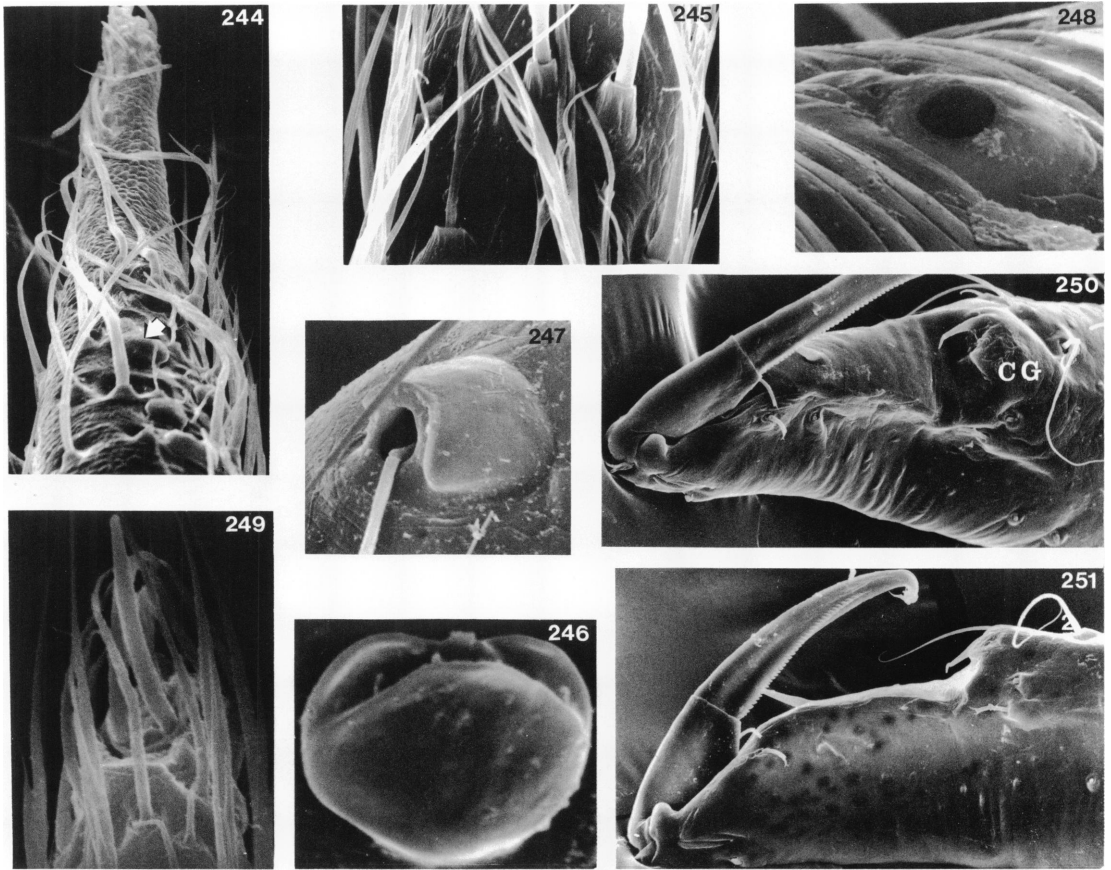


FIGS. 240–243. *Holarchaeidae: Holarchaea novaeseelandiae* (Forster). 240. Lateral view of carapace, showing the reticulate cuticular sculpturing and the absence of a fovea. 241. Head and clypeus; note the swollen clypeus with a median protuberance. 242. Anterior view of carapace with chelicerae removed; note the wrinkled, lightly sclerotized cuticle between the cheliceral foramen and the labrum (Ro). 243. Anterior portion of abdomen from above (cleared); note the paired receptacula (R) and the relatively large tracheal tubes (T) which retain some of the characteristics of the original lamellae.

of characters at the time the first species was described (from New Zealand) as an *Archaea* by Forster (1949). Indeed it is only recently, with the development of new techniques for internal examination and the availability of scanning electron microscopes, that any reasonable level of certainty has been reached.

During the initial examination of cleared specimens under a light microscope it appeared that the fang lacked an opening for the passage of venom, but this observation

was not recorded at that time. Re-examination under a scanning scope, however, has also failed to demonstrate a duct aperture and it must be concluded that (along with the *Uloboridae* and *Heptathela*) a poison gland is absent in these spiders. Typical peg teeth are not present along the promargin but there are often two or three stout setae which could be vestigial remnants of those structures. The true teeth are also few in number and weakly developed; when these factors are linked with



FIGS. 244–251. *Holarchaeidae*: *Holarchaea novaeseelandiae* (Forster). 244. Distal portion of tarsus, showing the group of modified hairs associated with a number of structures of unknown function (arrow). 245. Enlargement of distal portion of modified tarsal hairs. 246. Enlargement of tarsal structure of unknown function. 247. Trichobothrium. 248. Tarsal organ. 249. Distal portion of tarsus III, showing the smooth, slender superior claws. 250, 251. Chelicera of male; note the small tooth near fang base and gland mound (CG) near fang tip.

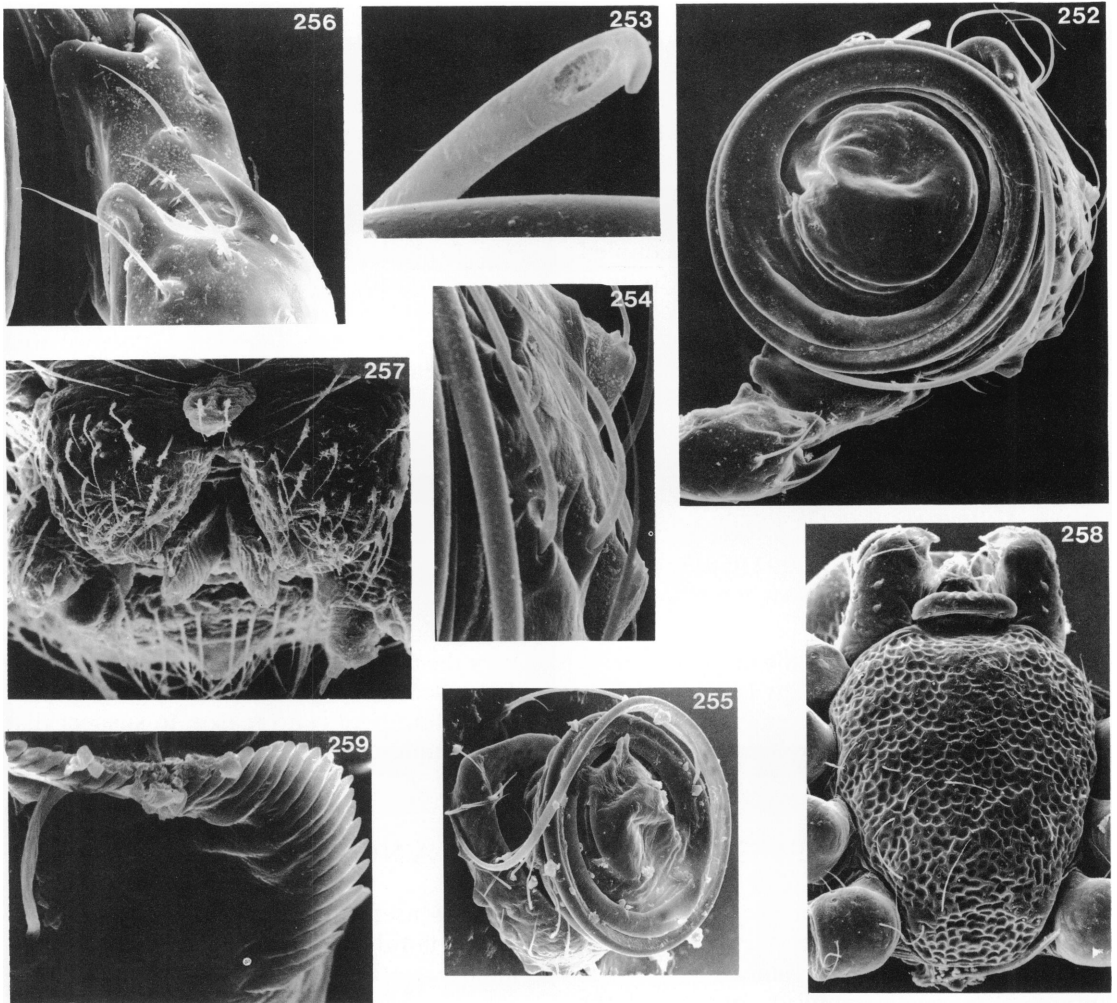
the apparent absence of venom and the tiny size of the spiders it is difficult to speculate on what prey they capture.

The absence of a posterior spiracle was noted in the original description but the respiratory system was not examined. The fact that the anterior booklungs are strongly modified and could be interpreted as a tracheal system is not unexpected in view of what we now know about the types of respiratory modifications to be found in many of the smaller spiders.

The female internal genitalia have only recently been examined and the presence of an external intromittent pore and internal fer-

tilization ducts recorded, thus establishing the genitalia as being fully entelegyne. Externally there is only a slight thickening of the epigastric region, scarcely different from that found in many haplogyne spiders.

The thickening of the tarsi of the anterior legs was also recorded earlier, along with the presence of a clump of strongly ciliate hairs. Hickman (1981) recorded a similar modification of the tarsi in the Tasmanian *H. globosa* but (being limited to low magnification) he did not see the modified setae which are probably also present. The presumed sensory organs on the surface of the tarsi between these hairs (fig. 246) are unlike any other



FIGS. 252–259. *Holarchaeidae*: *Holarchaea novaeseelandiae* (Forster). 252. Ventral view of male palp. 253. Tip of embolus. 254. Portion of cymbium, showing the curved hairs arising from prominent, raised bases. 255. Partly expanded bulb of male palp. 256. Patella and tibia of male palp, showing the two distal prolateral patellar processes. 257. Spinnerets and colulus. 258. Ventral surface of cephalothorax; note the strongly rebordered labium. 259. Serrula.

structures thus far recorded and are not present in other palpimanoid spiders. A similar swelling of the tarsal segment is found in some of the *Pararchaeidae* (e.g., *Pararchaea bryophila* Hickman), whereas modified tarsal hairs are also found in other species, such as *Pararchaea rubra* Forster. The association of these features present in *Holarchaea* is unique to this genus, however.

The form of the carapace, with its differential elevation of the head, is reminiscent of the archaeids rather than the other two re-

lated families. In all three of these families, however, the incomplete fusion of the carapace beneath the chelicerae is found only in the early instars and does not persist in adults as it does in the *Holarchaeidae*.

NATURAL HISTORY: These spiders are restricted to habitats which have a relatively high and constant humidity. In New Zealand they are generally found in the moss and litter of wet rainforest, but they have also been collected from litter at the base of clumps of tussock in grasslands where the humidity level

is also high. Because they are rarely captured alive (almost all specimens in collections were taken in Berlese funnel samples) nothing is known directly of their natural history. The paucity of the silk spigots (there are only three on each spinneret in *H. novaeseelandiae*) would suggest that they do not construct a snare, and the absence of poison glands and the peculiar features of the chelicerae coupled with their minute size would appear to limit the prey they might capture. The only groups of invertebrates occupying the same habitats which appear to fall into the possible prey range are the collembola or acari (unless one goes below this size range to such animals as the tardigrades).

HOLARCHAEA FORSTER

Holarchaea Forster, 1955, p. 392 (type species by original designation *Archaea novaeseelandiae* Forster).

DISCUSSION: At the time the original species was described (in *Archaea*) by Forster (1949), it was noted that the species is quite unlike the other species of the genus in which it was

temporarily placed. Subsequently (Forster, 1955), the species was transferred to the new genus *Holarchaea* but was still retained in the Archaecidae. Since that time, numerous specimens have been collected in New Zealand (from Three Kings Islands in the north to Stewart Island in the south, but not in the subantarctic islands), all of which share with *H. novaeseelandiae* the characters listed above in the family description. More recently, Hickman (1981) described from Tasmania a second species (as *Zearchaea globosa*) that thus extends the range of the family and lends support to the suggestion that these spiders are a relictual group. Because Hickman had only a single female specimen and we have seen only one male from Tasmania (AMNH), it has not been possible to confirm a number of the internal characters in the Tasmanian representatives. As all the external features recorded show very close correspondence to those of the New Zealand representatives (even the male palp differs mainly in the shape of the accessory processes on the proximal segments), there is no reason to suspect that radical differences exist.

THE OTHER PALPIMANOIDS

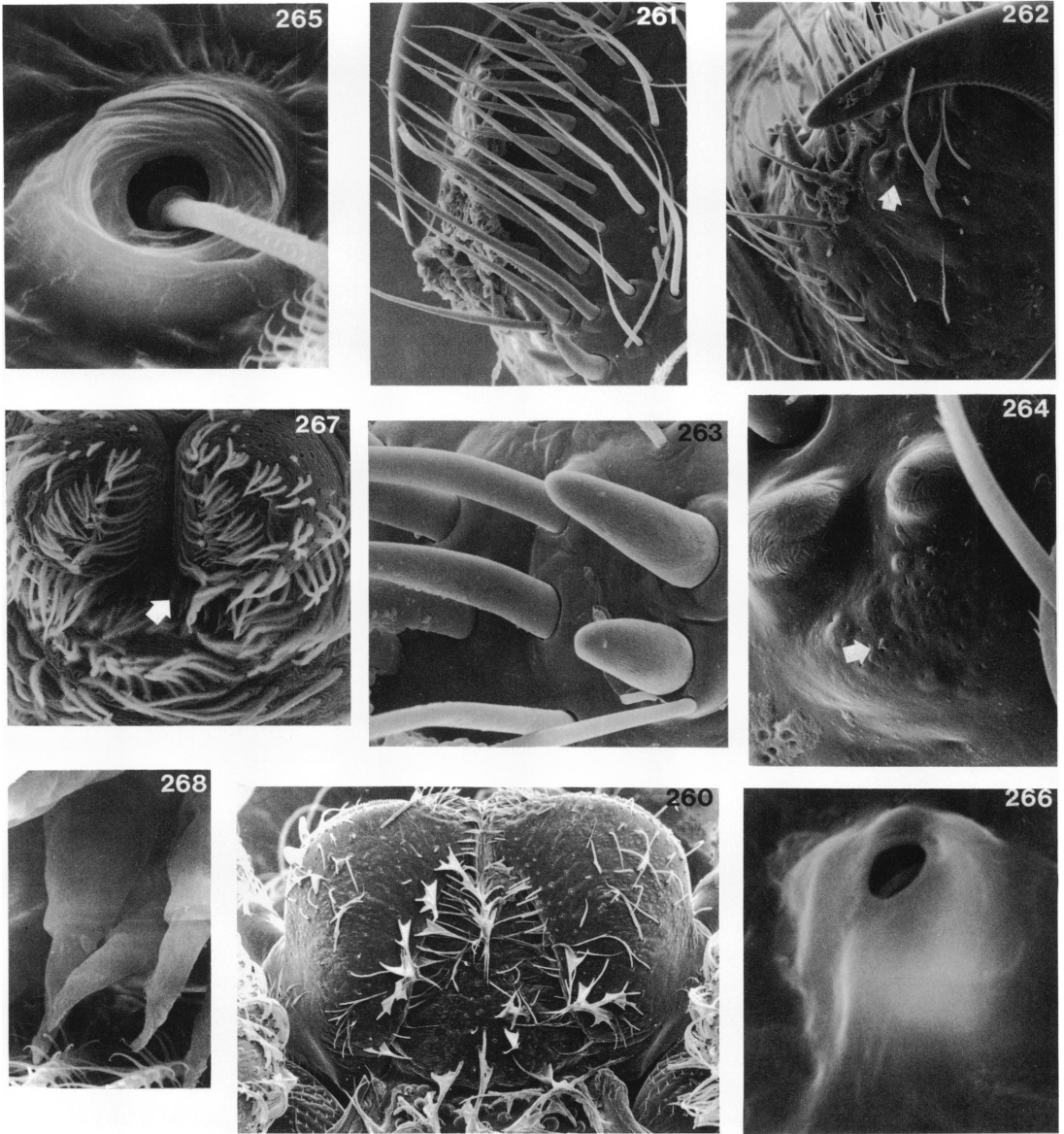
The primary synapomorphy which we suggest links the Archaecidae, Mecysmauchenidae, Pararchaeidae, and Holarchaeidae is the prolongation of the anterior margin of the carapace to encircle the base of the chelicerae. A second characteristic common to all of these families (except the Holarchaeidae) is the presence of peg teeth on the promargin of the cheliceral furrow, and it is this character (together with the raised cheliceral gland mound) which may provide a clue to the wider relationships of this group of families. The other families which share these cheliceral features are the Palpimanidae, Stenochilidae, Hutoniidae, Tetricellidae, Micropholcommatidae, and Mimetidae. The first three of these families have generally been considered to be closely related to each other, but the relationship of those taxa with the latter three families is a novel, and more tenuous, suggestion. Before enlarging on our proposals regarding the interrelationships of these taxa,

it seems useful to present a brief review of the six families we suggest should be associated with the four archaecid families.

