

## The linyphiid spiders of Micronesia and Polynesia, with notes on distributions and habitats

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### Summary

The new linyphiid genera *Neonesiotes*, *Nesioneta* and *Priscipalpus* are described. They include the new species *Neonesiotes hamatus*, *N. remiformis*, *Nesioneta concinna*, *N. elegans*, *N. lepida*, and *N. similis*. The new species *Maorineta ambigua* is also described, and *Linyphia palmaria* Marples is transferred to the new genus *Priscipalpus*. Another new species is provisionally placed as *Centromerus truki*, and *Aitutakia armata* Marples, 1960 is synonymised with *Eperigone fradeorum* (Berland, 1932). Other linyphiid species recorded from Micronesia and Polynesia are discussed. *Tennesseellum formicum* (Emerton) is reported from the Pacific for the first time. The biogeography of the Pacific linyphiids as presently known is discussed.

### Introduction

The linyphiid fauna of the Pacific region in general is becoming known rather slowly. Berland (1934) listed only seven linyphiid species from the area. Currently we know of 28 described or cited species from Micronesia and Polynesia (Appendix 1), 38 from Australia, 28 from Malaysia, Melanesia and Indonesia (these latter areas still poorly collected), and 102 from New Zealand. No doubt we have overlooked a few species.

Here we present descriptions of 3 new genera and 8 new species of linyphiids from Micronesia and Polynesia, and discuss the other species known from these regions. The new genera and species were described and illustrated by Millidge. Most of the collecting of specimens was done by J. W. and E. R. Berry, with assistance from Beatty. The specimens were sorted to species mostly by Beatty, and representatives of each sent to Millidge. Remaining specimens were identified by Beatty, and the final manuscript assembled by Beatty and Berry jointly. Type specimens of the new species will be deposited in the Bishop Museum, Honolulu, Hawaii. All adult specimens of the new species examined by Millidge are designated as holotypes and paratypes. The symbol "j" is used to indicate an immature specimen. All measurements are in mm.

### Genus *Nesioneta* Millidge, new genus

*Type species: Nesioneta lepida*, new species.

*Etymology:* From the Greek *nesion*, "a small island", and *neta*, "spun". Gender feminine.

*Diagnosis:* The locality of capture (Pacific Islands) is an important diagnostic character for the genus. The females are diagnosed by the epigynum (Figs. 3, 7, 11, 12-13); these are very similar to those of some species of *Lepthyphantes* Menge, but *Nesioneta* differs from that genus by the absence of metatarsal spines. The males are diagnosed by the form of the palpal tibia, which has a prominent apophysis on the ectal side (Figs. 1, 5, 8, 9), and by the form of the embolic division (Figs. 2, 4, 6, 10). The embolic division is quite similar to those of *Maorineta* Millidge (Millidge, 1988a), but the tibial apophyses distinguish these two genera.

*Description:* The four known species have total length 1.4-1.9. The carapace is unmodified in both sexes, and the chelicerae have lateral striae. The male chelicerae have no boss anteriorly. The eyes are moderately large, with the posteriors all less than one diameter apart. The abdomen is grey to black, with variable white markings dorsally and around spinnerets. The legs are moderately long, with tibia I l/d 7-10. The dorsal tibial spines are 2222, and metatarsal and femoral spines are absent. Metatarsi I-III have a trichobothrium, with TmI 0.25-0.3. The female palp is clawless. The tracheal system is similar to that of *Meioneta* Hull (Millidge, 1986). The epigynum is of the *Lepthyphantes* type, with a folded scape which has a small socket distally (Figs. 7, 11). The folded end of the scape is very short, as in e.g. *Lepthyphantes pallidus* (O.P.-Cambr.), and unfolds to only a minor extent when treated with KOH. The male palpal tibia has a well-defined ectal apophysis (Figs. 1, 5, 8, 9). The paracymbium has the distal arm lightly sclerotized, as in *Maorineta*, and the suprategular apophysis ends in a small hook as in that genus. The embolic division of the palp (Figs. 2, 4, 6, 10) is similar to those of *Maorineta*; the radical part is rather similar in shape to those of *Meioneta*, but the lamella is a simple extension of the radical part, rather than a separate sclerite as in *Meioneta*. The embolus is short, and lies in a mass of lightly sclerotized material between the radical part and the lamella. In addition to the embolus, there may be other minor sclerites, difficult to see, lying amongst this lightly sclerotized material. The palpal organ does not have a Fickert's gland.

