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Spiders from Tawhiti Rahi, Poor Knights Islands, New Zealand

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Forty-three spider species were collected on Tawhiti Rahi: three mygalomorphs — *Migas* (Migidae), *Aparua* and *Porrhothele* (Dipluridae) — and 40 araneomorphs belonging to 34 genera in 20 families. Only two species had previously been reported.

While most species are known from the mainland, five genera have one species each that seems to be a distinct Poor Knights form or to have an affinity with more northern populations.

The island displays two striking phenomena. None of the adventive spider species common on the mainland was found on Tawhiti Rahi; and the summit plateau supports strikingly large numbers of *Porrhothele* and *Cambridgea* living amongst the extensive Poor Knights Islands lily (*Xeronema callistemon*) community.

INTRODUCTION

The Poor Knights Islands (35°28′S, 174°44′E) lie 20 km off the east coast of North Auckland, midway between Whangarei and the Bay of Islands. They were designated a Nature Reserve in 1977. In September 1980, members of the Offshore Islands Research Group (O.I.R.G.) spent five days on Tawhiti Rahi, the largest island in the group, but difficult of access.

Spiders were one faunal group that had barely been investigated, with only two species recorded in the literature, so a general collection of the spiders from as many of the island's habitats as possible became the aim. Methods included obtaining spiders directly from webs or retreats, beating foliage, pitfall, pan and malaise traps and leaf litter sampling. Collecting trips at night gave some idea of the spiders' behaviour and abundance; many of the spiders taken while they were active at night did not feature in any of the traps.

Expedition member Dr J. C. Watt (J.C.W.) Entomology Division DSIR obtained spiders during his insect sampling. The specimens were preserved in 70% alcohol and identified at the Otago Museum by the Director, Dr R. R. Forster, or the author (D.J.C.) Methods of study of the genitalia were similar to those outlined in Forster and Wilton (1968). All the specimens collected by D.J.C. are held at the Otago Museum, Great King Street, Dunedin, while those collected by J.C.W. are held at the New Zealand Arthropod Collection, Entomology Division, DSIR, Auckland. Information on litter samples is given by Watt (1982).

The list of species and notes below are given, firstly, in the sequence of families as found in Part 2 of Forster (1968). Secondly, specimens from those families yet to be revised, that is after the Clubionidae, are arranged in the family sequence listed in Part 1 of Forster (1967).

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SUBORDER MYGALOMORPHA

MIGIDAE

***Migas sandageri* Goyen** Figs. 1-4

Mature and immature females found in single — or double — entranced retreats on *Planchonella, Metrosideros, Melicope* and *Dysoxylum* tree trunks, 7/9/80 D.J.C. Male found actively wandering over tree trunk at night, 10/9/80 D.J.C. Male in malaise trap, 150 m above sea level, 7-11/9/80 J.C.W.

Although the Poor Knights specimens are generally similar to those collected from Mokohinau Island by Sandager, the teeth of the tarsal claws differ in detail. Female genitalia are also similar. The male is collected for the first time (Forster and Wilton, 1968).

DIPLURIDAE

Aparua houhora Forst. Fig. 5.

Mature females and immature specimens dug from slanting silk tubes, 6/9/80, D.J.C. Immature specimen from pit trap 80/86, 8-12/9/80, J.C.W.

The silk-lined tubes passed obliquely through the leaf litter and penetrated mineral soil. Many of them had a collar of leaf litter bound by silk that would be effective in keeping surface water from flowing down the tube during rain. The spiders collected have a female genital structure closer to *A. houhora* of the far north than to that of *A. taranga* of the Hen Island (Taranga) 30 km to the south (Forster and Wilton, 1968).

***Porrhothele ?quadrigyna* Forst.** Fig. 6.

Adults of both sexes collected 7-8/9/80 D.J.C.

Young specimens were found in damp crevices in rhyolite outcrops under *Metrosideros* forest 100 m a.s.l. A large and intact web was found in the forks of a large pohutukawa but without the spider. On the plateau area 200 m a.s.l. there was a large population in the leaf bases of the interesting Poor Knights lily (*Xeronema callistemon*). This association is described in detail later. Examination of the genitalia of one female showed the spermathecae to be six-lobed rather than the four lobes in *P. quadrigyna* of Kohukohu and Te Huka populations (Forster and Wilton, 1968). This may indicate that the spiders from the Poor Knights are a new species, but both the study of further island material and the collection of males of mainland *P. quadrigyna* are needed before the separation is of any certainty.

SUB ORDER ARANEOMORPHA

DESIDAE

Subfamily Myroninae

***Hulua convoluta* Forst.**

Common in humid situations. Silk very fine and 'misty' in appearance, 7/9/80 D.J.C. Shag Bay, 40 m a.s.l., litter sample 80/73, 20/9/80, summit plateau, 200 m a.s.l., litter samples 80/67, 80/70, 10-11/9/80, J.C.W.; pan trap 11/9/80 J.C.W.