THE PALPIMANIDAE

Figures 260–276, 279–297, 302, 303

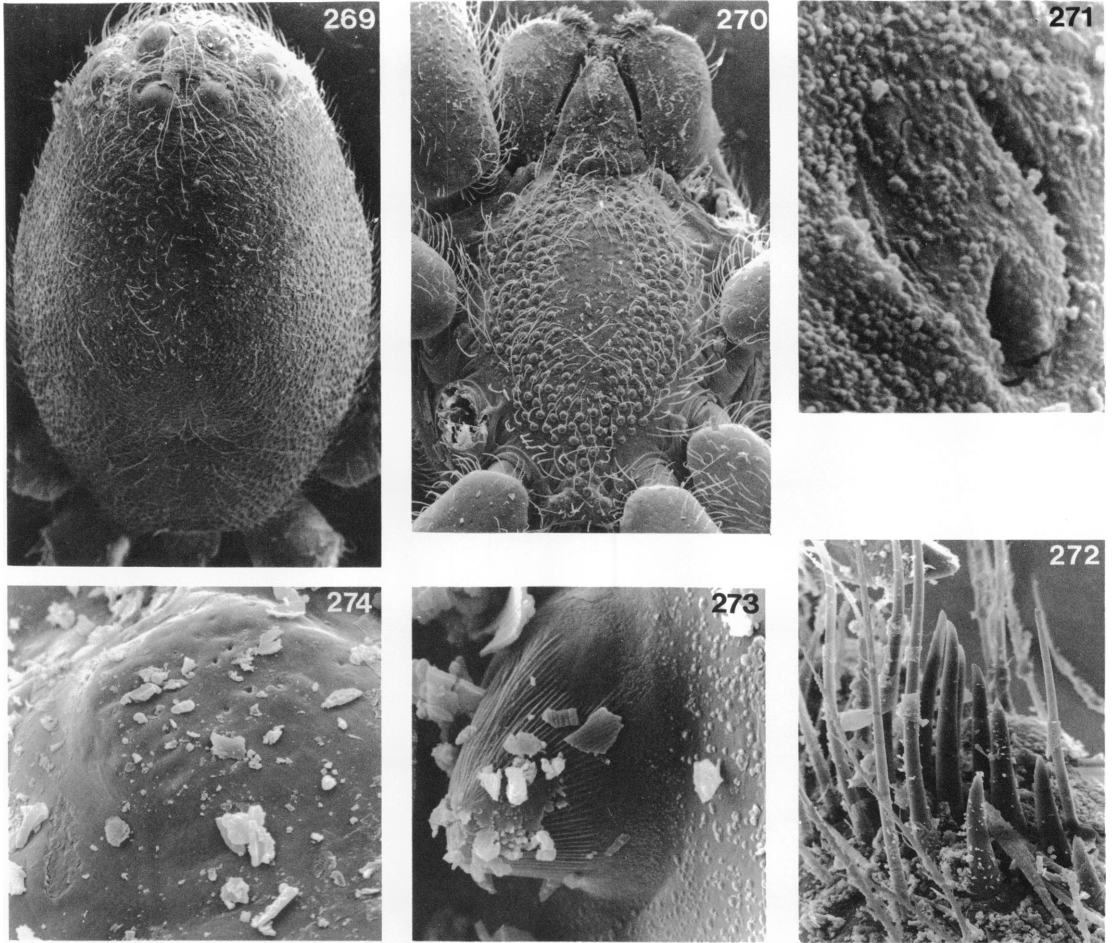
The palpimanids are medium-sized spiders. The carapace is always heavily sclerotized, strongly rugose or tuberculate, and sub-oval in outline, with the head region evenly rounded and sloping gently back to the thoracic region (fig. 269). The fovea is usually distinct but in contrast to the stenochilids is always single (fig. 283). There are eight (fig. 282) or six eyes with the missing pair being the PME (in *Hybosida* Simon). The lateral eyes are contiguous in the Otiiothopinae and Chediminae but widely separated in the Palpimaninae. The chelicerae are short and stout, directed down vertically below the anterior margin of the carapace. The cheliceral furrow



FIGS. 260–268. Palpimanidae: *Palpimanus gibbulus* Dufour. 260. Labium and endites. 261. Prolateral view of chelicera, showing the peg teeth. 262. Distal view of chelicerae; arrow indicates the position of the gland mound. 263. Peg teeth. 264. Cheliceral gland mound (arrow) with the two adjacent true teeth. 265. Trichobothrium. 266. Tarsal organ. 267. Spinnerets of female, showing the large anterior pair and the row of spigots (arrow) representing the median and posterior pairs. 268. Enlargement of three of the spigots.

is weakly developed or absent and the fang is short and stout (figs. 261, 286, 290), with the poison gland extending into the cephalothorax. Peg teeth are usually present along the promargin and opposite the tip of the fang

(figs. 263, 272, 292, 293). True teeth may be present on the retromargin but are never numerous (fig. 273); they are usually squat and longitudinally ridged. The cheliceral gland opens from a low mound on the retromargin

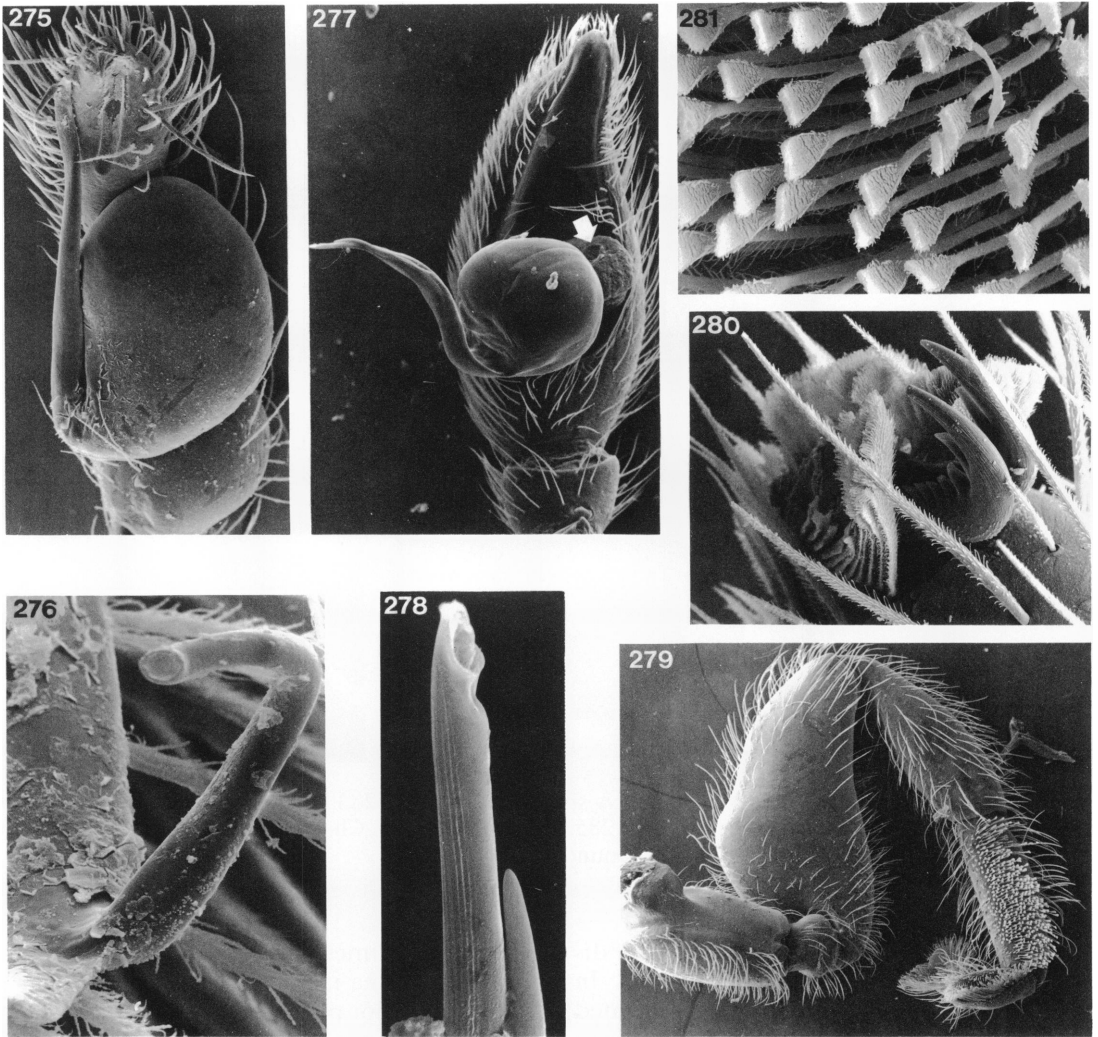


FIGS. 269–274. Palpimanidae: *Otiothops macleayi* Banks. 269. Carapace of female. 270. Sternum, endites, and labium of female. 271. Tarsal organ. 272. Cheliceral peg teeth near fang tip. 273. True cheliceral tooth on retromargin. 274. Cheliceral gland mound.

near the tip of the fang and (as in the Archaeidae) is often associated with a tooth (figs. 262, 264, 274, 287, 291). It never forms a prominent lobe as in the stenochilids. The labium is triangular in outline and separated from the sternum by a distinct groove (figs. 260, 270). The endites are directed across the labium and meet at the midline. There is a strong serrula consisting of a single row of teeth. The sternum is scutiform, not much longer than wide, and usually strongly granulate or tuberculate (fig. 270).

The cuticle of the abdomen is often coriaceous but the epigastric region is invariably heavily sclerotized, forming a scute which ex-

tends dorsally to encircle the petiole. The abdomen is ovate and does not bear any mounds or tubercles. The hair cover is uniform, consisting of plumose hairs. The posterior and median pairs of spinnerets are reduced to spigots (figs. 267, 268); the anterior pair are fully developed. The spinnerets are usually encircled by a sclerotic ring. There are two booklungs and a single tracheal spiracle which is situated near (but distinctly separated from) the spinnerets. The spiracle is usually sclerotized around its margin. The apodemal element of the tracheal system is always more or less fused and vestigial (figs. 302, 303). The pulmonary element is represented by two

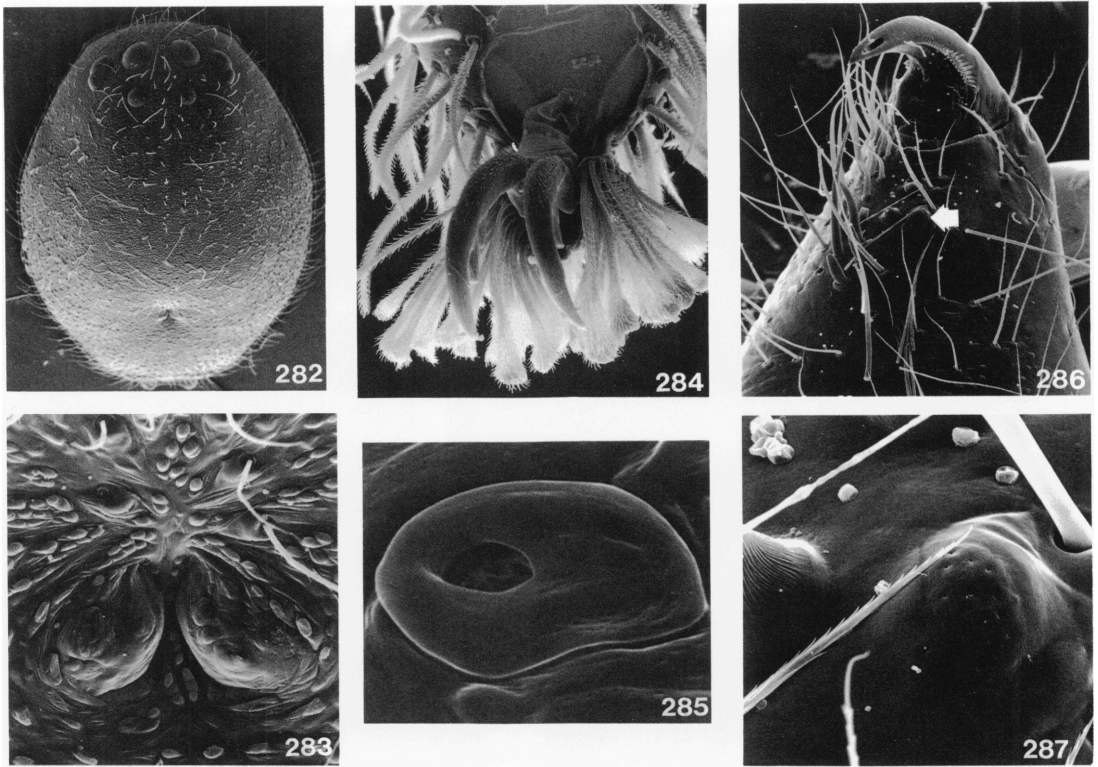


FIGS. 275–281. Palpimanidae and Huttoniidae. 275, 276, 279–281. *Otiotrops macleayi* Dufour. 277, 278. *Huttonia* sp. 275. Male palp; note excavation of distal surface of cymbium in which embolus normally rests. 276, 278. Distal portion of embolus. 277. Male palp; note the haematodocha (arrow) and the excavated distal region of the cymbium. 279. Prolateral view of leg I. 280. Tarsus II, showing claws and claw tufts. 281. Spatulate hairs from scopula on tibia I.

forms. In the Otiotropsinae and Chediminae there are numerous slender tracheae arising from a broad atrium on each side (fig. 303); these tracheae are limited to the abdomen. In the Palpimaninae there is only a single lateral trachea on each side, also limited to the abdomen (fig. 302).

The female genitalia are comparatively uniform. In most genera there are large paired membranous sacs associated with a basal

sclerotic plate. The two sacs open into a common atrium. Near the base of each sac there is a large secretory gland which discharges into the sac through a localized poreplate (figs. 295, 296). In addition there are small spherical lateral receptacula, each of which communicates with the common atrium by means of a long duct. It appears, however, that the divided median receptaculum may not be plesiomorphic for the family because in



FIGS. 282–287. Palpimanidae: *Scelidocteus* sp. 282. Carapace. 283. Fovea. 284. Distal portion of tarsus II, showing paired claws and claw tufts. 285. Tarsal organ. 286. Chelicera; arrow indicates position of the gland mound. 287. Cheliceral gland mound.

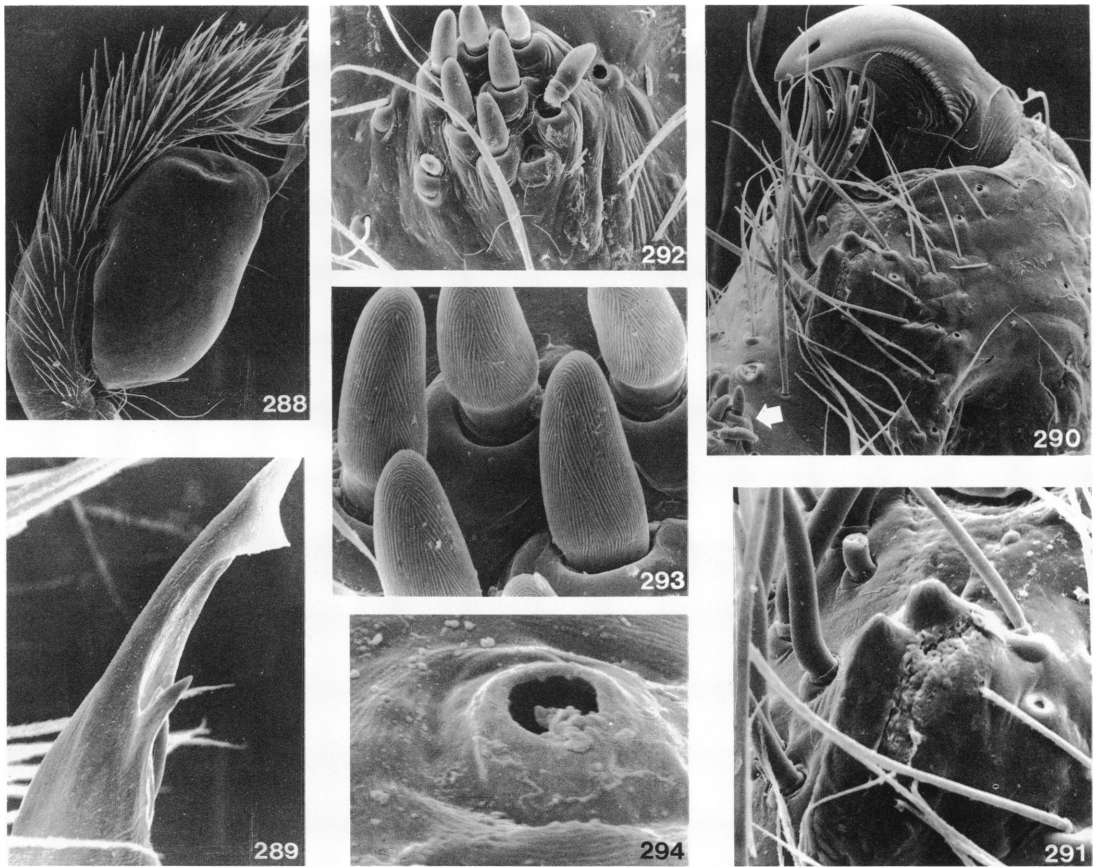
Boagrius (fig. 297) the median sac is undivided as it is in *Stenochilus* (fig. 298). In *Boagrius* the secretory glands are associated with the sclerotic plate rather than the median receptacula, and open directly into the common atrium.