*Included species: Nesioneta lepida* n.sp., *N. concinna* n.sp., *N. elegans* n.sp. and *N. similis* n.sp.

*Distribution:* Pacific Islands.

*Taxonomic position:* This genus lies in the Micronetinae, with *Meioneta*, *Lepthyphantes*, etc. It seems probable that *Nesioneta* is a close relative of *Maorineta*, which is found in the same general area.

### *Nesioneta lepida* Millidge, new species (Figs. 1-4)

*Type:* Male holotype from Marshall Islands, Kwajalein Atoll, Ennugarret I., 27 July 1969 (J. W. Berry); deposited in Bishop Museum, Honolulu.

*Etymology*: The specific name is a Latin adjective meaning "elegant, neat".

*Diagnosis*: The female is diagnosed by the epigynum (Fig. 3). The male is diagnosed by the form of the embolic division (Figs. 2, 4) and by the palpal tibia and paracymbium (Fig. 1); these need to be distinguished from those of *N. elegans* (Fig. 9).

*Female*: Total length 1.75-1.9. Carapace length 0.6-0.65. Carapace yellow to orange-brown, with faint dusky markings. Abdomen grey, with dorsally a white spot anterior to spinnerets, and often with a white bar or chevron anteriorly. Sternum orange, suffused with grey. Legs pale yellow to orange; chaetotaxy and trichobothria typical of the genus. Epigynum (Fig. 3).

*Male*: Total length 1.55-1.65. Carapace length 0.7-0.75. Colour and chaetotaxy as female. Palp (Figs. 1, 2, 4).

*Records*: MARSHALL ISLANDS: Kwajalein Atoll, Ennugarret I., 1♀, 23 July 1969, in *Pandanus* litter, 1♀, 28 July 1969, pitfall in grassy area, 2♂ (holotype and paratype) 2♀ (paratypes) 2j, 27 July 1969, in grass clumps; Ennylebegan I., 1♂ 5♀ 1j, 21 July 1969, coconut-breadfruit litter, 1♂ 1j, 25 July 1969, coconut-*Pandanus* and grass litter, 1♂ 1♀, 25 July 1969, litter in *Wedelia* thicket; Kwajalein I., 2♀, 20 July 1969, in garbage heap, 1♂ 2♀, 8 Aug. 1969, in beach litter; Roi-Namur I., 1♀ 1j, 10 July 1968, litter at base of coconut tree, 1♂ 3♀ 1j, 22 July 1969, litter in *Wedelia* thicket, 6♀ 3j, 27 July 1969, in grass clumps; South Gugeegu I., 1♂ 4♀ 1j, 24 July 1969, *Scaevola-Pandanus* litter, all collected by J. W. Berry.

Majuro Atoll, Arniel I., 1♂ 1♀ 3j, 1 Aug. 1969, litter in open grassy area in coconut forest; Arurakku I., 1♂, 1♀, 2j, 3 Aug. 1969, in *Scaevola* litter; Majuro I., 1♀, 2 Aug. 1969, coconut-breadfruit litter; Rairikku I., 1♀, 1 Aug. 1969, under *Ipomoea* on beach rubble; Renimyo I., 1♂ 5♀, 6 Aug. 1969, in grass clumps on beach; Rotain I., 1♂ 2♀ 1j, 3 Aug. 1969, litter in grassy area; Uliga I., 1♀ 1j, 5 Aug. 1969, under beach rubble; Uotjaa I., 1♂ 2♀ (paratypes), in grass litter, 26 July 1968; all collected by J. W. Berry.