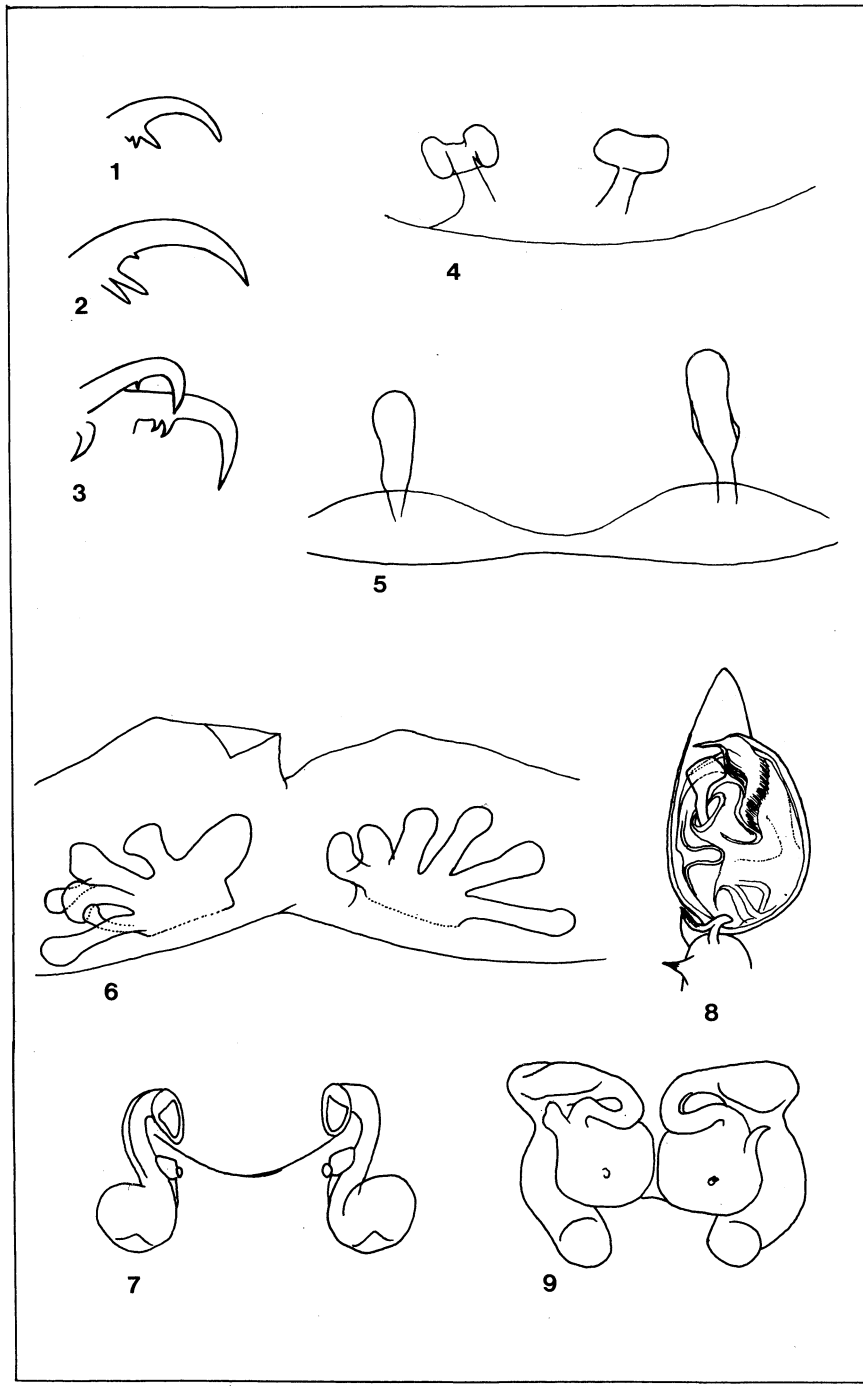
This species is common in small sheet webs against leaf litter and old *Astelia* clumps. It has a wide distribution in the north and was previously collected from the Poor Knights Islands in December 1958 by R. G. Ordish (Forster and Wilton, 1973).

Subfamily Toxopinae

***Hapona* sp.**

Summit plateau, 200 m a.s.l., litter sample 80/68, 10/9/80, J.C.W.

This may be an undescribed taxon (R. R. Forster *pers. comm.*); six species have already been recognised in the Auckland region.



Figs. 1-4: *Migas sandageri* Göyen. Female. Fig. 1—Tarsal claw of palp. Fig. 2—Prolateral view of the proclaw of leg 1. Fig. 3—Prolateral view of the tarsal claws of leg 4. Fig. 4—Internal genitalia from above. Fig. 5—*Aparua houhora* Forst. Female. Internal genitalia from above. Fig. 6—*Porrhothele ?quadrigyna* Forst. Female. Internal genitalia from above. Fig. 7—*Paradictyna rufoflava* (Chamb.) Female. Internal genitalia from above. Figs. 8, 9—*Reinga* sp. Fig. 8—Male palp, ventral view. Fig. 9—Female. Internal genitalia from above.