The male palp lacks processes on any proximal segment; although the cymbium is usually well developed it is not excavated below as in the *Stenochilidae*. There are a wide range of bulbal forms ranging from some with a number of accessory processes in addition to the embolus to others where there is a single spinous embolus leading out from a smooth bulb (figs. 275, 276, 288, 289). Where a single process is present, the distoventral surface of the cymbium may act as a conductor. It is presumed that the complex bulb is plesiomorphic to the family and that the loss of the accessory processes may have occurred a

number of times. Unlike the *stenochilids*, a haematodocha is never present.

The anterior pair of legs are much stronger than the other three pairs (fig. 279) and the metatarsi and tarsi are reduced in size while the patellae are elongate. There is a thick scopula of distally spatulate hairs on the pro-lateral surface of the tibia, metatarsus, and tarsus (figs. 280, 281). Claws are generally reduced to two but three are present in some genera (fig. 284). A single trichobothrium occurs on the metatarsus and a few on the tibia. The posterior hood of the bothrium is generally reduced to a narrow ridge (fig. 265). The tarsal organ is capsulate (figs. 266, 271, 285, 294). The female palp lacks a claw.

The palpimanids are widely distributed through most of the tropical and subtropical regions of the world but have not been recorded from Australia.



FIGS. 288–294. Palpimanidae: *Anisaedus stridulans* González. 288. Male palp. 289. Tip of embolus. 290. Prolateral view of the chelicera; arrow indicates peg teeth. 291. Cheliceral gland mound. 292, 293. Enlargements of peg teeth opposite fang tip. 294. Tarsal organ.

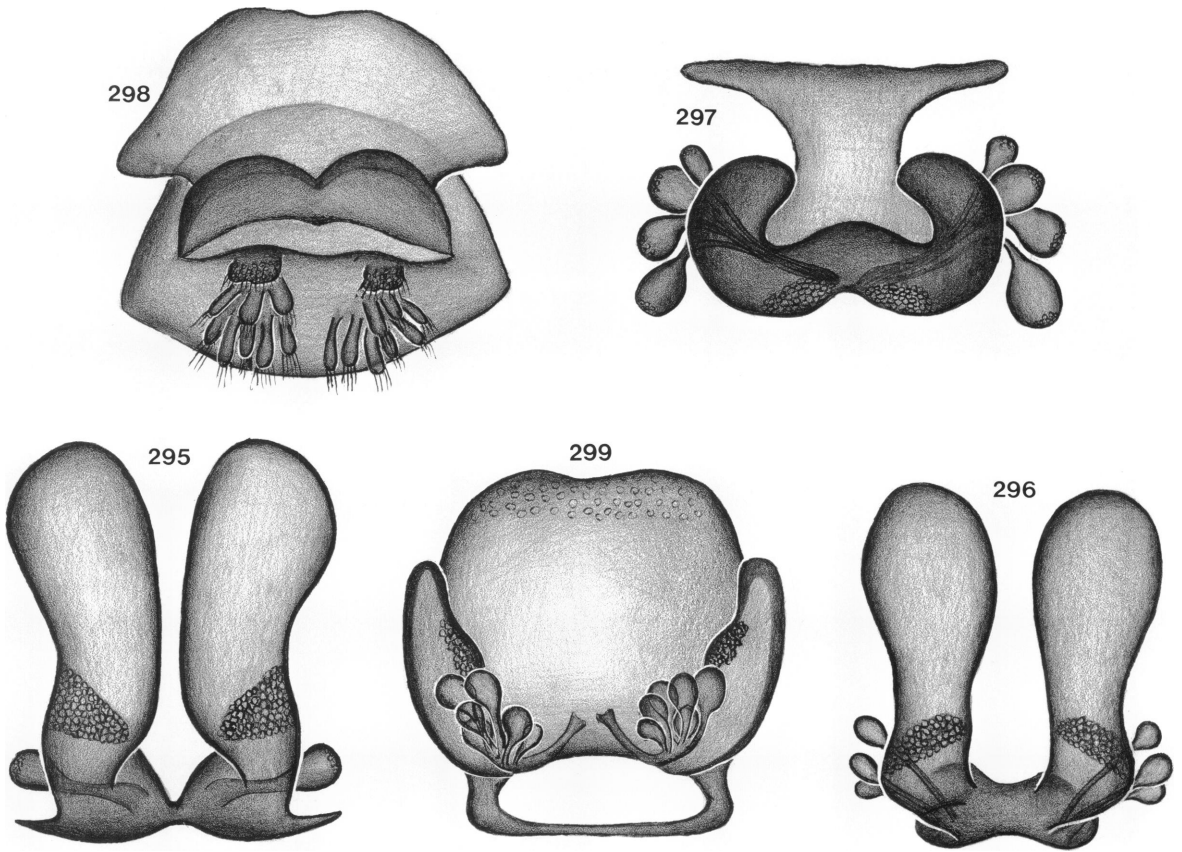
THE STENOCHILIDAE

Figures 298, 300, 301, 308–327

The stenochilids, sometimes previously considered a subfamily of the Palpimanidae, have recently (Platnick and Shadab, 1974) been re-elevated to family rank. Their distribution is not as wide as the typical palpimanids and few specimens have been found. Only two genera are recognized. The type genus *Stenochilus* is recorded from India and Burma while the second genus *Colopea* has been found in Burma, Thailand, Malaysia, Singapore, Borneo, the Philippines, Bali, Papua New Guinea, and Fiji (Lehtinen, 1982), as well as in northern Queensland (V. E. Davies, personal commun.).

They are small to medium-sized (body

length 3.5–10 mm.) haplogyne spiders. The carapace is diamond-shaped in outline, with the fovea elongate and constricted in the middle so that there are two deep foveal depressions (figs. 308–310). The cuticle is heavily tuberculate. The eight eyes are spaced more closely than in the palpimanids, with the laterals distinctly separated. In contrast to the palpimanids, the PME are usually larger than the AME. The chelicerae are short and stout as in the palpimanids but there are neither true nor peg teeth and the furrow is not developed (figs. 319, 321, 322, 324). The cheliceral gland mound is a large, relatively slender lobe situated immediately beyond the tip of the fang in *Colopea* (figs. 322, 325) and on the mid-retromargin in *Stenochilus* (figs. 319,



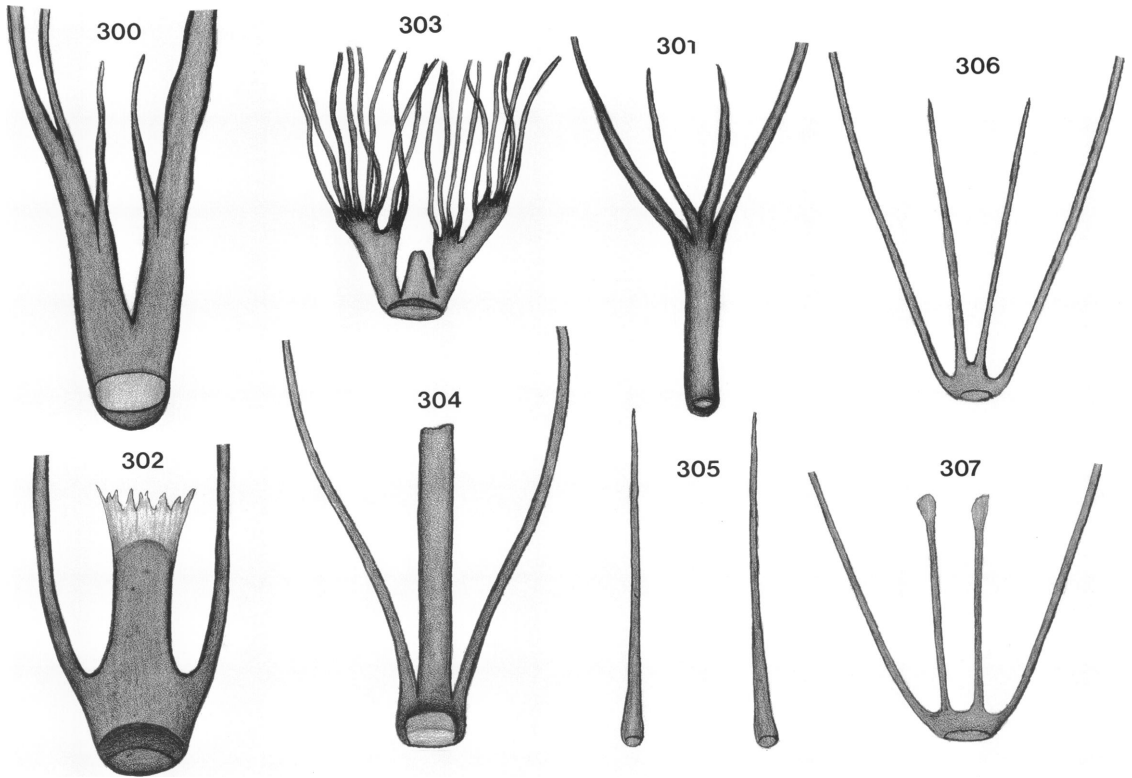
FIGS. 295–299. Palpimanidae, Stenochilidae, and Huttoniidae: internal female genitalia. 295. *Otiotrops macleayi* Banks. 296. *Palpimanus gibbulus* Dufour. 297. *Boagrius* sp. 298. *Stenochilus hobsoni* O. P.-Cambridge. 299. *Huttonia palpimanooides* O. P.-Cambridge.

320). The endites and labium are similar to those of the palpimanids but the labium is fused to the sternum (fig. 314). The serrula is composed of a single row of teeth. The sternum is scutiform with sclerotic extensions between the coxae (fig. 313). The abdomen is ovoid, without tubercles, and evenly clothed with plumose hairs (fig. 316). The epigastric region is covered with a sclerotized plate which, however, does not encircle the petiole as in the palpimanids. The spinnerets are similar to those of the palpimanids, with the anterior pair fully developed and the median and posterior pairs reduced usually to four discrete groups of spigots, which may be even further reduced in males.

The tracheal spiracle is single and, as in the palpimanids, situated in advance of the spin-

nerets (fig. 315); the tracheal structures, however, have developed along a slightly different line. The apodemal lobes, while retaining some evidence of their original paired origin, have fused with the pulmonary elements to form a compound organ which extends only a short distance in advance of the spiracle (figs. 300, 301).

The female genitalia of only one species of *Stenochilus* have been examined in detail and while this organ is superficially distinct from the range found in the Palpimanidae the same elements are present (fig. 298). The median receptaculum is present but is not divided. The receptacula are bilaterally grouped and numerous but more irregular in form than in the palpimanids, and have only short connecting ducts. The secretory glands are as-



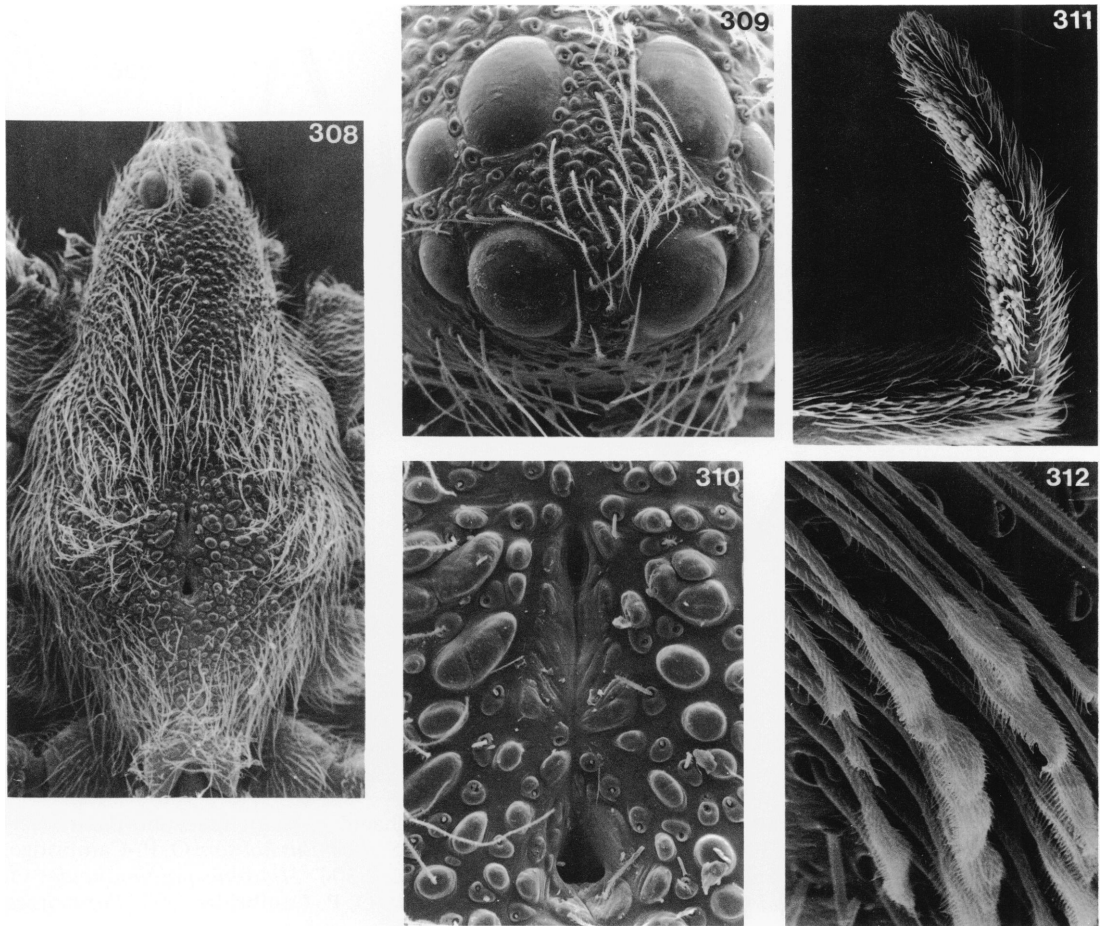
FIGS. 300–307. Stenochilidae, Palpimanidae, Huttoniidae, Archaeidae, Mimetidae, and Pararchaeidae: posterior tracheal systems. 300. *Colopea pusilla* (Simon). 301. *Stenochilus hobsoni* O. P.-Cambridge. 302. *Palpimanus gibbulus* Dufour. 303. *Otiothops macleayi* Banks. 304. *Huttonia palpimanoides* O. P.-Cambridge. 305. *Archaea vadoni* Millot. 306. *Mimetus mendicus* O. P.-Cambridge. 307. *Pararchaea alba* Forster.

sociated with the sclerotic plate rather than the median receptaculum in much the same way as in the Huttoniidae (but this is also the situation in the palpimanid *Boagrius*).

The male palp is strikingly different from the palpimanids but very similar in some ways to that of the Huttoniidae. The cymbium is spoon-shaped and deeply excavated below, where the bulb rests (fig. 317) so that in *Stenochilus* it is almost concealed when at rest. The embolus is inconspicuous and associated with a number of accessory processes (fig. 323). In common with the huttoniids, there is a capacious haematodocha which is expanded when the bulb is activated. The female palp lacks a claw.

The first two pairs of legs are modified and much larger than the posterior two pairs. The

tarsi and metatarsi are not reduced in size as they are in the palpimanids and both legs (rather than just leg I) bear an extensive scopula on the prolateral surface of both the tarsi and metatarsi and a smaller scopula on the distal prolateral surface of the tibiae (fig. 311). The individual scopula hairs are similar to those of the palpimanids, with a long slender stem that is laterally ciliate and a strongly expanded distal plate (fig. 312). These are comparable with the hairs found on the anterior legs of the Archaeidae and the Huttoniidae except that in those two families the stem is smooth. There are two claws which are slightly smaller on the first two pairs of legs. The trichobothria are limited to the tibiae and metatarsi as in the Palpimanidae, but the bothria are more strongly ridged (fig. 318).



FIGS. 308–312. Stenochilidae: *Stenochilus hobsoni* O. P.-Cambridge. 308. Carapace, 309. Eyes from in front. 310. Fovea. 311. Tibia, metatarsus, and tarsus I, showing scopula. 312. Scopula hairs from tibia I.