CAROLINE ISLANDS: Palau (=Belau) District, Angaur, 2♂ 10♀ (paratypes) 3j, 30 Apr. 1973, breadfruit-*Casuarina* litter, J. A. Beatty, J. W. Berry; Kayangel, 2♂ 5♀ 2j, 21 May 1973, coconut-*Barringtonia* litter, 2♂ 1j, 22 May 1973, coconut litter, 1♀, 22 May 1973, shaken from tree, J. W. Berry; Koror I., 1♀, 9 Mar. 1973, banana litter, 6♂ 22♀ 6j, 15 Mar. 1973, compost heap, 2♂ 6♀ 7j, 24 Mar. 1973, compost heap, 1♂ 2♀, 26 Mar. 1973, litter at edge of taro patch, 1♀ 1j, 30 Mar. 1973, litter at edge of taro patch, 2♀, 3 Apr. 1973, litter at edge of taro patch, J. W. Berry, J. A. Beatty; Peleliu I., 1♀, 22 Mar. 1973, breadfruit litter on sandy soil, J. W. & E. R. Berry; Sonsorol I., 3♀ 2j, 6 Apr. 1973, forest litter, J. W. & E. R. Berry; Tobi I., 2♂, 8 Apr. 1973, forest litter, J. W. & E. R. Berry.

Yap Islands, Gagil-Tomil I., Wanyan, 1♂ 5♀ 2j, 17 Apr. 1980, in litter, 2♂ 1♀ 5j, 29 May 1973, in litter on roadside bank, 1♂, 29 May 1973, in web of *Cyrtophora moluccensis* (Doleschall), J. A. Beatty, J. W. & E. R. Berry; Map I., Chool, 1♂ 5♀, 12 Apr. 1980, in litter, J. A. Beatty, J. W. Berry; Yap I., Worowo, 1♀, 25

Jan. 1980, in *Pandanus-Hibiscus* litter; Fedor, 2♂ 1♀, 13 Apr. 1980, in short grass; Giliman Point, 1♂ 4♀ 4j, 15 Apr. 1980, in beach litter; Fanif, 1♀, 16 Apr. 1980, in litter; Giliman Point, 1♂ 4♀ 4j, 29 May 1973, under coconut husks and other beach litter; near Fanif, 1♂, 31 May 1973, in woodland litter; Colonia, 7♂ 1♀ 1j, 1 June 1973, in grass in cemetery, J. W. & E. R. Berry, J. A. Beatty.

*Natural history*: Adults of both sexes were collected in every month from March through August, females also in January. Most individuals were found in litter, some in grass clumps, garbage or compost heaps, under *Ipomoea* mats, under beach rocks, and one in a web of *Cyrtophora moluccensis*.

#### *Nesioneta concinna* Millidge, new species (Figs. 5-8)

*Type*: Male holotype from Cook Islands, Rarotonga, Taakoka I., 23 March 1987 (J. W. & E. R. Berry); deposited in Bishop Museum, Honolulu.

*Etymology*: The specific name is a Latin adjective meaning "pleasing, neat".