DICTYNIDAE

***Paradictyna rufoflava* (Chamb.)** Fig. 7

In tent, 10 m a.s.l. 6/9/80, D.J.C. Many found on foliage in both day and night on shrubs such as *Geniostoma,* 8/9/80, D.J.C. Male in pan trap, 10/9/80, J.C.W.

This is the common small spider on foliage. The species ranges over most of the North Island but may show local varieties (Forster, 1970).

STIPHIDIIDAE

***Cambridgea foliata* (L. Koch)**

Two adult males collected from deep retreats in rotten *Metrosideros* branches, 7/9/80, D.J.C. Summit plateau, 200 m a.s.l., many of both sexes in *Metrosideros* and *Xeronema,* 8/9/80 D.J.C.

Those in the lily appear to compete with *Porrhothele* for retreats (see later). This is the dominant sheet web weaver in the forest. The species is widespread in the North Island and the north of the South Island.

***Cambridgea* sp.**

An immature specimen of this unidentified species was collected with *C. foliata,* 9/80, D.J.C.

AMPHINECTIDAE

***Reinga* sp.** Figs. 8, 9.

One female under log with egg sac containing 97 eggs, 6/9/80 D.J.C. male in pit trap 80/79, Shag Bay 40 m a.s.l., 7-12/9/80 J.C.W.

This species spins an irregular and laddered sheet web of whitish, calamistrated silk in rhyolite crevices. In these situations the spider is very inaccessible, being 4-5 cm deep in the retreats. Webs are abundant on vertical or overhanging faces but not on upper surfaces. This species is also quite plentiful on the lower margins of rotten logs and stones lying on the soil. The status of the Poor Knights population is uncertain. The female epigynum is similar to that of *R. apica* Forst., but the internal genitalia are of different structure. Also, the male palp differs from *R. waipoua,* the only species for which Forster and Wilton (1973) give an illustration. The Poor Knights form seems to be intermediate between *apica* and *media.* Further collection and study of both island and mainland populations are required. This species is probably one of the main native spiders that precludes the establishment of large numbers of the Australian *Ixeuticus martius* (see discussion).

***Paramamoea* sp.**

Immature male, pit trap 80/77, 6-12/9/80, J.C.W.

Five species of this genus have been recorded for the North Auckland region.

NEOLANIDAE

***Neolana ?dalmasi* (Marples)** Fig. 10

100 m a.s.l., 7/9/80, D.J.C.

The webs are constructed on shady, overhanging, dry rock surfaces. Internal genitalia are those of *N. dalmasi* as illustrated by Forster and Wilton (1973), but the epigynae suit either *N. dalmasi* or *N. pallida.* The plates covering the booklungs are dark and sclerotised as for *pallida,* but the dorsal abdominal pattern is that of *dalmasi.* No male has been collected. It could prove to be a northern form of *N. dalmasi,* as is the case with the Hen Island and North Auckland *N. septentrionalis.*

INCERTAE SEDIS

***Aorangia mauii* Forst.**

Only females have been collected from small sheet webs constructed just above ground level and extending out from a rotten branch, 7/9/80, D.J.C.

The Poor Knights population matches well with *A. mauii* as described by Forster (Forster and Wilton, 1973). The species has previously been recorded from the Bay of Islands.

GNAPHOSIDAE

***Hypodrassodes* (*maoricus* group)**

***H. maoricus* Dalmas** Fig. 11.

Female identified.

***H. courti* Forst.**

Male identified.

***Hypodrassodes* (*dalmasi* group)**

***H. ?insulanus* Forst.** Figs. 12, 13.

Females identified.

Under rhyolite rock on leaf litter below low growing pohutukawa scrub, 6/9/80, D.J.C. In rotting leaves and leaf bases of toetoe clump on the site of a 23-year-old burn above Shag Bay, 10/9/80, D.J.C. Pan traps, Shag Bay 8-10/9/80. Pit traps 79/76, 80/75, 80/82, 80/84, litter samples 80/67, 80/68, 80/70, 80/71, 80/73, 7-12/9/80, J.C.W. (These species are all very similar in outward appearance, and it is unfortunate that the specimens collected became partly mislabelled during identification and can no longer be directly linked with the collection data given above.)

H. courti and particularly *H. maoricus* have a wide distribution in the North Island. The third species is of special interest, as it seems to be close to the Three Kings Islands form described by Forster in Forster and Blest (1979). The external structure of the epigynum is closer to *H. insulanus* than the related *H. apicus* of Cape Reinga.

CLUBIONIDAE

***Clubiona huttoni* Forst.**

In campsite, 10 m a.s.l., amongst foliage. Widespread on foliage at night 6-8/9/80, D.J.C. Beaten at night 8/9/80, pan trap, Shag Bay, 8/9/80, pan trap 9/9/80, litter sample 80/68, 200 m a.s.l., 10/9/80, Malaise trap, Shag Bay 6-11/9/80, J.C.W.

One was found wrapped in silk as the prey of a species of *Rhomphaea.*

***C. peculiaris* C. L. Koch** Fig. 14.

One female collected at night, 0.6 m from the ground, on the upper surface of a *Nestegis* leaf. Pohutukawa forest, 10/9/80, D.J.C.