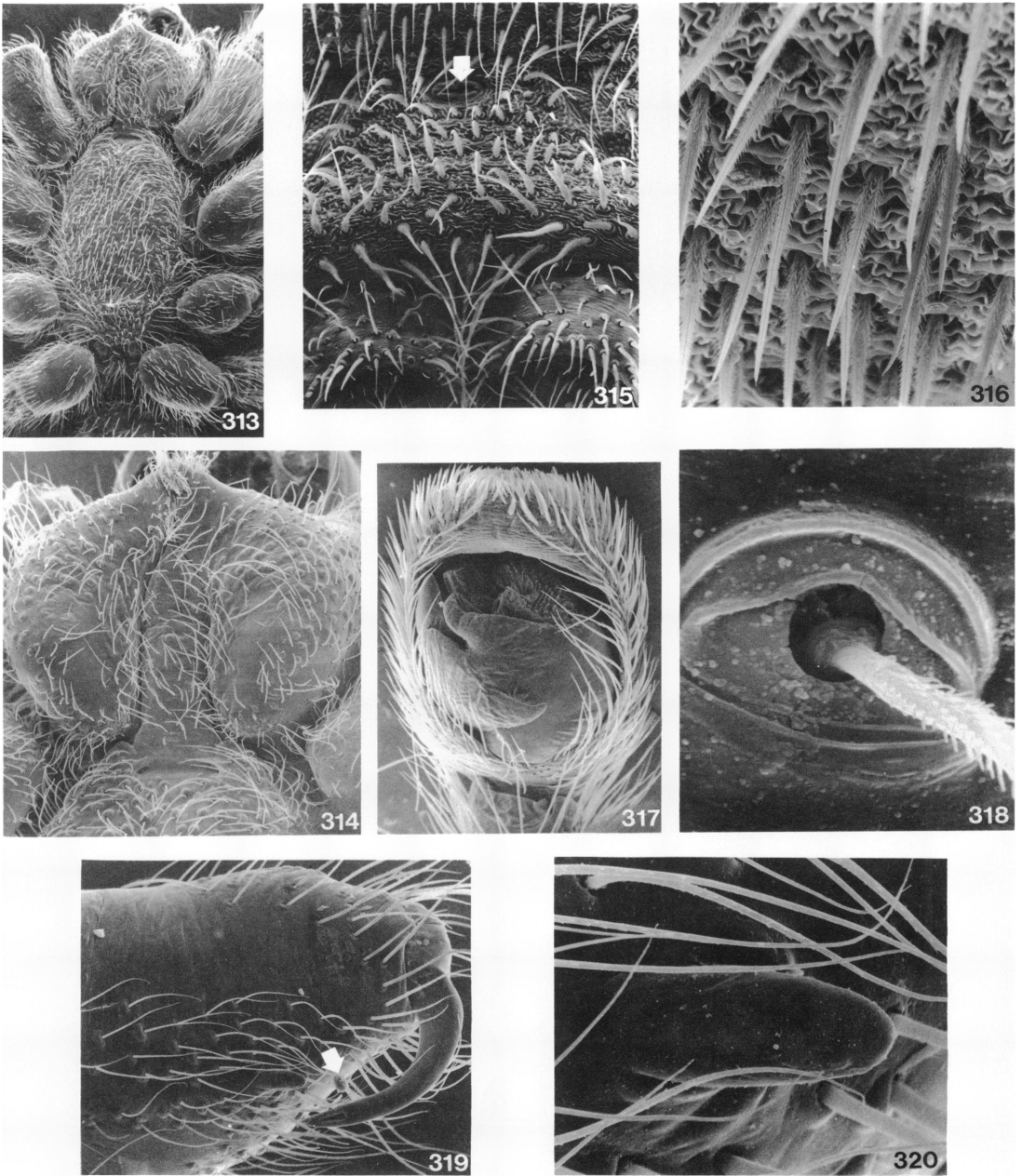
The tarsal organ is exposed, not raised above the surface of the tarsus, and surrounded by a number of low ridges (figs. 326, 327).

Although superficially similar to the palpimanids, the peculiar modifications of the carapace, the entirely different palpal mechanics, and the retention of the exposed form of tarsal organ readily separate the stenochilids from that family.

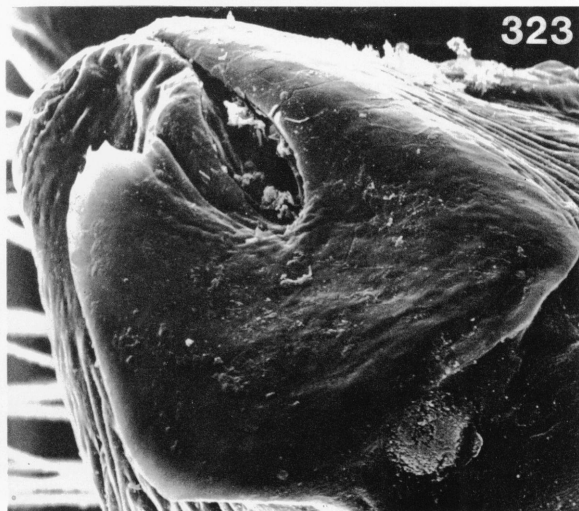
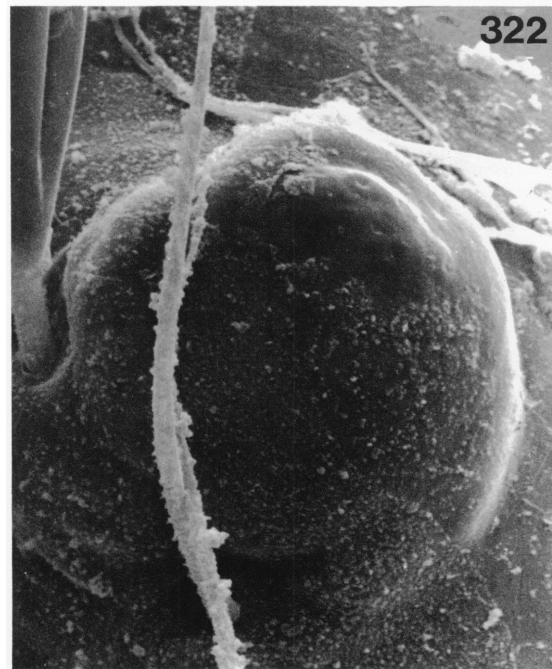
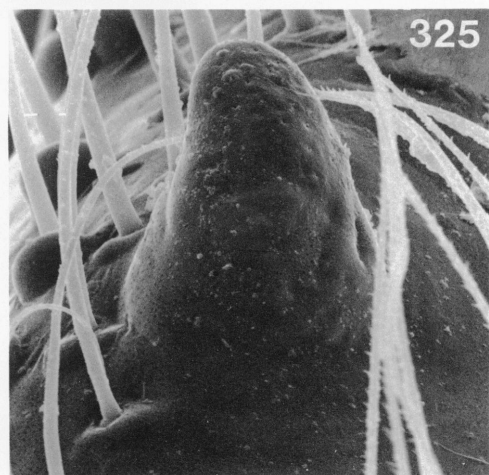
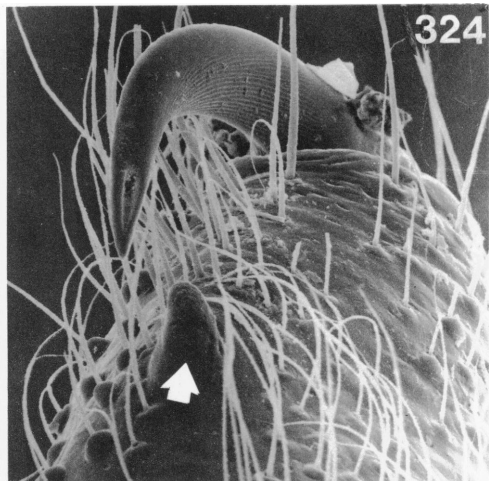
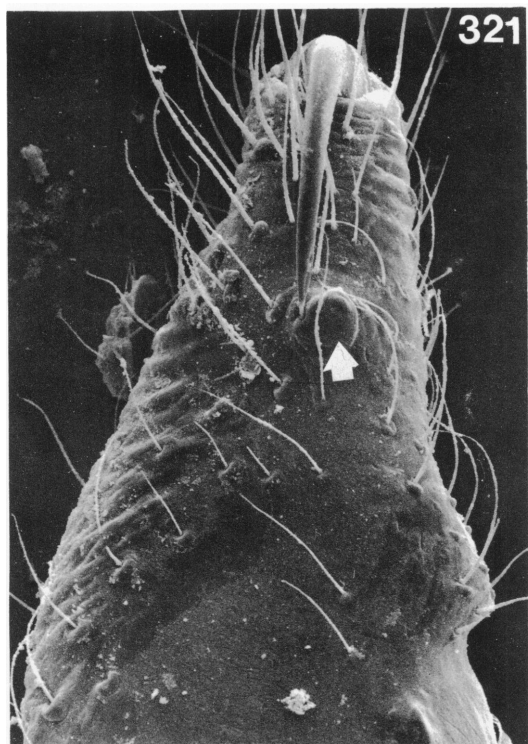
THE HUTTONIIDAE

These small New Zealand spiders have long been known but rarely collected. They have

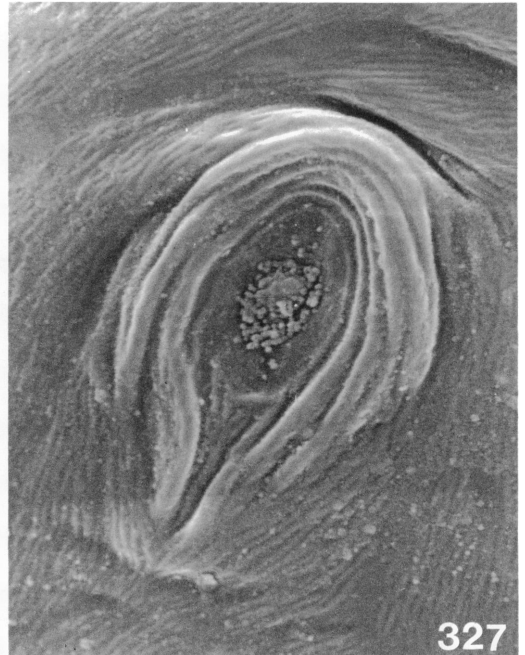
been associated with the palpimanids since Simon (1893) first established a separate subfamily for the single known species, but the lack of material has meant that no direct study of them has been undertaken since the first and only species was described by O. P.-Cambridge (1879). Platnick and Shadab (1974) excluded the group from both the Stenochilidae and the Palpimanidae but left it for further study. Because we agree with those authors that the huttoniids should be given familial rank (and consider that they should be retained in the Palpimanoidea), a



FIGS. 313–320. *Stenochilidae*: *Stenochilus hobsoni* O. P.-Cambridge. 313. Ventral surface of cephalothorax. 314. Labium and endites; note the absence of a groove between the labium and sternum. 315. Distoventral portion of abdomen; arrow indicates the position of the spiracle; anterior spinnerets are at bottom. 316. Abdominal hairs. 317. Male palp. 318. Trichobothrium. 319. Chelicera; note the absence both of peg teeth and true teeth; arrow indicates the position of the gland mound. 320. Cheliceral gland mound.



FIGS. 321-325. Stenochilidae. 321-323. *Colopea pusilla* (Simon). 324, 325. *Colopea* sp. from Papua New Guinea. 321, 324. Chelicera; arrow indicates the gland mound. 322, 325. Cheliceral gland mound. 323. Distal portion of male palpal bulb.



FIGS. 326, 327. Stenochilidae: tarsal organ. 326. *Colopea pusilla* (Simon). 327. *Stenochilus hobsoni* O. P.-Cambridge.

formal treatment of the family is provided here.

HUTTONIIDAE SIMON, NEW RANK
 Figures 277, 278, 299, 304, 328–355

Huttoniinae Simon, 1893, pp. 393, 397 (type genus *Huttonia* O. P.-Cambridge).

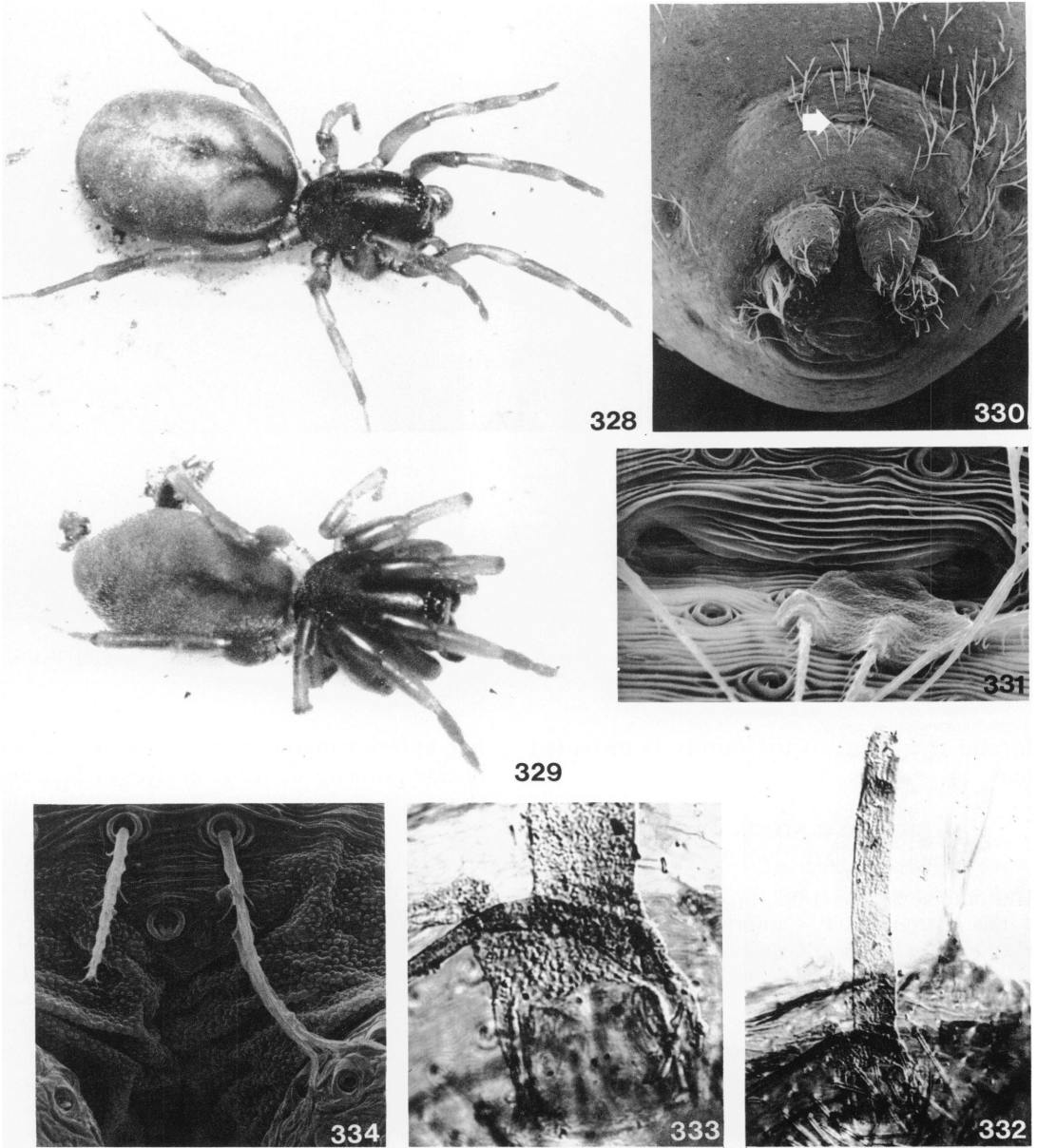
Huttoninae (*lapsus*): Petrunkevitch, 1923, p. 179; 1928, pp. 38, 97.

DIAGNOSIS: Huttoniids resemble palpi-manids, stenochilids, and archaeids in having distally spatulate setae prolaterally on metatarsi I and II. They differ from the first two families in not having a thick scopula of such hairs and in retaining six spinnerets and from the last one in not having an elevated pars cephalica.

DESCRIPTION: Small to medium-sized (body length 4.0–5.5 mm.) ecribellate, haplogyne, araneomorph spiders (figs. 328, 329). Eight eyes in two rows, with anteriors much smaller than posteriors (figs. 335, 336); laterals distinctly separated; medians separated from each other. Carapace evenly rounded so that head region merges into thorax; fovea lack-

ing; anterior margin terminating above chelicerae, shortly in front of eyes. Chelicerae short, stout; fang short; furrow shallow (fig. 336); promargin with peg teeth, additional group of peg teeth opposite fang tip; true teeth absent (fig. 345); cheliceral gland opening from erect lobe set on retromargin immediately behind level of fang tip (figs. 346, 347), pores situated on distal surface of lobe (fig. 348). Poison gland endocephalic. Outer surface of chelicerae apparently without stridulatory ridges. Endites directed across labium, meeting in midline (fig. 338); serrula a single row of teeth; labium triangular in outline, sharply pointed distally. Labrum without lateral protuberances. Sternum scutiform, only slightly longer than wide, pointed posteriorly; coxae IV widely separated (fig. 337).