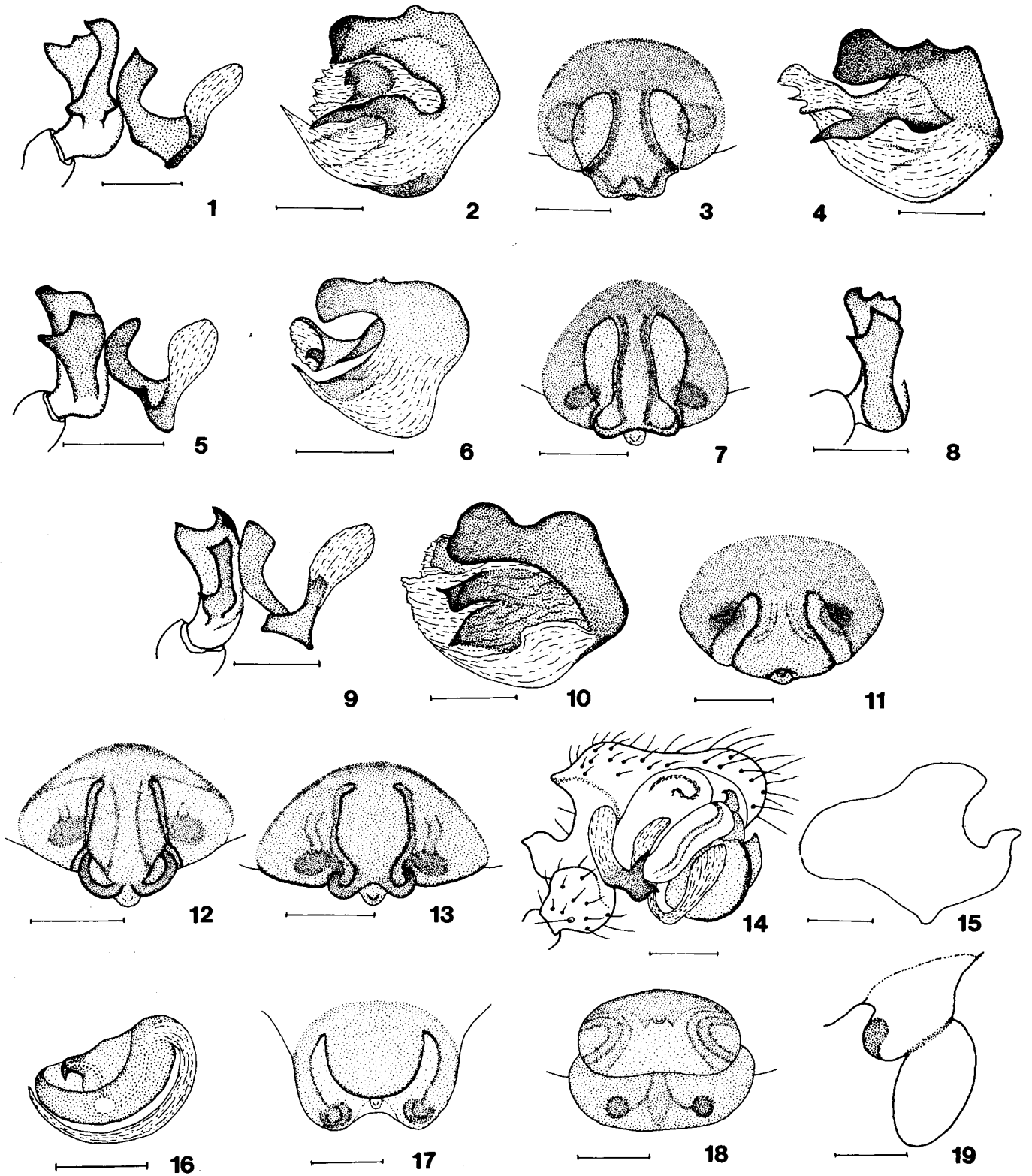
*Diagnosis*: The female is diagnosed by the epigynum (Fig. 7), which has a fairly long scape, narrow at its base. The male is diagnosed by the form of the embolic division (Fig. 6) and the palpal tibia and paracymbium (Fig. 5).

*Female*: Total length 1.55-1.65. Carapace length 0.6-0.65. Carapace pale yellow to pale orange, with faint dusky markings. Abdomen grey to black, with dorsally a white spot anterior to spinnerets, and sometimes a white bar or chevron anteriorly. Sternum orange, suffused with black, to almost black. Legs yellow to orange; spines and trichobothria typical of genus. Epigynum (Fig. 7).

*Male*: Total length 1.45. Carapace length 0.6-0.65. Colour and chaetotaxy as female. Palp (Figs. 5, 6); a male from Society Islands has small differences in the palpal tibia (Fig. 8) and in the embolic division, and may possibly represent a different species (it is, therefore, not designated as a paratype).

*Records*: CAROLINE ISLANDS: Truk Atoll, Moen I., 1j, 12 June 1973, shaken from tree, J. A. Beatty, J. W. Berry.