This species was previously collected from the Poor Knights by B. J. Marples (Forster and Blest, 1979). Both species are widespread in New Zealand.

LINYPHIIDAE

***Laperousea blattifer* Urquhart**

In upper branches of 1.5 m high *Myrsine divaricata* scrub growing on the 23-year-old burn above the campsite, 30 m a.s.l., 6/9/80, D.J.C.

Either sex was found in small sheet webs. The spiders hid in a woven retreat in the shelter of twigs or under a leaf.

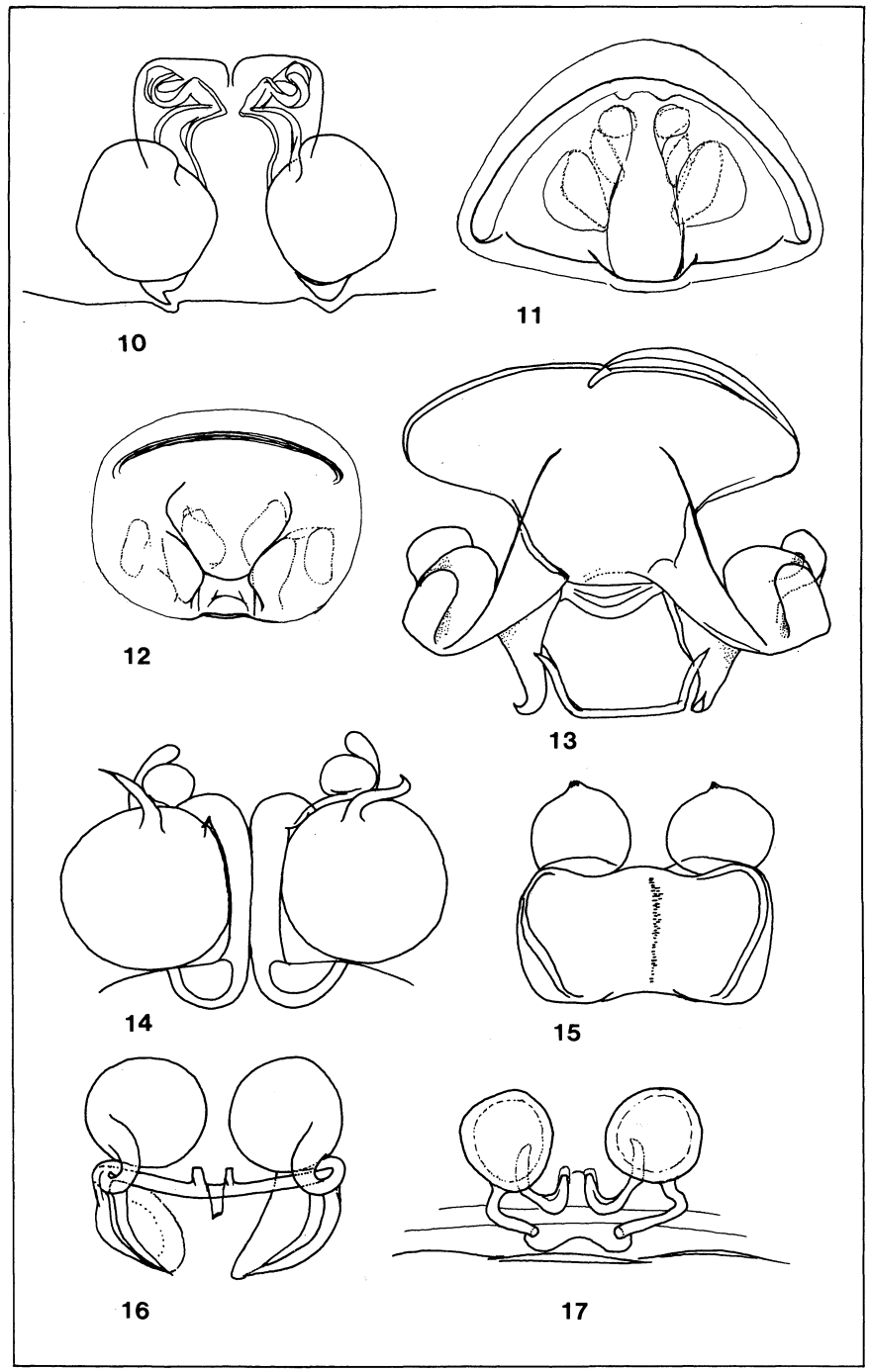


Fig. 10—*Neolana dalmasi* (Marples). Female. Internal genitalia from above. Fig. 11—*Hypodrassodes maoricus* Dalmas. Female. Epigynum. Figs. 12, 13—*H. ?insulanus* Forst. Female. Fig. 12—Epigynum. Fig. 13—Internal genitalia from above. Fig. 14—*Clubiona peculiaris* C. L. Koch. Female. Internal genitalia from above. Figs. 15, 16—*Episinus* sp. Female. Fig. 15—Epigynum. Fig. 16—Internal genitalia from above. Fig. 17—*?Icona* sp. Female. Internal genitalia from above.