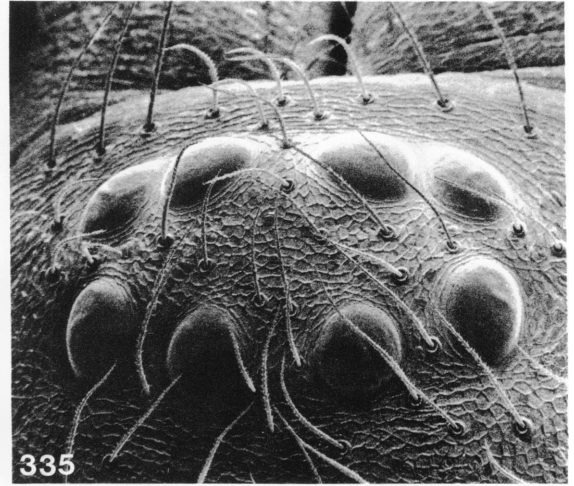
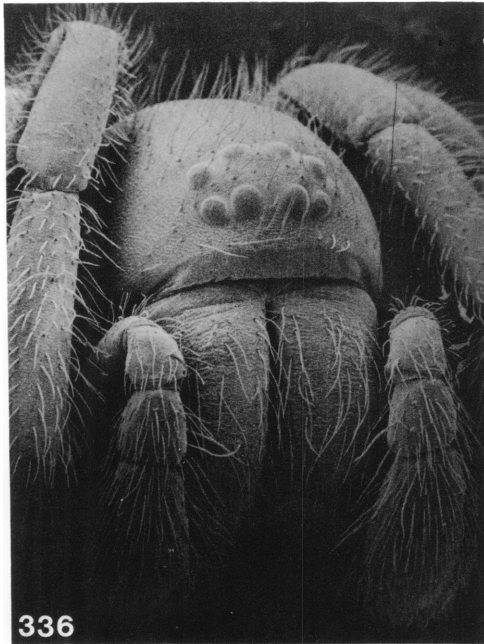
Abdomen ovate, much longer than wide; slight sclerotic thickening present above epigastric region but no scuta; anterior surface without stridulatory file. Abdominal hairs plumose. Six spinnerets (fig. 330), anteriors and posteriors well developed; posteriors widely spaced, with medians arising from



FIGS. 328–334. *Huttoniidae*: *Huttonia palpimanoides* O. P.-Cambridge. 328. Female walking. 329. Female at rest. 330. Distoventral surface of abdomen, showing spinnerets and tracheal spiracle (arrow). 331. Tracheal spiracle; note the paired apertures. 332. Tracheae. 333. Base of trachea, showing the two narrow ducts which lead from the paired spiracles into the atrium; note the large median tracheal trunk formed by the fusion of the apodemal processes. 334. Colulus and base of anterior spinnerets.

common base in line with them; colulus indistinct but with three hairs (fig. 334). Female internal genitalia restricted to anterior face of bursal cavity; membranous median recep-

ta culum flanked on each side by hollow sclerotic plate into which a secretory gland discharges through small poreplate; group of small, spherical receptacula at base of plate



FIGS. 335, 336. Huttoniidae: *Huttonia palpimanoides* O. P.-Cambridge. 335. Eyes from above; the chelicerae are at top. 336. Anterior view of male cephalothorax.

communicate with atrium through slender ducts (fig. 299).

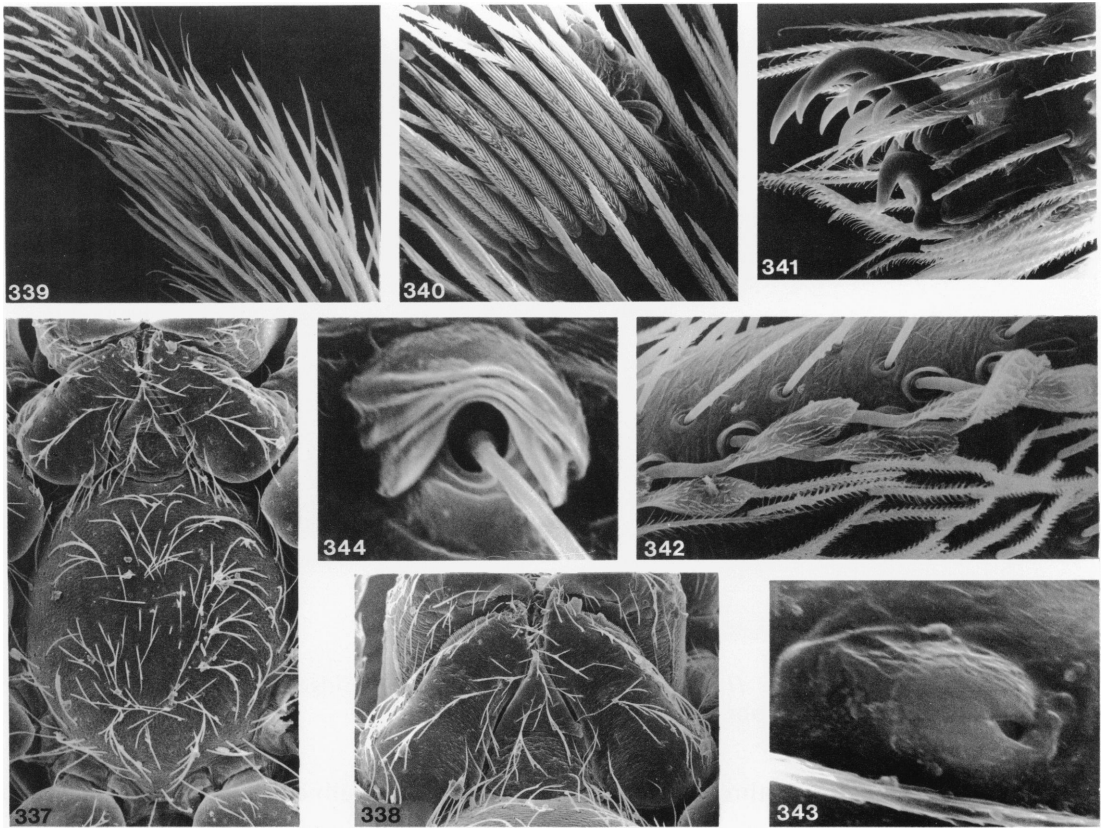
Legs normal, clothed with plumose hairs; few spines present on tibiae and metatarsi III and IV (usually a ventral pair on tibiae and single prolateral spine on metatarsi). Tarsi without ring of unsclerotized cuticle; three claws arising from short lobe which may be a reduced onychium (fig. 341); superior claws with single row of teeth, inferior claw with single tooth, no false claws present. Single subdistal trichobothrium on metatarsi, few on tibiae; bothria transversely ridged (fig. 344). Tarsal organ capsulate, appears to extend back from normal dome in type species (but structure has not been sectioned; fig. 343). Metatarsi and tarsi I and II with row of distally spatulate hairs on prolateral surface (fig. 342). Metatarsus III with distoventral preening comb in both sexes (figs. 339, 340); this structure could also function as stridulatory pick but no file is apparent. Female palp with small distal claw. Proximal segments of male palp without processes; cymbium large, spoon-shaped, with deep ventral alveolus in which bulb is fully retracted (figs. 277, 349,

354); at rest, bulb obscured by thick layer of hairs extending over margin of alveolus (fig. 353); in most species examined, embolus relatively short, spinous, associated with variously shaped flaps acting as conductor (figs. 350–352), but at least one species has strong distal embolus only and no accessory processes (figs. 277, 278, 355); in that species bulb also retracted within cymbium when at rest, with embolus resting in groove on distoventral surface of cymbium; in all species, very large haematodocha present which when distended twists bulb and projects it down at right angles to cymbium.

Number of heart ostia unknown. Respiratory system consisting of anterior pair of booklungs and posterior tracheae; median slit, clearly separated from spinnerets (figs. 330, 331), with two small spiracles leading into three tracheal tubes (figs. 332, 333); median tube, representing fused median apodemes, large but short; outer pair much more slender, extending forward to epigastric furrow (fig. 304).

INCLUDED GENERA: Only the type genus.

DISTRIBUTION: New Zealand.



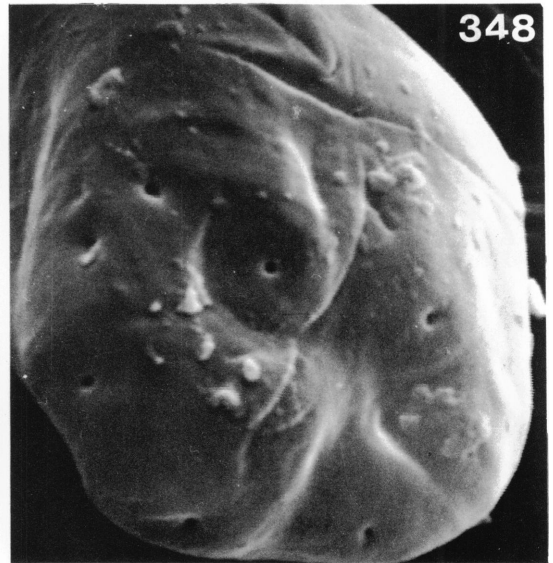
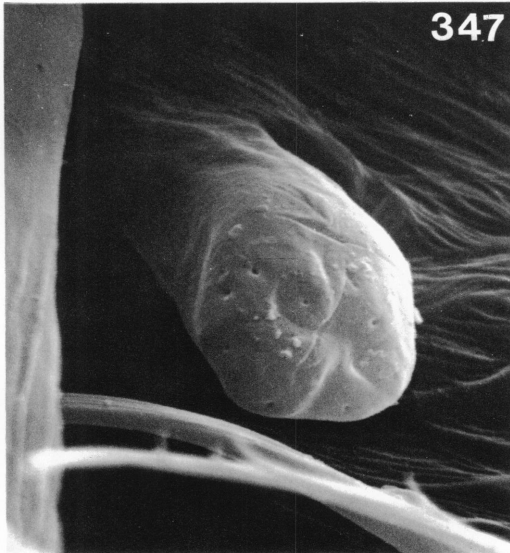
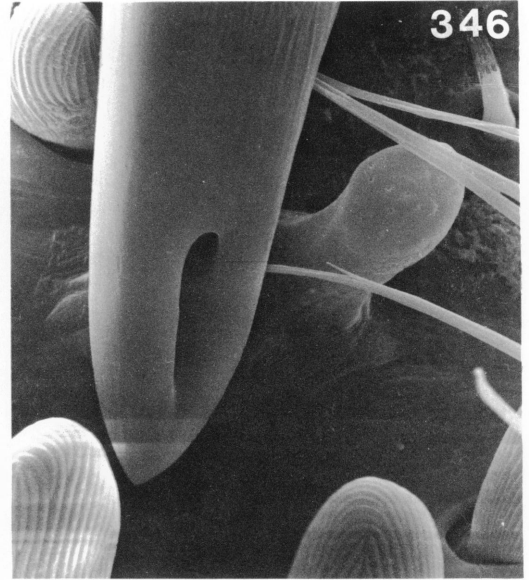
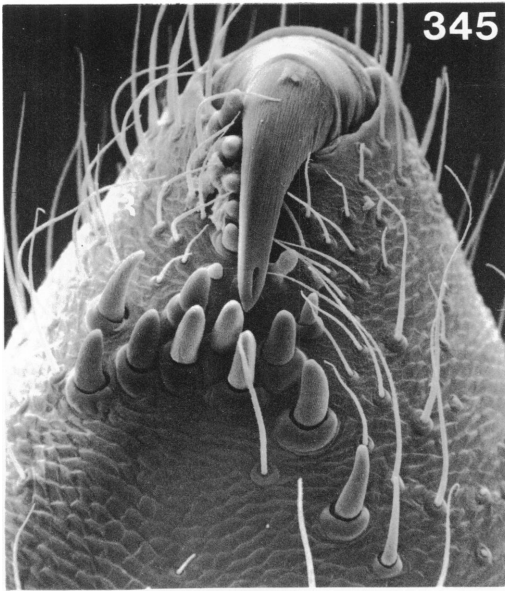
FIGS. 337–344. Huttoniidae: *Huttonia palpimanoides* O. P.-Cambridge. 337. Sternum, labium, and endites. 338. Labium and endites. 339. Distoventral portion of metatarsus III, showing the comb. 340. Metatarsal comb. 341. Claws of leg III. 342. Scopula hairs on metatarsus I. 343. Tarsal organ. 344. Trichobothrium.

DISCUSSION: The taxonomic history of these little-known spiders has been limited by the rarity of specimens in collections. All published commentary has been based on the single female specimen examined by O. P.-Cambridge, who established the genus for a single female specimen sent to him by Captain Hutton from Dunedin, New Zealand (O. P.-Cambridge, 1879). The general resemblance of the species to the palpimanids was reflected in his choice of specific name (*H. palpimanoides*), but Cambridge nevertheless decided that it must be related to *Ceto* (presently in the Clubionidae) and so placed it in his family Enyoidae. Simon (1893), however, established a separate subfamily for the genus, placing it next to his Stenochilinae in the Palpimanidae. Petrunkevitch (1923, 1928)

decided that the subfamily should be transferred to the Zodariidae and since then his placement has usually been followed.

Actually, Cambridge stated quite clearly that the spider he described did not have an epigynum, but the fact that the genitalia are haplogyne does not seem to have been recognized by any of the subsequent authors. If the male had been described, the presence of a well-developed haematodocha would have reinforced the belief that the spider was entelegyne as until recently it was generally thought that the haematodocha was a strongly derived character of the male palp which was only associated with entelegyne female genitalia.

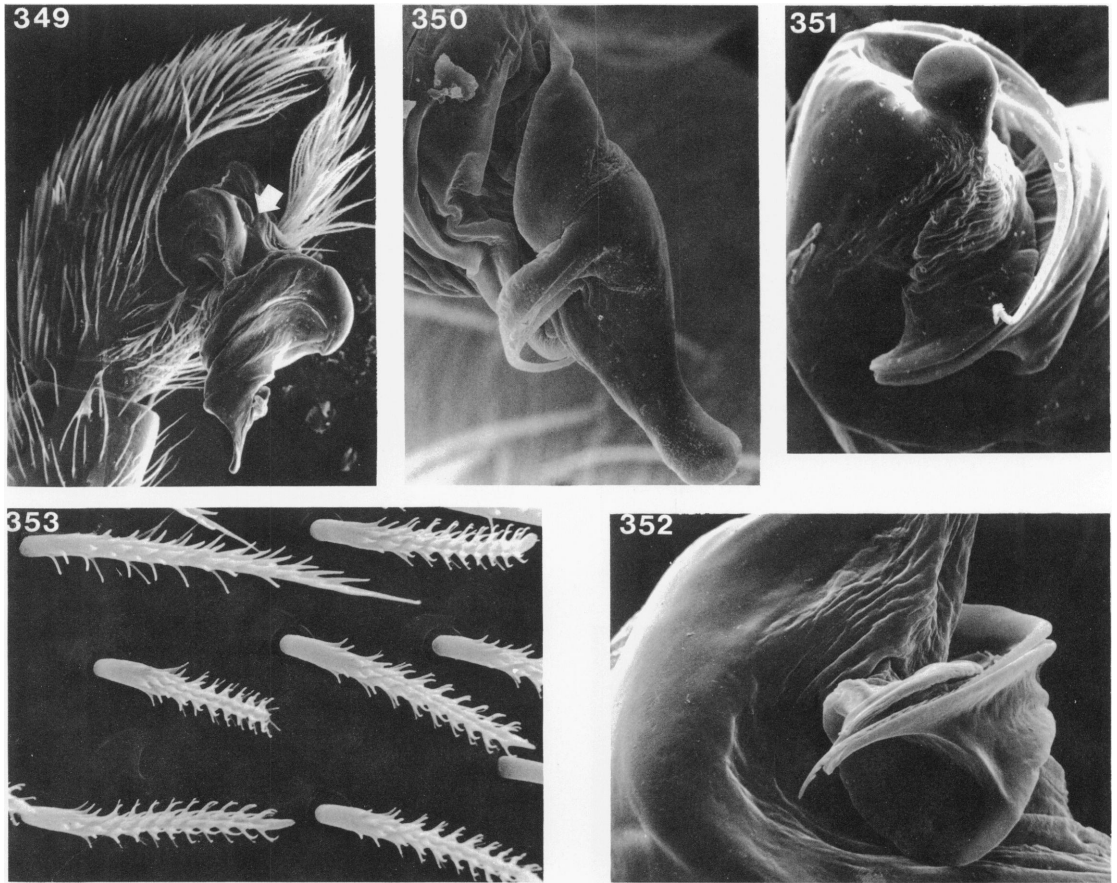
NATURAL HISTORY: These spiders are known only from New Zealand and until re-



FIGS. 345–348. Huttoniidae: *Huttonia palpimanoides* O. P.-Cambridge. 345. Medial view of chelicera, showing the short fang and peg teeth. 346. Tip of fang showing position of the cheliceral gland mound. 347. Cheliceral gland mound. 348. Distal portion of cheliceral gland mound, showing distribution of the pores.

cently were poorly represented in collections. They were generally collected singly from litter and were only rarely found until it was realized that they occupy a restricted niche—the dead fronds of low-growing ferns in rain-

forest. Subsequently, large series have been collected from many parts of New Zealand; these have demonstrated the presence of a number of species and probably a second genus. A similar search has not been carried



FIGS. 349–353. Huttoniidae: *Huttonia palpimanoides* O. P.-Cambridge, male palp. 349. Oblique view; note the deep alveolus in which the bulb normally rests and the well-developed haematodocha (arrow). 350–352. Distal portion of bulb. 353. Hairs on cymbium.

out in Australia and so the apparent absence of the family from that continent is not necessarily informative.