COOK ISLANDS: Rarotonga I., Arorangi, 2♂ 3♀ 5j, 3 Mar. 1987, coconut litter along Ara Metua, J. W. & E. R. Berry, 3♀ 6j, 4 Mar. 1987, in grass litter, J. W. & E. R. Berry, 5♂ 3♀ 47j, 12 Mar. 1987, in dead coconut frond pile, J. A. Beatty, J. W. Berry, 1♂ 4♀ (paratypes) 5j, 13 Mar. 1987, in dead coconut fronds, J. W. Berry, J. A. Beatty, 2♀, 14 Mar. 1987, litter on roadside bank, J. A. Beatty; Raemaru, 1♀, 24 Mar. 1987, J. W. Berry; inland from Muri Beach, 1♀, 4 Mar. 1987, litter along stream, J. W. Berry; Tuoro Hill, 1♀, 10 Mar. 1987, in grass clump, J. W. Berry; Muri, 1♀, 24 Mar. 1987, J. W. Berry, J. A. Beatty, 4♀ 3j, 25 Mar. 1987, in litter, J. W. Berry; Taakoka I., 10♀ 3j, 19 Mar. 1987, J. W. & E. R. Berry, 9♂ 30♀ 17j, 20 Mar. 1987, in litter, J. W. & E. R. Berry, 2♂ (holotype and paratype) 10♀ (paratypes) 5j, 23 Mar. 1987, thin forest litter on vine-covered rocky ground; Oneroa I., 6♂ 6♀ 3j, 21 Mar. 1987, beach litter, J. W. & E. R. Berry, 2♂ 2♀ 2j, 21 Mar. 1987, in litter, J. W. & E. R. Berry;



Figs. 1-4: *Nesioneta lepida* n. sp. **1** Male palpal tibia and paracymbium, ectal; **2** Embolic division, mesoventral, embolus retracted; **3** Epigynum, ventral; **4** Embolic division, mesoventral, embolus extended.  
 Figs. 5-8: *Nesioneta concinna* n. sp. **5** Male palpal tibia and paracymbium, ectal; **6** Embolic division, mesoventral; **7** Epigynum, ventral; **8** Palpal tibia and paracymbium, Society Islands specimen.  
 Figs. 9-11: *Nesioneta elegans* n. sp. **9** Male palpal tibia and paracymbium, ectal; **10** Embolic division, mesoventral; **11** Epigynum, ventral.  
 Figs. 12-13: *Nesioneta similis* n. sp. **12** Epigynum, ventral; **13** Epigynum, posterior.  
 Figs. 14-19: *Neonesiotes remiformis* n. sp. **14** Male palp, ectal; **15** Male cymbium, mesal; **16** Embolic division, mesoventral; **17** Epigynum, ventral; **18** Epigynum, posterior; **19** Epigynum, lateral.  
 Scale lines = 0.1mm.

Motutapu I., 1♀, 22 Mar. 1987, under coral rubble on beach, J. W. Berry.

Aitutaki I., near airstrip, 1♀, 27 Mar. 1987, in coral rubble, J. W. Berry, J. A. Beatty; Anaunga, 1♀ 2j, 27 Mar. 1987, in *Scaevola* litter, J. W. Berry, J. A. Beatty; Amuri, 1♀ 2j, 30 Mar. 1987, in litter on hilltop, J. W. Berry, J. A. Beatty, 1♂ 1♀, 2 June 1987 in beach rubble, J. W. Berry; Maina Motu, 1♂ 2♀, 3 June 1987, on beach, J. W. Berry, 1♂ 3♀, coconut forest, J. W. Berry.

SOCIETY ISLANDS: Moorea I., Paopao, 1♂, 19 Feb. 1987, in grass clump on beach, J. W. Berry.

TUAMOTU ISLANDS: Rangiroa Atoll, Avatorua I., 1♀ (paratype), 7 June 1987, E. R. Berry.