***Synotaxus* sp.**

Female with a greatly extended epigynal process. Shag Bay, 6-12/9/80, J.C.W.

DYSDERIDAE

***Pounamua* sp.**

Single specimens in leaf litter from *Metrosideros* forest, 9/9/80, D.J.C. and from litter sample 80/73, Shag Bay, 40 m a.s.l., -/9/80, J.C.W.

SEGESTRIIDAE

***Ariadna* sp.**

In old insect burrows in rotten branches. On the ground under pohutukawa and mahoe forest. One large female was found in an old *Migas* retreat, 7/9/80. In crevices in rhyolite rock above the spray zone, 10/9/80, D.J.C.

LYCOSIDAE

***Lycosa hilaris* Koch**

Coastal scrub of *Coprosma repens,* 10 m from the cliff edge near the campsite, 9/9/80, D.J.C. Shag Bay, 35 m a.s.l., pit trap 79/76, J.C.W.

***Lycosa* sp.**

Pit trap 80/77, 6-12/9/80, J.C.W. Pohutukawa forest 100 m a.s.l., pit trap, 7-12/9/80, J.C.W. East side of summit plateau, 170 m a.s.l., litter sample 80/71, 11/9/80, J.C.W.

This species is more nearly related to European *Lycosa* species.

THOMISIDAE

***Diaea albolimbata* L. Koch**

Many individuals from 2 m high scrub of *Styphelia, Leptospermum* and *Myrsine,* 7/9/80, D.J.C. Beaten from foliage after rain, 10/9/80, D.J.C. Shag Bay, pan trap, 8/9/80, 10/9/80, J.C.W. Shag Bay, malaise trap, 6-11/9/80, J.C.W.

PHILODROMIDAE

***Sidymella angulata* (Urquhart)**

Common at night on leaves of *Carex* aff. *spinirostris* bordering the track to the summit, 8/9/80, D.J.C. Female on leaf of *Corynocarpus* sapling, 10/9/80, D.J.C.

The front two pairs of legs are held out in the ambush pose typical of this family of spiders.

MITURGIDAE

***Miturga* sp.**

Two caught at night on the forest floor; large female wandering on ground near petrel burrows, 10/9/80, J. McCallum; immature female, 10/9/80, D.J.C. No specimens were found in pitfall or pan traps.

This large spider would be capable of seizing even the giant cave weta, *Gymnoplectron giganteum,* but it has not been observed with prey.

THERIDIIDAE

***Achaearanea* sp.**

Lattice webs between crevices in rhyolite boulders and in cracks in tree trunks 10-15 m a.s.l., 6/9/80, D.J.C. Males in pan traps, 10, 11/9/80, J.C.W.

***Argyrodes antipodianus* Camb.**

Attending webs of *Cyclosa trilobata,* 7/9/80, D.J.C. Also noted in webs of *Cambridgea foliata.*

***Episinus antipodianus* Camb.** Figs. 15, 16.

Spiders found individually, and at night 20-30 cm above ground level on single silk strands, 10/9/80, D.J.C. Male, pan trap, 8/9/80, J.C.W.

***?Icona* sp.** Fig. 17

Numbers found at night in the hubs of horizontally inclined orb webs and on single silk strands, 10/9/80, D.J.C. Male, Shag Bay, 6-12/9/80, J.C.W.

At the time of collection it was assumed that these were orb weavers similar to *Nanometa* because of their general appearance and association with an orb web, yet the spinning of orb webs is completely atypical of the *Theridiidae.*

An examination of these colourful, medium-sized spiders showed that they have a typically theridiid tracheal system (Forster, pers. comm.). In January 1982 a similar female specimen from Lady Alice Island, Chickens Group, was collected together with a teardrop-shaped egg sac reminiscent of those of many theridiids. An explanation for this association with orb webs could be that these spiders had pirated the webs of the common forest species of *Tetragnatha.* This type of behaviour has been reported in an overseas theridiid (Forster, pers. comm.), and many theridiids (e.g., *Rhomphaea*) are known to prey on other spiders.

***Rhomphaea* sp.**

Common in *Myrsine divaricata* and *Metrosideros excelsa* scrub, 200 m a.s.l., 10/9/80, D.J.C. One specimen suspended on a single thread had captured and wrapped in silk an immature *Clubiona huttoni.*

***Ulesanus quadratus* Camb.**

Female, 200 m a.s.l., litter sample 80/68, 10/9/80, J.C.W.

MIMETIDAE

***Mimetus* sp.**

Common on single threads spun against tree trunks and on other vegetation, 8/9/80, D.J.C.

ARANEIDAE

***Araneus atrihastulus* (Urquhart)**

Lichen-coloured spiders found adjacent to modified orb webs on slightly overhanging boulders in humid, south facing situations under 10 m high *Metrosideros* forest, 8/9/80, D.J.C.