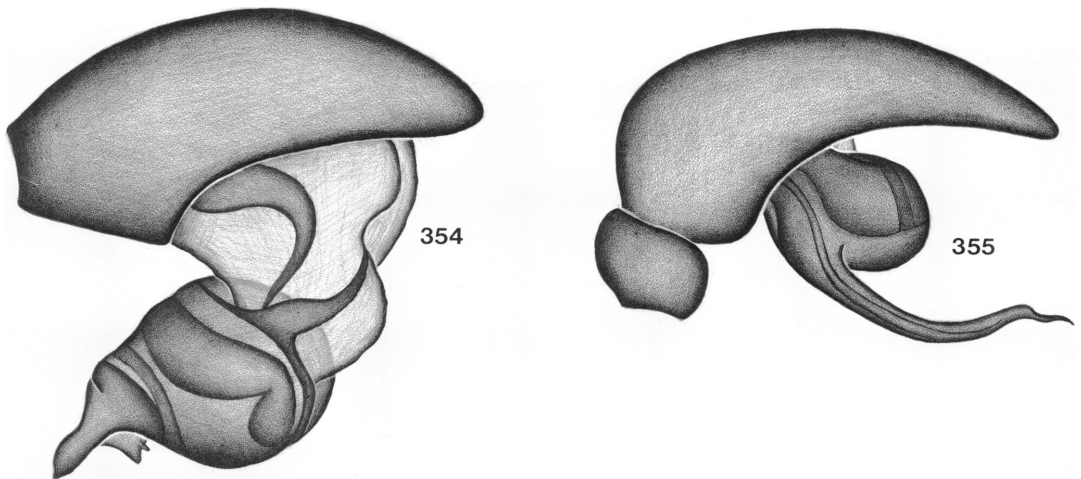
The spiders construct a purse retreat among the fronds and range out from these to hunt their prey. In captivity the spiders will feed on a wide range of insects and also on the terrestrial amphipods which are abundant in the moist decaying fronds. Although most of the species are similar to the type species there is also one or more species where the embolus is extended forward and the accessory processes are not present, resulting in a configuration very similar to that found in some of the palpimanids. As in that family the embolus then rests on the ventral surface of the

tip of the cymbium, which is excavated to form a secondary conductor.

THE TEXTRICELLIDAE AND MICROPHOLCOMMATIDAE

Figures 356–376

These two families are separated primarily by tracheal features. Both are apneumone but, whereas the textricellids have lost the posterior tracheal system and transformed the lamellae of the anterior pair of booklungs into simple tracheal tubes that are limited to the opisthosoma, the micropholcommatids have retained the posterior tracheae and the anterior tracheae have penetrated through into

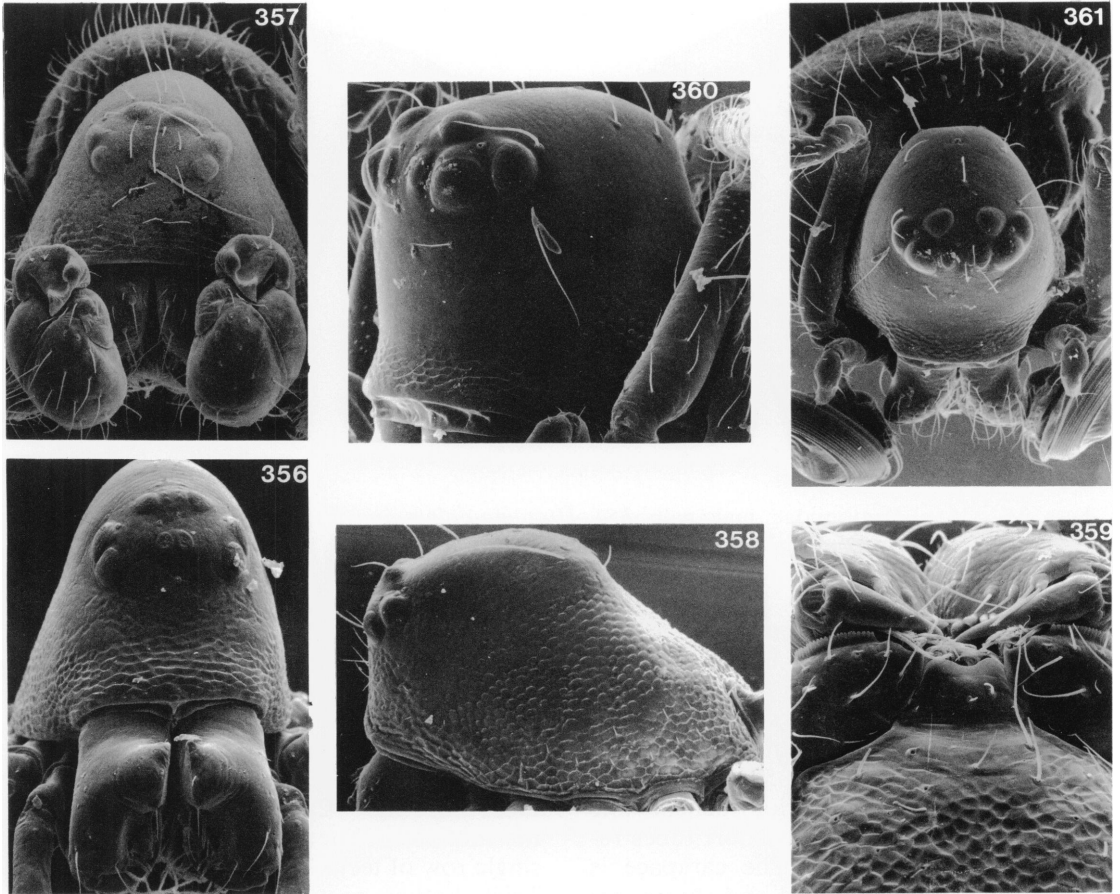


FIGS. 354, 355. Huttoniidae: male palp. 354. *Huttonia palpimanoides* O. P.-Cambridge. 355. Undescribed species from South Island of New Zealand.

the prosoma. The two taxa are conveniently retained as separate families but could equally well be considered as two subfamilies in a single family taxon.

The trixicellids are minute (body length usually between 1.0 and 1.5 mm.) apneumone spiders without posterior tracheae. The anterior tracheae have a few short tubes restricted to the abdomen. The carapace is strongly raised but the head and thorax are not strongly separated and do not form a neck (figs. 356–358). The fovea is indistinct or absent. The anterior margin of the carapace terminates above the chelicerae. There are six or eight eyes with the laterals contiguous and usually well separated from the medians, which are themselves separated; when six eyes are present the AME are lost. The AME, when present, are usually the smallest. The sternum is scutiform, as wide as long, and obtusely pointed posteriorly where coxae IV are clearly separated. The labium is usually subrectangular, distally notched, and as wide or wider than long (fig. 359). The endites are directed across the labium but do not meet in the midline; the serrula is a single row of teeth. The abdomen is ovoid, with a coriaceous cuticle and scutes often present over the epigastric region (and, in males, on the dorsal surface; figs. 362, 363). There are six spinnerets and a strongly developed labiate

colulus (fig. 365). The chelicerae are vertical and have teeth on both margins; peg teeth are usually present on the promargin at least in males (fig. 371). The cheliceral gland opens from a small mound with only a few pores. The legs lack spines but are clothed with plumose hairs (fig. 372). The tarsi are longer than the metatarsi. The three claws each have a single row of teeth. No onychium is present. Trichobothria occur on the tibiae and metatarsi; the bothria have a weakly developed posterior hood (fig. 374). The tarsal organ is capsulate, with a smooth dome (fig. 373); sensory lobes are usually situated directly below the opening. The patella of the male palp is often strongly modified and furnished with processes (fig. 362); the tibia is reduced in size, usually present as a flattened plate abutting on the cymbium; the cymbium lacks processes. The bulb is provided with a haematodocha. The embolus may be short and tubular (figs. 366, 367) or more strongly developed and sometimes coiled (fig. 368). Although the strongly coiled forms may appear complex only two processes are involved—the embolus and a second lobe or plate which acts as a conductor in much the same way as in the Pararchaeidae. The epigynum is weakly developed in most species (fig. 363) but more conspicuous in others (where the patellar processes are complex). The internal

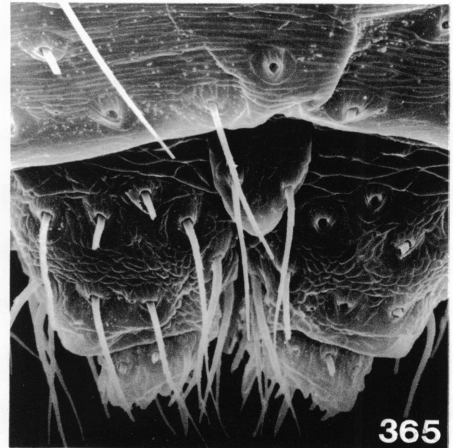
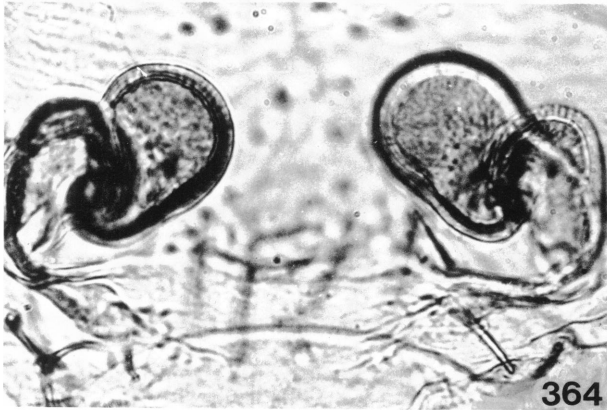
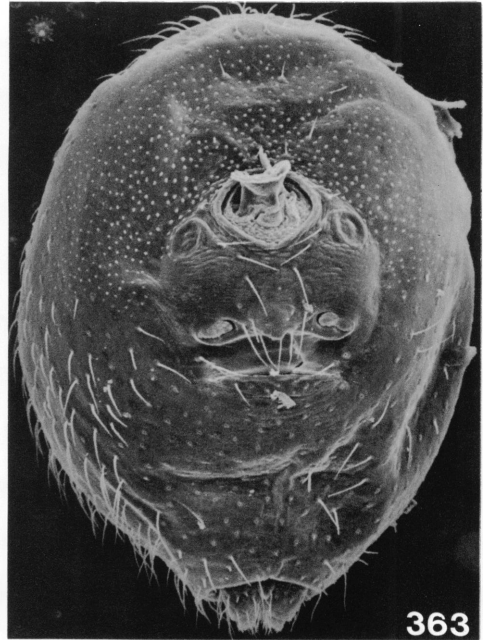
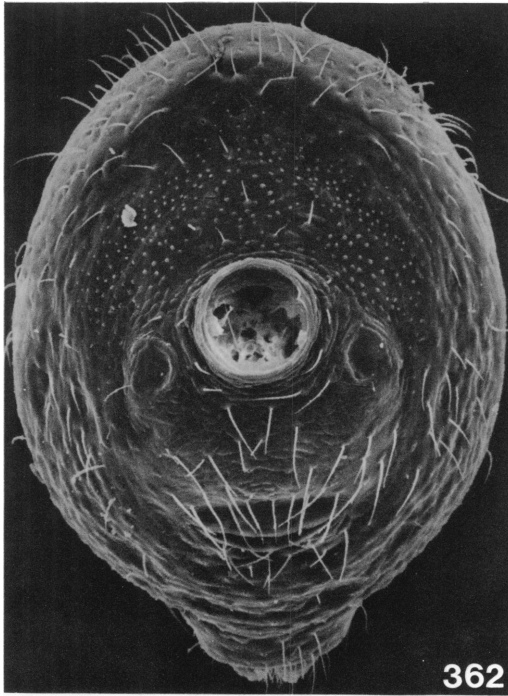


FIGS. 356–361. Tetriceillidae and Micropholcommatidae. 356. *Trixicella luteola* Hickman. 357–359. *T. vulgaris* Forster. 360, 361. *Micropholcomma longissima* (Butler). 356, 357, 361. Anterior view of head. 358, 360. Lateral view of carapace. 359. Labium and endites.

genitalia generally have two receptacula (fig. 364) and a distinct fertilization duct, but *Trixicella*, which has two pairs of receptacula, may be haplogyne. The female palp is small, and lacks a claw.

The micropholcommatids show a similar range in most characters (figs. 360, 361, 370, 375, 376). The bulb of the male palp shows the same range of developments as in the tetriceillids. There are some species with a short distal embolus associated with an adjacent lobe whereas others, such as *M. longissima* (Butler), have an extremely long and tightly coiled embolus (fig. 369). Segmental processes, when present, appear on the patella but the tibia, though small, is not so

strongly modified. The female palp is small and lacks a claw and there is a tendency for the segments to fuse together. The main characters which separate the two taxa are respiratory. In the micropholcommatids both the second and third abdominal segments have tracheae. The posterior tracheal system is a weakly developed quadritracheate arrangement which opens through a median spiracle situated at the base of the spinnerets. The anterior tracheae invariably lead out from a large atrium and the tracheae are more strongly differentiated than they are in the tetriceillids. In all the species examined one of these tracheal tubes curves in to the center line and passes through the petiole into the

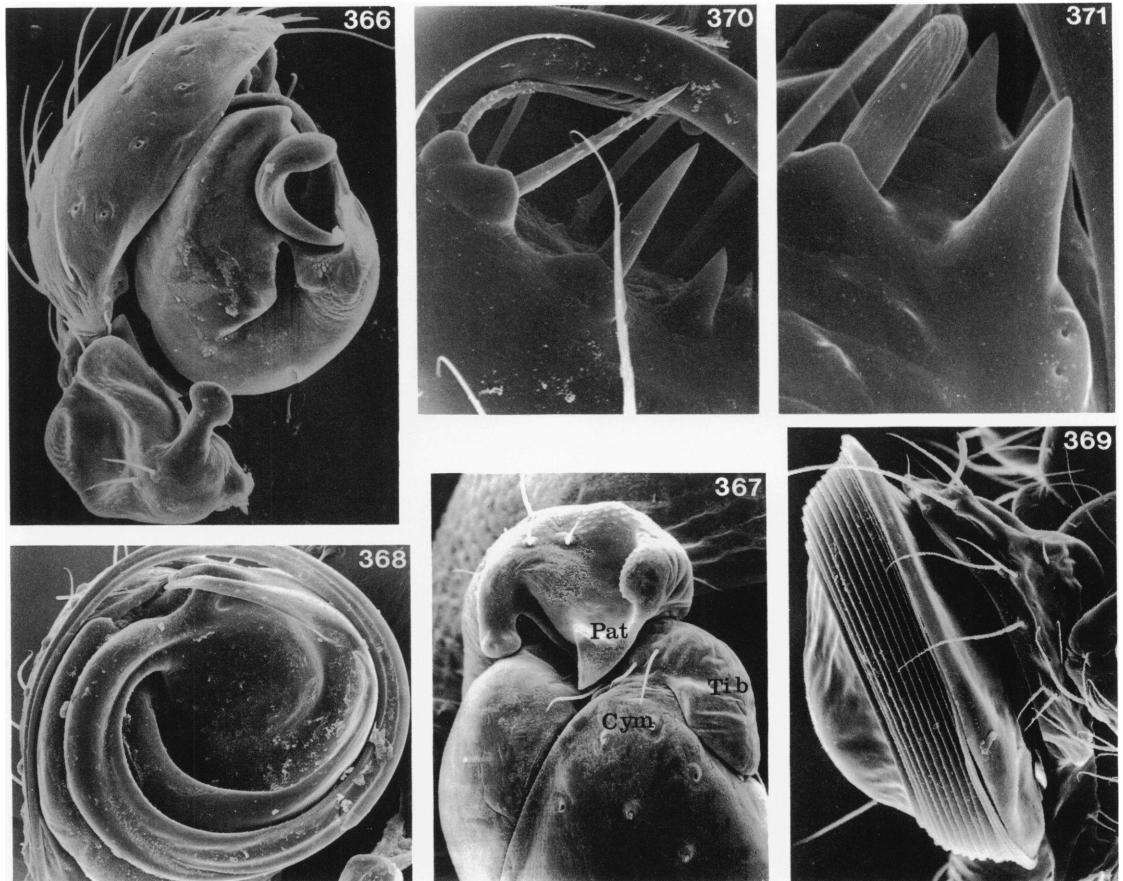


FIGS. 362–365. *Textricellidae*: *Textricella vulgaris* Forster. 362. Ventral view of male abdomen. 363. Ventral view of female abdomen. 364. Internal female genitalia. 365. Spinnerets and colulus.

prosoma. As in the tetricellids, despite the differences in other somatic characters, the form of the tracheal system remains constant.