MARQUESAS ISLANDS: Nuku Hiva I., Taiohae, 4♂ 5♀, 21 Jan. 1987, litter in grassy area, elev. 200m, 1♂ 1♀ (paratypes), 24 Jan. 1987, litter in yard; Muake Peak, 1♂ 9♀ 2j, 23 Jan. 1987, pine forest litter, elev. 800m; Taipivai, 1♀, 27 Jan. 1987, in litter; Toovii, 1♀, 29 Jan. 1987, in grass clump, elev. 600m; Hiva Oa I., Hanamenu, 1♂ 1♀, 4 Feb. 1987, scrub forest litter, 50m; Atuona, 1♀, 10 Feb. 1987, beach litter, 2♀, 11 Feb. 1987, grass litter near harbour, J. W. & E. R. Berry.

*Natural history:* Adults of both sexes were taken in every month from January through April, and in June. Specimens were found mostly in litter on beaches, in fields and in forests, also hidden in grass clumps and shaken from trees.

#### *Nesioneta elegans* Millidge, new species (Figs. 9-11)

*Type:* Male holotype from Fiji, Viti Levu I., near Nausori, 8 May 1987 (J. W. Berry); deposited in Bishop Museum, Honolulu.

*Etymology:* The specific name is a Latin adjective meaning "elegant".

*Diagnosis:* The female is diagnosed by the epigynum (Fig. 11), which has a short scape, and is not likely to be confused with that of the other species. The male is diagnosed by the form of the embolic division (Fig. 10), and the palpal tibia and paracymbium (Fig. 9); the latter are somewhat similar to those of *N. lepida* (Fig. 1).

*Female:* Total length 1.5. Carapace length 0.6-0.65. Carapace yellow-brown, with dusky markings. Abdomen grey, with dorsally a white bar or chevron anteriorly, and a white blotch anterior to spinnerets. Sternum orange, suffused with black. Legs pale orange; spines and trichobothria typical of genus. Epigynum (Fig. 11).

*Male:* Total length 1.5. Carapace length 0.6. Colour and chaetotaxy as female. Palp (Figs. 9-10).

*Records:* CAROLINE ISLANDS: Ponape I., E. of Kolonia, 1♂, 7 June 1973, under litter in open field, J. A. Beatty, J. W. Berry; Truk Atoll, Moen I., 1♂, 12 June 1973, in coconut litter, J. A. Beatty, J. W. Berry.

FIJI: Viti Levu I., Lami Beach, 1♀, 3 May 1987, litter under shrubs, J. W. Berry, J. A. Beatty; Suva, Samabula, 1♀, 4 May 1987, leaf litter in yard, J. W. Berry, 1♀, 9 May 1987, grass litter, J. W. Berry; 1.7 km S. of Naiborebore, 1♂ (holotype) 2♀ (paratypes), 8 May 1987, in grass litter, J. W. Berry; sand dunes W. of

Sigatoka, 1♀, 12 May 1987, in litter, J. W. Berry, J. A. Beatty; Colo-i-Suva Forest Reserve, 1♀, 20 May 1980, in litter in dense ridgetop forest, J. A. Beatty.

*Natural history:* Adults were taken in May and June. All specimens were found in litter in areas ranging from open fields near sea level to dense wet ridgetop forest at an elevation of about 300m.

#### *Nesioneta similis* Millidge, new species (Figs. 12, 13)

*Type:* Female holotype from Caroline Islands, Ponape I., near Kolonia, 7 June 1973, J. A. Beatty & J. W. Berry, deposited in Bishop Museum, Honolulu.

*Etymology:* The specific name is a Latin adjective meaning "similar".

*Diagnosis:* The female is diagnosed by the epigynum (Figs. 12, 13), which has a broad scape easily distinguished from those of the other species. The male is not known.

*Female:* Total length 1.4. Carapace length 0.55. Carapace yellow, with dusky markings and margins. Abdomen grey-black, with dorsally a broad white chevron anteriorly, and a large white spot near the spinnerets. Sternum yellow, suffused with grey. Legs pale yellow; chaetotaxy and trichobothria typical of genus. Epigynum (Fig. 12, 13).