***Araneus* sp.**

Orb webs were found 1-2 m above the ground within low-growing *Metrosideros* scrub 10-20 m a.s.l., 6/9/80, D.J.C. *Metrosideros* forest, 100 m a.s.l., 10/9/80, D.J.C.

This may be one of the *Epeira* species recognised by Urquhart (1884-94), but it is difficult to interpret many of his descriptions.

***Arachnura feredayi* (L. Koch)**

Web suspended in a breezy place between two *Xeronema* clumps, shaded by *Metrosideros* forest, 200 m a.s.l., 8/9/80, D.J.C.

This species was also found with webs in low scrub such as *Coprosma, Geniostoma, Hedycarya, Melicytus* and *Myrsine.* The webs had the usual v-shaped cut-out in the top of the orb, with a vertical strand of debris extending from the centre, where the spider clings to the upper edge of the web.

***Cyclosa trilobata* Urquhart**

Male and females from a complex of orb webs in a gap between shrubs growing on the site of 23-year-old burn. 7/9/80, D.J.C.

The web complexes were of up to twenty individual orbs, each nearly vertically inclined, and almost parallel to one another. The orbs were 2-6 cm in diameter with a pad of silk in the centre. In some of the webs a stabilimentum containing debris bound with silk was laid down, perhaps forming some sort of cryptic camouflage for the spider. The orb webs were about 20 cm from the ground in open, young *Metrosideros* scrub with *Astelia Pittosporum,* N.Z. flax (*Phormium*) and bracken fern (*Pteridium*) between the larger plants. There were occasional individual webs. *Cyclosa* was seen from 30-200 m a.s.l. A number of females had males waiting on the edge of the webs. One web complex had four commensal quicksilver spiders (*Argyrodes antipodianus*). Egg sacs of *Cyclosa* were found on the apices of *Scirpus nodosus* culms.

***Leucauge dromedaria* (Thorell)**

Immature specimen in 2 m high coastal scrub, 7/9/80, D.J.C.

This spider would become much more obvious in the warmer months of the year.

TETRAGNATHIDAE

***Tetragnatha* sp.**

Male on underside of *Nestegis apetala* shrub under *Metrosideros* forest, 7/9/80, D.J.C. Male, Shag Bay, 6-12/9/80, J.C.W. Pan trap, 9/9/80, J.C.W.

This species is very common throughout the vegetation.

SALTICIDAE

***Trite auricoma* (Urquhart)**

Metrosideros forest with rhyolite boulders, 10 m a.s.l. 6/9/80, D.J.C. 10-m *Metrosideros* forest, 8/9/80, D.J.C. Shag Bay, 200 m a.s.l. litter sample 80/68, 10/9/80, J.C.W.

***T. planiceps* Simon**

Immature specimens that may be of this species, 8/9/80, D.J.C.
Immature spiders beaten from foliage after rain, 10/9/80, D.J.C.
Immature specimen beaten at night, 7/9/80, J.C.W.
Mature female, Shag Bay, pan trap, 10/9/80, J.C.W.

Undescribed forest salticid

An immature specimen with 4-pointed, dark star marking on dorsal surface of the abdomen, 8/9/80, D.J.C.

Undescribed seashore salticid

This species was found in toughly woven retreats in crevices above the splash zone, 12/9/80, D.J.C.

One retreat contained 16 eggs. In dry but overcast weather the speckled white and grey spiders moved over the lichen-covered rock surfaces searching for prey.

These four salticid species have been found on most other islands of the Hauraki Gulf.

?ANAPIDAE

Undescribed genus and species

This 'symphytognathid' was recovered from litter sample 80/68 from the summit plateau, 200 m a.s.l.,/9/80, J.C.W. and is the second collection of this species. The first is from the Noises Island Group in the Hauraki Gulf. From the shape of the abdomen it appears to be similar to *Risdonius* (Anapidae) but this is not certain (Forster, *pers. comm.*) The small spiders of the 'Symphytognathidae' obviously have a much wider distribution than that presently recorded.

DISCUSSION

The forty-three species all belong to previously-recognised groups in the New Zealand spider fauna. Except for the seashore salticid species, they are predominantly forest types, and their habitats are listed in Table 1. It was expected that the native seashore spiders in the genera *Amaurobioides, Gasparia, Otagoa* and *Steatoda* might be found, but the extremely steep cliffs and rough seas precluded any serious search for these. In calmer weather, boat-landings at various points would assist in the search for species on the cliffs.

Table 1—Spider habitats on Tawhiti Rahi Island.