The placement of the *Textricellidae* and *Micropholcommatidae* in the *Palpimanoidea* rests on a number of characters which are, however, generally derived in relation to the probably plesiomorphic states for the superfamily. There is a reduction in the number

of peg teeth on the cheliceral promargin, especially in females, and indeed these are often absent. True teeth may be present on both margins and the cheliceral gland mound is reduced in size and, judging from the paucity of pores, the actual gland is small. The hairs on the legs retain, in at least some species, the plumose form which is considered plesiomorphic, whereas in other species the hairs



FIGS. 366–371. Textricellidae and Micropholcommatidae. 366, 367, 371. *Textricella vulgaris* Forster, male, showing patella (Pat), tibia (Tib), and cymbium (Cym). 368. *T. luteola* Hickman. 369, 370. *Micropholcomma longissima* (Butler), male. 366–369. Palp. 370. Chelicera, showing peg tooth. 371. Chelicera; note small gland mound at base of true tooth.

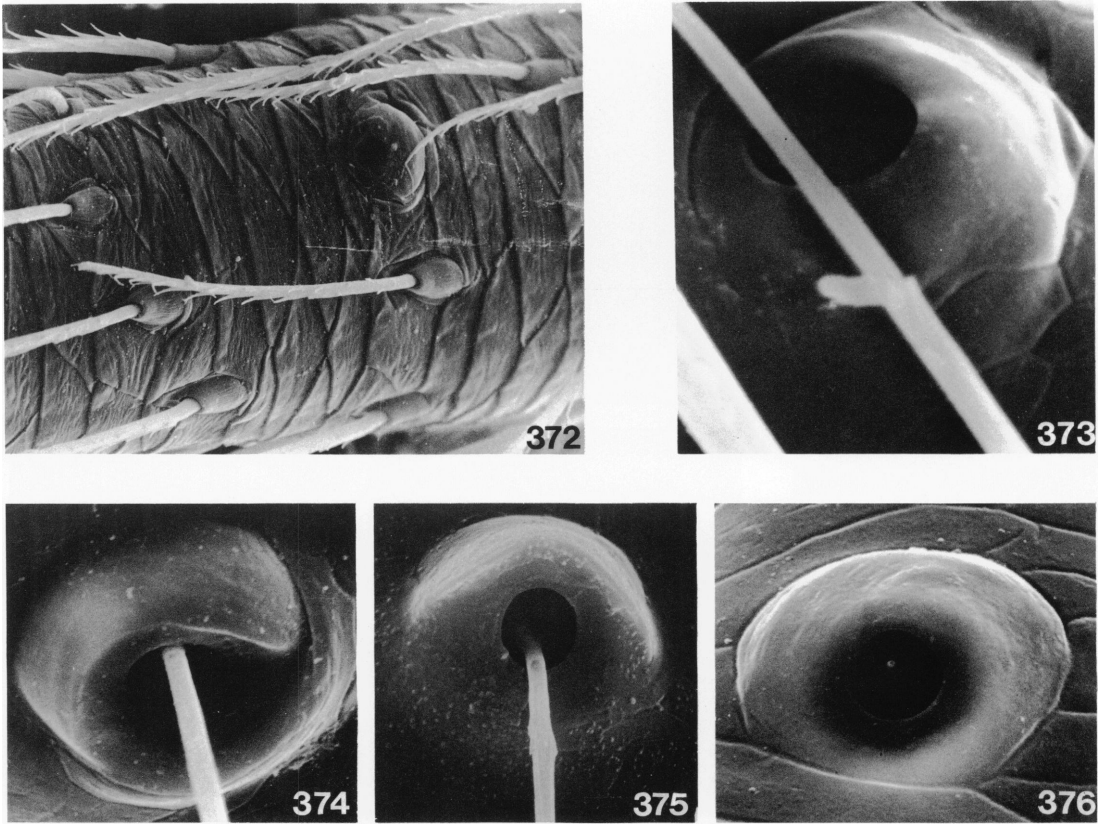
are serrate. No spatulate hairs are present on the anterior legs and spines are completely lacking. The endites are directed across the labium but are reduced in length and do not meet in the midline. The male palp is similar to the pararchaeid organ, particularly in the organization of the bulb, but the cymbium does not possess a paracymbial lobe. The elevation of the head is manifested as in the four archaeid families, but the encirclement of the chelicerae has not taken place and so the chelicerae are relatively short and in close approximation with the mouthparts. The bothria and tarsal organ are both strongly derived but the large opening of the tarsal organ may in itself be a primitive state in the evolution of the capsulate form of this organ.

The possibility that *Tricella* may have haplogyne female genitalia is not surprising as this could well be the plesiomorphic condition for all of the families placed in this superfamily.

THE MIMETIDAE

Figures 306, 377–393

Simon (1895) placed the Mimetidae next to the Archaeidae, apparently basing this association on the similarity of the cheliceral dentition in the two families as well as on the form of the endites. In his discussion of the structural details, however, he based most of his comparisons on various groups within his Theridiides. In particular he pointed out



FIGS. 372–376. *Textricellidae* and *Micropholcommatidae*. 372–374. *Textricella vulgaris* Forster. 375, 376. *Micropholcomma longissima* (Butler). 372. Portion of tarsus, showing tarsal organ and ciliate hairs. 373, 376. Tarsal organ. 374, 375. Trichobothrium.

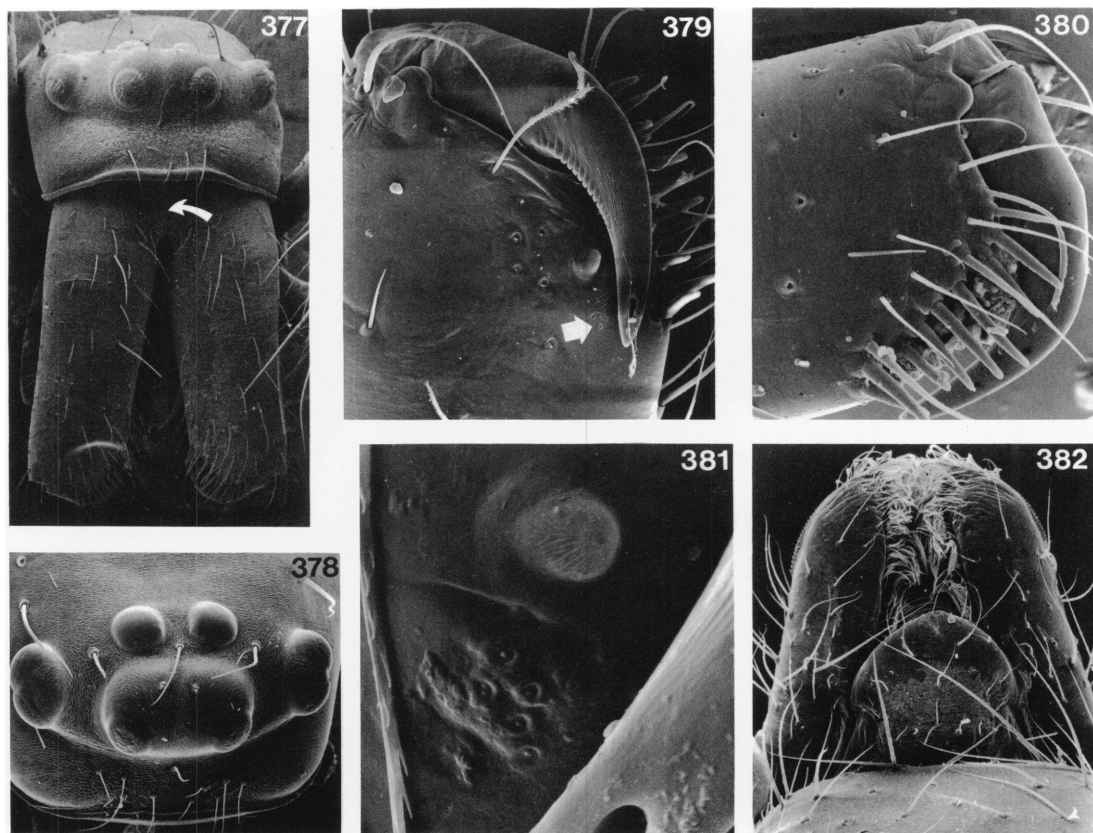
analogies to the male palp of *Meta* and *Nesticus*, including the presence of a well developed paracymbium and, as in *Meta* in particular, the elongation of the palpal segments.

The relationships suggested by Simon have been generally accepted and in particular it is usually assumed that the *Mimetidae* are closely related to or are part of the *Araneoidea*. We accept the (distant) relationship with the *Arachaeidae* but consider that the *Mimetidae* should be placed in the *Palpimanioidea* rather than the *Araneoidea*.

The unique character which sets the *Mimetidae* aside from all other families is the peculiar spination on the tibiae and metatarsi of the first two pairs of legs. In addition the ethological characteristic of obligative araneophagy, shared so far as is known only with the *Arachaeidae*, is another prime character-

istic. It is probable, however, that the leg spination in the *Mimetidae* is linked directly with the predatory behavior of these spiders, in contrast to the *Arachaeidae* where this relationship between structure and behavior is more likely expressed by the elongation of the chelicerae and the concomitant elevation of the head.

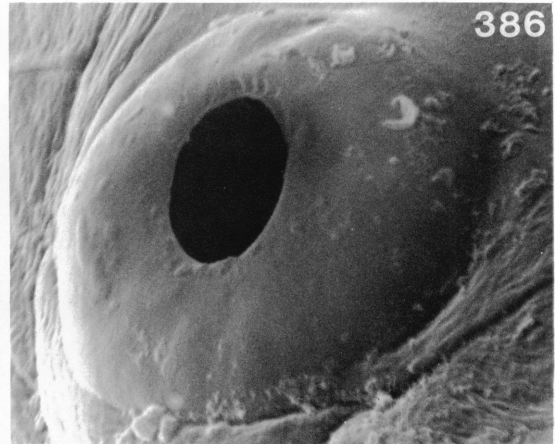
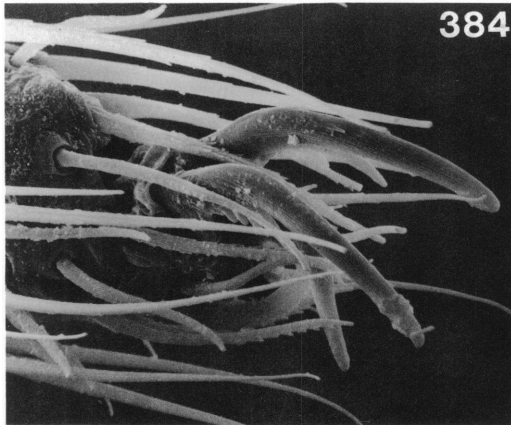
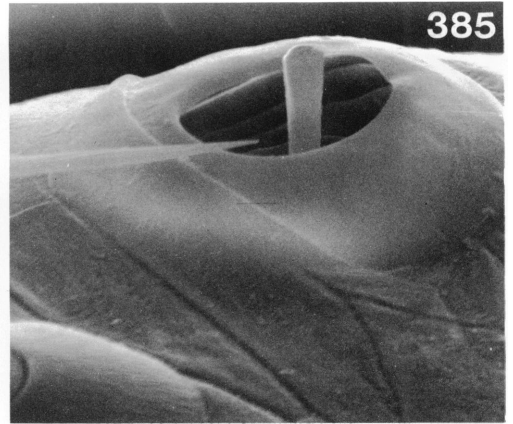
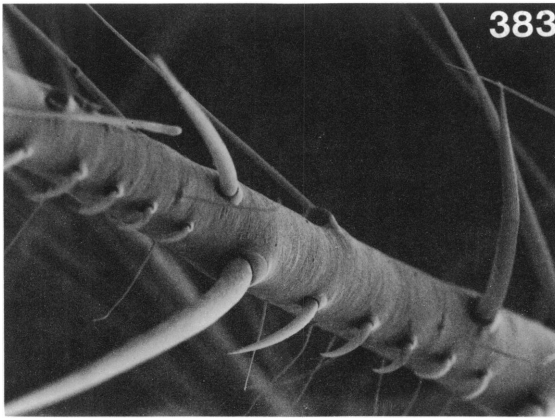
The *mimetids* are entelegyne, ecribellate spiders of medium size. The carapace is oval in outline with the head region not strongly differentiated, but with the eyes well removed from the anterior margin (fig. 377). The fovea is only weakly developed. There are eight subequal eyes with the laterals contiguous and well separated from the medians (fig. 378), which are separated from each other. The lateral eyes and the AME are usually placed on distinct mounds. The chelicerae are rel-



FIGS. 377–382. *Mimetidae: Mimetus mendicus* O. P.-Cambridge. 377. Anterior view of head and chelicerae; note fusion of chelicerae at their base (arrow). 378. Eyes from above; note tubercles on which the anterior medians and the lateral eyes are placed. 379. Chelicera, oblique ventral view; arrow indicates position of the gland mound. 380. Chelicera, anterior view, showing peg teeth. 381. Cheliceral gland mound below retrolateral tooth. 382. Labium and endites.

atively long, directed vertically down from the anterior margin of the carapace, and are usually fused at the base (fig. 377). The fang is short, with peg teeth along the promargin of the furrow and rarely more than a single true tooth on the retromargin (figs. 379, 380). The cheliceral gland opens from a low mound on the retromargin near the tip of the fang and is usually associated with a true tooth in much the same way as in the *Palpimanidae* (fig. 381). The poison gland is endocephalic. The endites are relatively long and are directed across the labium but do not meet in the midline (fig. 382). The labium is longer than wide and triangular or subtriangular in outline. The sternum is scutiform and widely pointed behind; coxae IV are clearly sepa-

rated (fig. 392). The abdomen may be ovate or obtusely squat but the cuticle is never coriaceous and lacks sclerotized plates. There are six spinnerets with a distinct labiate colulus (fig. 393). A single spiracle occurs near the base of the spinnerets; the four slender tracheal tubes are limited to the abdomen (fig. 306). The legs are slender, strongly spined, and clothed with slender serrate hairs; the tibiae and metatarsi of the first two pairs have a distinctive single row of strong spines in which very long spines alternate with a series of smaller spines (fig. 383). Trichobothria are present on the tibiae and metatarsi; the bothria are evenly rounded and lack a posterior hood (fig. 385). The tarsal organ is capsulate and has a smooth dome (fig. 386). There are



FIGS. 383–386. Mimetidae. 383, 385, 386. *Mimetus mendicus* O. P.-Cambridge. 384. *Ero furcata* (Villers). 383. Portion of tibia I showing typical familial spine arrangement. 384. Claws of leg I; note the false claw below the true claws. 385. Bothrium. 386. Tarsal organ.

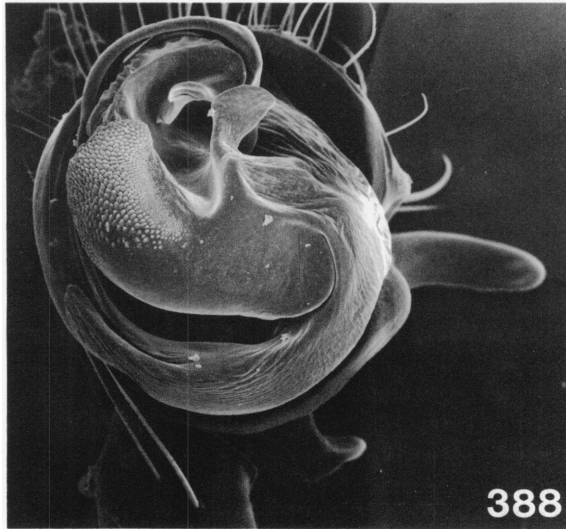
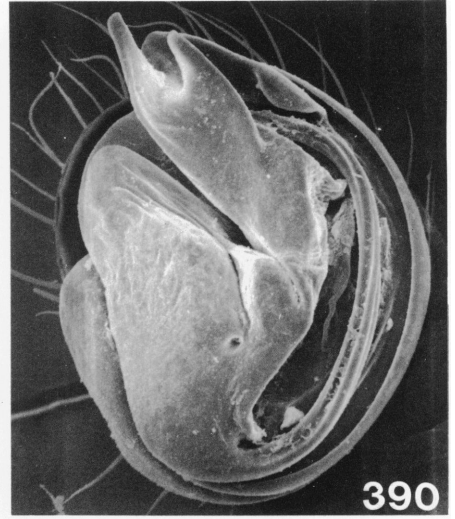
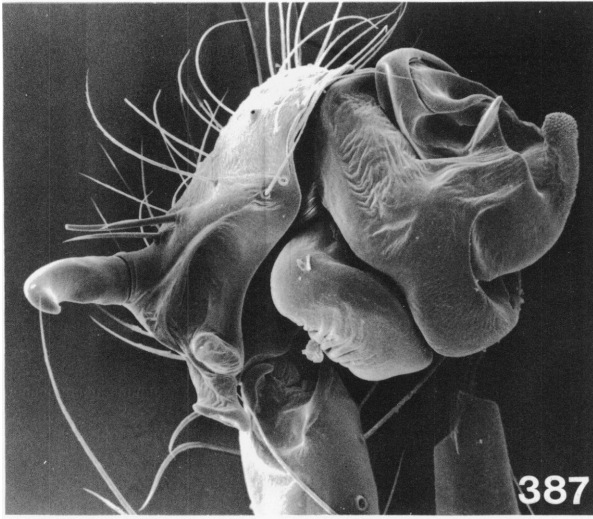
three claws without an onychium, and usually a few false claws below the claws (fig. 384). No scopula hairs or claw tufts are present. The male palp has a strongly developed paracymbial process but is otherwise without processes (figs. 387, 388). The bulb is a typical entelegyne organ with a strongly curved embolus originating from the posterior mar-

gin and extending to the distal margin. In addition to the embolus there is a single large plate which may be variously modified (figs. 387–390). The female palp has a claw. The epigynum is distinct and heavily sclerotized but relatively simple. The internal genitalia consist of two thick-walled receptacula (fig. 391).

CLADISTIC ANALYSIS AND CONCLUSIONS

Our views of the interrelationships of the taxa discussed above are summarized in a cladogram (fig. 394) with 17 numbered components. The most radical of our hypotheses is number 17, which allies the four archaeid

families and the Textricellidae, Micropholcommatidae, and Mimetidae with the classical palpimanoids rather than the Araneoidae. We base this new grouping on two cheliceral features, the presence of promar-

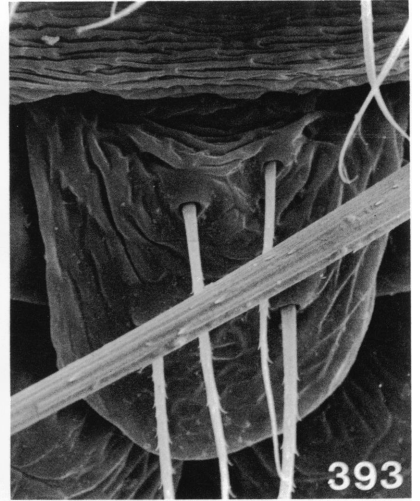
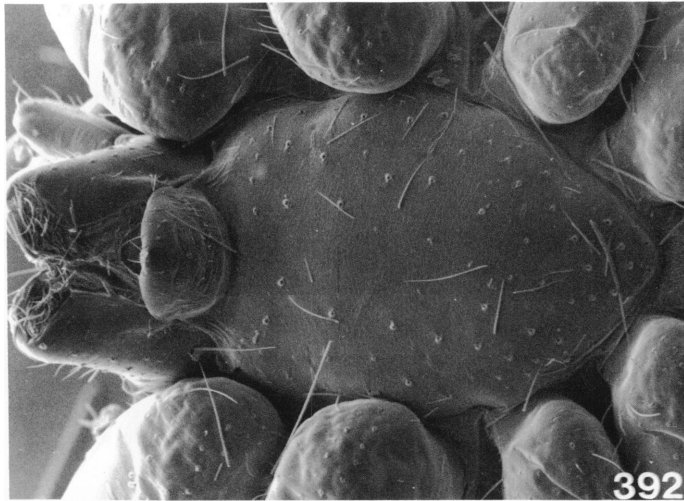


FIGS. 387–390. Mimetidae: male palp. 387, 388. *Mimetus mendicus* O. P.-Cambridge. 389. *Mimetus* sp. from New Zealand. 390. *Ero furcata* (Villers). 387. Retrolateral view. 388–390. Ventral view.

ginal peg teeth and an elevated cheliceral gland mound.

The peg teeth are modified setae and are therefore not homologous to the true cheliceral teeth found in most spiders. To our knowledge, structures resembling peg teeth occur elsewhere only in crab spiders like *Stiphropus* (Ono, 1980, fig. 19) and *Heterogriffus* (Platnick, 1976, fig. 1), and in the scytodoid genus *Periegops*. In those crab spiders, the peg teeth are short, stubby, and closely

clustered, and may prove to be distinguishable from the palpimanoid modifications on morphology alone. In any event, the genitalia and other characters of those genera provide ample evidence for associating them with crab spiders rather than palpimanoids. Similarly, the “peg teeth” of *Periegops* are peculiar in structure, with an expanded base that overlaps the socket, and other features of the spiders (such as the cheliceral lamella) support their retention in the Scytodoidea. It should



FIGS. 391–393. Mimetidae: *Mimetus mendicus* O. P.-Cambridge. 391. Internal female genitalia. 392. Ventral surface of cephalothorax. 393. Colulus.

also be noted that other characters require us to assume that the peg teeth have been independently lost in the Holarchaeidae and Stenochilidae, as well as in some (mostly female) textricellids, micropholcommatids, and mimetids, although the presence of peg teeth is clearly plesiomorphic for those three families.

The elevated cheliceral gland mound appears to be unique to the palpimanoids; in other spiders, the gland seems always to be present but its pores open directly on the cheliceral surface (often near one of the retro-

marginal teeth). The only exceptions known to us occur in the liphistiids (and possibly some mygalomorphs), where a partially raised structure occurs but does not take on the raised and rounded form characteristic of the palpimanoids.

Given the untraditional grouping that this cheliceral morphology supports, we must ask what other characters exist that could contradict the cheliceral features and support the traditional placement of some of these taxa in the Araneoidea. That superfamily has conventionally been regarded as a well-defined

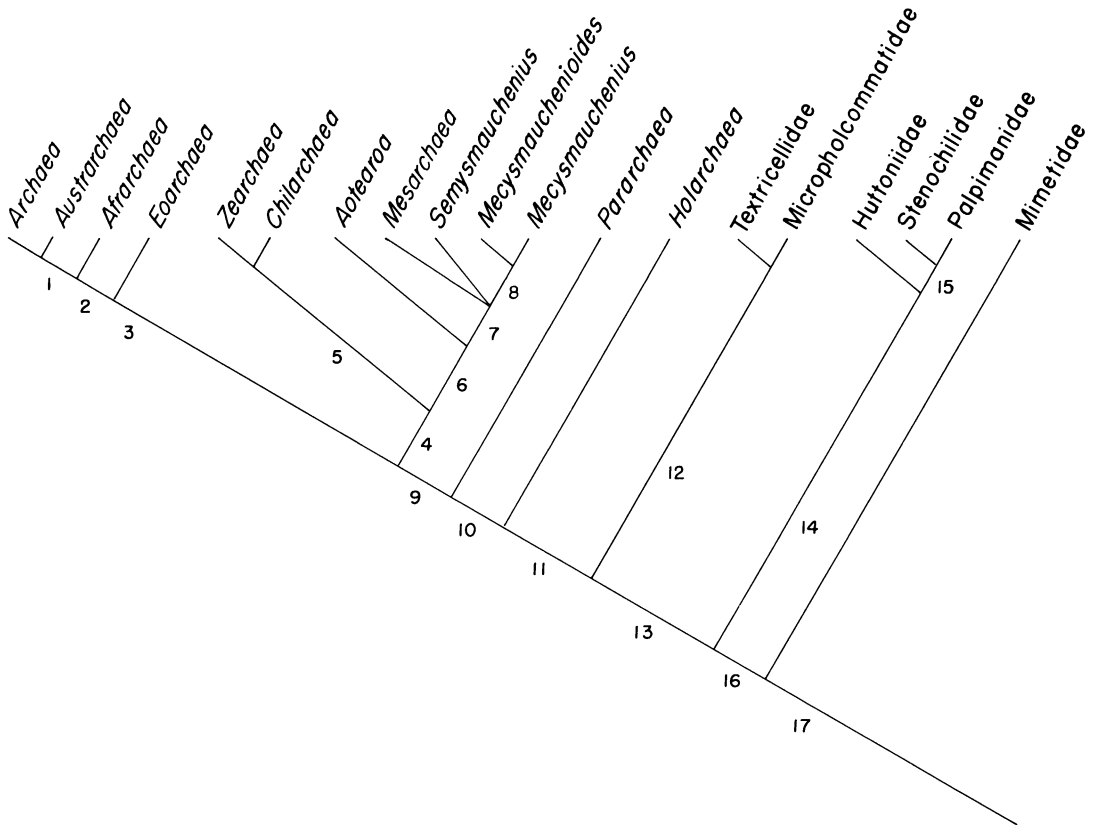


FIG. 394. Cladogram of the Palpimanoidea; see text for characters supporting the numbered components.

assemblage; Lehtinen (1975), for example, considers the superfamily "most distinct" and easily delimited. Unfortunately, however, none of the characters he cites (serrate hairs, trichobothrial pattern, scaled cuticle, a "well developed tarsal organ, and even a fundamentally similar basic colour pattern") are unique to the group. Similarly, Heimer and Nentwig (1982) use three features they claim "make it possible to distinguish them [all araneoids] from other spiders without problems": hanging from a web with the ventral side up, a corresponding copulatory position, and a median apophysis-paracymbium arresting mechanism in the male palp. Because the mimetids and archaeids construct no snares, the first two characters must be discounted as evidence for their placement in the Araneoidea, and the archaeids are haplogyne spiders in which no paracymbium (or even analogously functioning sclerite) has ever been shown to exist.

The only serious attempt to delimit the Araneoidea by synapomorphic characters is that of Coddington (in press). He reached similar conclusions on the characters mentioned by Lehtinen but suggested that aggregate silk glands (and the sticky silk they produce), flagelliform silk glands, the form of the paracymbium, and two behavioral features of silk attachment during web construction discussed by Eberhard (1982) may provide araneoid synapomorphies. To our knowledge, neither aggregate nor flagelliform glands have been demonstrated to occur in mimetids, archaeids, or the other groups of concern here, and the difficulties of applying paracymbial and web characters to this problem have been noted above. In view of those considerations and of the fact that Coddington was not able to place the mimetids, any of the archaeid groups, or the textricellids and micropholcommatids in his cladogram of araneoid subgroups, we regard the hypothesis

of an expanded Palpimanoidea including those taxa as being currently uncontradicted.

Within the palpimanoid assemblage, the Mimetidae stand clearly as an outgroup to the remainder of the taxa (component 16), which contrast strongly with mimetids and most other spiders in the extreme reduction of their leg spination. A few spines occur (on the posterior legs only) in the Huttoniidae; in all the other taxa, spines are lacking altogether. Similarly, within the non-mimetid taxa, the classical palpimanoids (Palpimanidae, Stenochilidae, and Huttoniidae, component 14) seem to represent the sister group of the remaining taxa (component 13). The classical palpimanoids are united by the presence of spatulate hairs prolaterally on the anterior tibiae, metatarsi, and (usually) tarsi. In two of these families (Stenochilidae and Palpimanidae, component 15) the spatulate hairs are clustered closely and form a unique prolateral scopula; those two families are also united by the loss of the median and posterior spinnerets (which has apparently occurred independently in the Mecysmaucheniidae, component 4). Mr. J. Wunderlich has pointed out to us that the spatulate hairs characteristic of the classical palpimanoids are purported to occur as well in the Baltic amber spiders assigned to the Spatiatoridae by Petrunkevitch (1942), which may thus belong in the classical palpimanoid lineage. Aside from these fossils, hairs of a similar sort and position are known to us only in the true Archaeidae (component 3), where they are most parsimoniously considered an independent acquisition. The classical palpimanoids are also united by having the apodemal lobes of the posterior tracheae fused into a median structure.

The remaining taxa (component 13) are united by having an elevated pars cephalica. Although similarly elevated heads do occur elsewhere, particularly in the araneoid families Anapidae, Symphytognathidae, and Mysmenidae, the elevation in those taxa is limited primarily to the ocular area. In the palpimanoid groups showing this feature, by contrast, the entire pars cephalica, extending back to the level of the fovea, is elevated, so that the slope of the rear of the head is much more abrupt than in most of the araneoid taxa with elevated ocular areas only.

Among the taxa with elevated heads, the four archaeid families (component 11) are united, as argued above, by the unique prolongation of the carapace around the chelicerae, with its consequent elongation of the chelicerae.¹ The tetricellids and micropholcommatids (component 12), on the other hand, are united by the transformation of the anterior booklungs into tracheae; this has, of course, occurred also in various other "apneumone" taxa, but the polyphyly of lungless spiders as a group is already well established.

Among the four archaeid families (component 11), the Holarchaeidae are unique in that in adults the two sides of the carapace below the chelicerae are bridged only by unsclerotized cuticle. In the other three families (component 10), that condition is true only of juveniles, and in adults sclerotized cuticle entirely surrounds the chelicerae. It is possible that the holarchaeids are neotenic in this regard, but in the absence of evidence linking them to only part of the remaining taxa, it is more parsimonious to interpret the holarchaeid condition as the primitive one.

We hypothesize that the true archaeids and the mecysmaucheniids are more closely related to each other (component 9) than to the pararchaeids. Although Lehtinen (1967) compared true archaeids and mecysmaucheniids and found "no similarities . . . except the modification of the carapace and chelicerae," we have discovered two characters that appear to be unique to the two families. The first is the pair of lateral protuberances found on the labrum; these protuberances are most pronounced in mecysmaucheniids like *Mesarchaea* but occur in all known species of both families. The only spiders known to us with any similar modifications of the labrum are the anapids (Platnick and Shadab, 1978, fig. 1), but only a single, median protuberance is found there (users of the "handbook" compiled by Roth, 1982, should note that in his account of the anapids, the labral spur has migrated to the clypeus). The other feature that, to our knowledge, is unique to the Archaeidae and Mecysmauch-

¹ Petrunkevitch (1939, p. 484, fig. 19) claimed to find a similar arrangement in males of *Linyphia* (now *Neriene*) *clathrata* (Sundevall), but we have been unable to corroborate that observation.

eniidae as here delimited is the occurrence of a ring of unsclerotized cuticle near the base of the tarsi of each leg.

The Mecysmaucheniidae (component 4) are united by their tarsal organ morphology; the long sensory spine accompanied by one or more short accessory sensory lobes provides a distinctive appearance. The group is also supported by the loss of four of the spinnerets (with parallelism in the palpimanid-stenochilid lineage and in some zodarioids as well). The two subfamilies we recognize are also supported by apparently synapomorphic features. The zearchaeines (component 5) have a uniquely thickened and bulging clypeus, whereas the mecysmaucheniines (component 6) share both unique chelicerae with three series of peg teeth (two rows on the promargin and a third patch opposite the fang tip) and a distinctive stridulatory system with the cheliceral files grouped into series and the picks formed by modified setal bases on the prolateral surface of the palpal femur. Within the nominate subfamily, only *Aotearoa* retains the plesiomorphic eight eyes; in the other genera (component 7), the anterior median eyes have been lost. Among those genera, *Mecysmauchenius* and *Mecysmauchenioides* (component 8) share a unique spur situated on the retrolateral edge of the cymbium of the male palp, but the interrelationships of

the other genera must remain unresolved until females of *Mesarchaea* are collected.

The Archaeidae (component 3) are united by having an abdomen-petiole stridulatory mechanism of a sort known elsewhere only in male *Cambridgea* (Stiphidiidae); the respiratory system is also distinctive and possibly synapomorphic. Of the four archaeid genera, only the fossil *Eoarchaea* has retained the plesiomorphic, mecysmaucheniid-like carapace shape; in the three other genera (component 2) the pars cephalica is greatly elevated and provided with seta-bearing tubercles. Finally, in *Archaea* and *Austrarchaea* (component 1) the head modifications are carried to the limit and the carapace is constricted to form a neck. Our arrangement is thus in agreement with Legendre's (1970a, fig. 18) perception of *Afrarchaea godfreyi* as "la forme la plus archaïque du groupe" (Legendre, 1975).

It should be noted that the earliest family-group name for any of these spiders appears to be Archaeidae Koch and Berendt (1854). We have nonetheless retained the name Palpimanoidea for the group as it will eventually (when connected to a full cladogram of araneomorphs) be raised to a rank above the family-group level and then will not be subject to replacement on the grounds of priority.

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