HABITAT	TAXA
Sea cliffs	*Ariadna* sp., Undescribed salticid sp.
"Petrel scrub"	*Achaearanea* sp., *Aparua houhora, Araneus* sp., *Clubiona* spp., *Lycosa hilaris, Paradictyna rufoflava, Reinga* sp., salticid spp., *Tetragnatha* sp.
Open scrub on site of burn	*Cyclosa trilobata, Hypodrassodes* spp., *Laperousea blattifer, Leucauge dromedaria, Tetragnatha* sp., *Trite auricoma.*
Flax swamp	*Clubiona* spp., *Hypodrassodes* spp., *Paradictyna rufoflava, Trite planiceps.*
Myrsine scrub	*Achaearanea* sp., *Aparua houhora, Clubiona* spp., *Hulua convoluta, Hypodrassodes* spp., *?Icona* sp., lycosid spp., *Paradictyna rufoflava, Rhomphaea* sp., *Sidymella* sp., *Tetragnatha* sp.
Metrosideros Forest	
Leaf litter on forest floor: *Aorangia mauii, Aparua houhora, Hapona* sp., *Hulua convoluta, Hypodrassodes* spp., Lycosid spp., *Miturga* sp., *Paramamoea* sp., *Pounamua* sp., *?Risdonius* sp., salticid spp., *Ulesanus quadratus.*	
Old petrel burrows: *Miturga* sp.	
Rotten logs: *Achaearanea* sp., *Aorangia mauii, Ariadna* sp. *Cambridgea* spp., *Hypodrassodes* spp., *Reinga* sp.	
Rhyolite rocks: *Achaearanea* sp., *Neolana ?dalmasi, Porrhothele ?quadrigyna, Reinga* sp., *Trite auricoma.*	
Lily clumps: *Achaearanea* sp., *Arachnura feredayi, Cambridgea foliata, Clubiona* spp., *Hypodrassodes* spp., *Porrhothele quadrigyna.*	
Understorey foliage: *Achaearanea* sp., *Arachnura feredayi, Araneus* sp., *Clubiona* spp., *Diaea albolimbata, Episinus* sp., *?Icona* sp., *Paradictyna rufoflava, Rhomphaea* sp., *Sidymella angulata, Synotaxus* sp., *Tetragnatha* sp.	
Tree trunks: *Achaearanea* sp., *Araneus atri-hastulus, Ariadna* sp., *Cambridgea* spp., *Hypodrassodes* spp., *Trite auricoma* and another salticid sp., *Porrhothele ?quadrigyna* (rare), *Migas sandageri*	

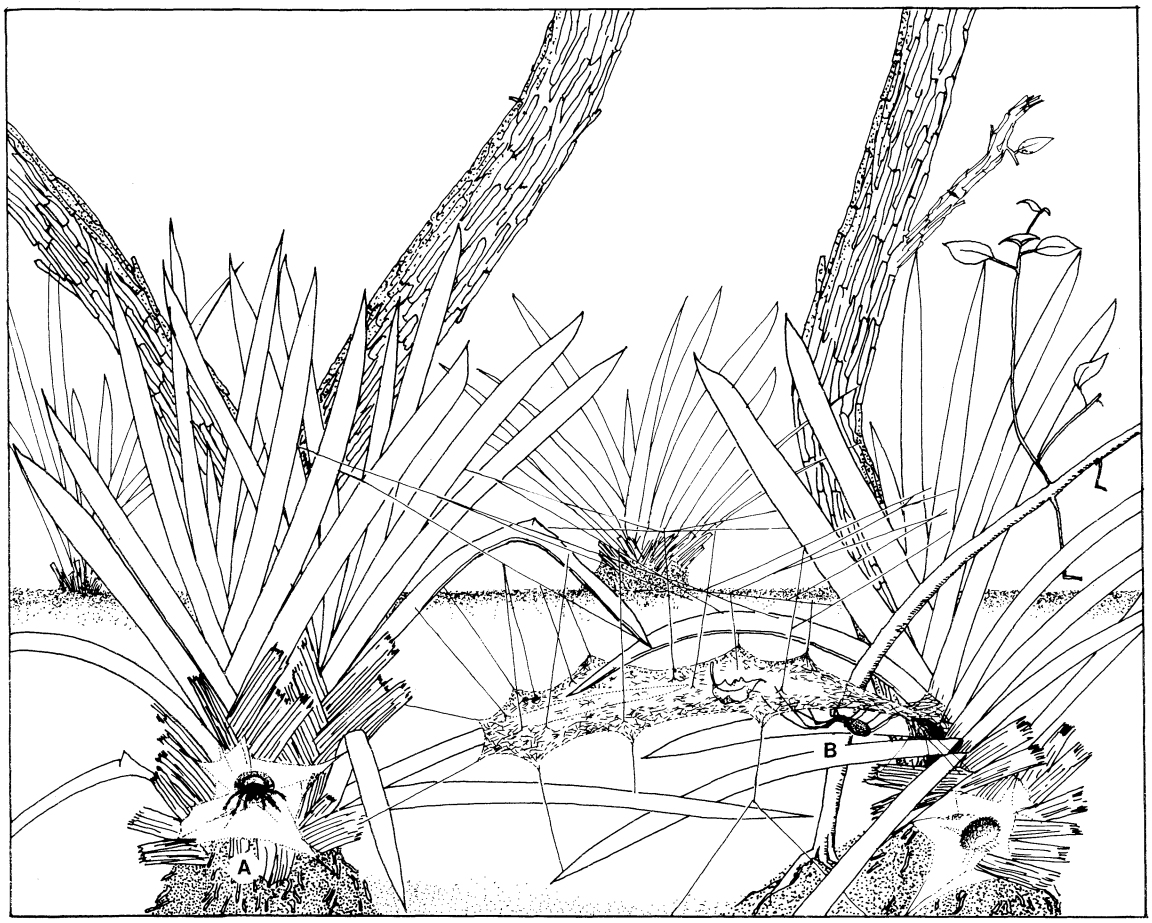


Fig. 18—Arrangement of webs in and between clumps of Poor Knights Islands lily (*Xeronema callistemon*) under pohutukawa (*Metrosideros excelsa*) forest on the summit plateau of Tawhiti Rahi Island 200 metres above sea level. A = *Porrhothele,* B = *Cambridgea.*

As the island is free of introduced mammalian herbivores, and has been generally free from human disturbance for well over a century, the native coastal forest is recovering well from previous occupation by the Maori. As a result the large and diverse fauna of insects and other arthropods provides a base for an extensive range of spider species, from the minute 'symphytognathid' in the leaf litter, to the large *Cambridgea* and *Porrhothele* which would be capable of subduing such insects as the giant cave weta, *Gymnoplectron giganteum.* The spiders would in turn be preyed on by the native skinks and geckoes, by the centipedes *Cormocephalus rubriceps* and *Scutigera* sp., by bellbirds and by other spiders (*Mimetus* sp. and *Rhomphaea* sp.). Further collecting should add considerably to the number of species listed here.

On the summit plateau a sward of Poor Knights Island lily (*Xeronema callistemon*) extends for hundreds of metres under *Metrosideros* forest. This community is remarkable not only for the extent of *Xeronema,* but also for the considerable numbers of the large spiders *Cambridgea foliata* and *Porrhothele ?quadrigyna* whose retreats extend into the dead leaf bases of the lily (Fig. 18). Ten *Xeronema* clumps were examined, and the larger webs were counted. There were 0-5 webs of *Porrhothele* per clump, with an average of 1.5 webs. For *Cambridgea* the range was similar and the average number was 2.1 webs per clump. Thus most lilies had three or four large, web-building spiders

in their leaf bases. *Porrhothele,* being a mygalomorph, may live longer than three years whilst *Cambridgea* probably has a life span exceeding one year. *Xeronema* is an iris-like plant in habit; the long, near-vertical leaves channel rainwater down into the centres of the cup-shaped leaf bases. The whole mass of leaf bases has a good supply of water and would probably be permanently damp. Court (1973) noted that the Great Barrier Island population of *Porrhothele* living above a harbour shoreline also was closely associated with a water supply, in this case, seepage from soil over a rock basement.

Within the community, there are some aging kanuka trees (*Leptospermum ericoides*), which indicates that the community is in a state of change. It could be possible that *Xeronema* will die out as soon as the canopy density increases and in turn could deprive the spiders of this ideal habitat.

Elsewhere on the island, *Porrhothele* is found only sparingly in the damp forks of larger tree trunks and between stones surrounded by damp leaf litter. It was expected that the diplurid genus *Hexathele* would be represented by the northern *H. kohua,* but although this was searched for, it was not found. It was quite common in old insect holes in tree trunks on the nearby mainland. This finding has a parallel in that Whatupuke Island of the Chickens Group (to the south of the Poor Knights Islands) seems also to have only *Porrhothele,* whilst its neighbour, Lady Alice Island, has *Hexathele* as the only diplurid. Further collecting in the Northern Islands will be required before the significance of these interesting distribution patterns can be gauged.

The Australian *Araneus pustulosus* (Walck.) and *Ixeuticus martius* (Simon) have a remarkably wide range throughout New Zealand in disturbed and exposed habitats and are dominant around the harbour of Tutukaka on the nearby mainland. Surprisingly, they were not seen at all on Tawhiti Rahi. The prevailing westerly winds would certainly bring spiderlings from the mainland, but these have not established to any obvious extent. This gave the impression that the incumbent native species already occupying available habitats are able to compete successfully with adventive species and are not displaced.

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REFERENCES

Court, D. J. 1973. Spider populations of Great Barrier Island. *Tane* 19: 179-188.

Forster, R. R. 1967. *The Spiders of New Zealand. Part 1.* Otago Museum Bulletin No. 1.

——— 1970. *The Spiders of New Zealand. Part 2.* Otago Museum Bulletin No. 3.

Forster, R. R., and A. D. Blest 1979. *The Spiders of New Zealand. Part 5.* Otago Museum Bulletin No. 5.

Forster, R. R., and C. L. Wilton 1968. *The Spiders of New Zealand. Part 2.* Otago Museum Bulletin No. 2.

———; ——— 1973. *The Spiders of New Zealand. Part 4.* Otago Museum Bulletin No. 4.

Marples, B. J. 1956. Spiders from the Three Kings Islands. *Records of the Auckland Institute and Museum* 4(6): 329-342.

Watt, J. C. 1982. Terrestrial arthropods from the Poor Knights Islands, New Zealand. *Journal of the Royal Society of N.Z.* 12: 283-320.

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