*Records:* Only the holotype.

*Natural history:* The female was adult in June. Habitat was litter in an open field.

#### Genus *Neonesiotes* Millidge, new genus

*Type species:* *Neonesiotes remiformis*, new species.

*Etymology:* From the Greek *neos* "new" and *nesiotes*, "an islander". Gender masculine.

*Diagnosis:* The locality of capture (Pacific Islands) is an important diagnostic character for the genus. The females are diagnosed by the form of the epigynum, which is a broad scape carrying in a notch at the posterior end a tiny scape with socket (Figs. 17, 23). The epigynum is very similar to that of *Atopogyna* Millidge, but in the latter genus the posterior scape/socket is larger and in a deeper notch. The males are diagnosed by the palp, and particularly by the form of the embolic division (Figs. 16, 22); the shape of the cymbium, which is drawn out posteriorly on the mesal side (Figs. 15, 21), is a confirmatory character.

*Description:* The two known species have total length 1.4-1.7. The carapace is unmodified in both sexes. The chelicerae have lateral striae, and in the male carry a pointed boss anteriorly. The eyes are moderately large, with the posteriors less than 1 diameter apart. The abdomen is grey and unpatterned. The legs are relatively long and slender, with tibia I l/d 12-15. The dorsal tibial spines are 2222, and there are no metatarsal or femoral spines. Metatarsi I-III have a trichobothrium, with TmI c. 0.2. The female palp is clawless. The tracheae are confined to the abdomen, and comprise four moderately stout tubes, which open to the exterior via an atrium. The median tubes are longer than the laterals. The epigynum is similar in all the species, with a broad scape which carries posteriorly in a small notch a tiny secondary scape with a socket (Figs. 17, 23). The

genital openings are situated posteriorly on the dorsal side of the broad scape, and the ducts follow a simple pathway from the spermathecae to the openings (Fig. 25). The male palp has the cymbium produced posteriorly on the mesal side (Figs. 15, 21), and the paracymbium may be in part lightly sclerotized. The suprategular apophysis has a sharp point distally. The embolic division of the palpal organ is distinct from that of any other linyphiid genus. The radical part is in the form of a shallow "U", and the short, hook-shaped embolus is embedded in lightly sclerotized material in the concavity of the radical part (Figs. 16, 22); there is a clear "Fickert's gland". A long, membranous lamella arises from near the posterior end of the radical part, and curves around to the ectal side of the palp; in one species there are two lamellae.

*Included species:* *Neonesiotes remiformis*, n.sp. and *N. hamatus*, n.sp.

*Distribution:* Pacific Islands: Marshall Islands, Caroline Islands and Fiji.

*Taxonomic position:* The shape of the palpal cymbium is reminiscent of *Centromerus* Dahl, but in *Neonesiotes* the embolic division is different from those of *Centromerus*, the chelicerae have a boss anteriorly (absent in *Centromerus*), and metatarsal spines are absent (present in *Centromerus*). The epigynum of *Neonesiotes* is close to that of *Atopogyna*, but the embolic division is quite different from *Atopogyna*. It seems probable that *Neonesiotes* is closer to *Atopogyna* than to *Centromerus*.

#### *Neonesiotes remiformis* Millidge, new species

(Figs. 14-19)

*Type:* Male holotype from Marshall Islands, Majuro Atoll, Arniel I., 1 Aug. 1969 (J. W. Berry); deposited in Bishop Museum, Honolulu.

*Etymology:* The specific name is a Latin adjective (from the noun *remus*, a paddle), meaning "in the shape of a paddle", referring to the lamella.

*Diagnosis:* The female is diagnosed by the epigynum (Figs. 17-19). The male is diagnosed by the form of the embolic division (Fig. 16), the lamella of which is broad and paddle-shaped ectally (Fig. 14). The shape of the cymbium (Fig. 15) separates *N. remiformis* from *N. hamatus* (Fig. 21).

*Female:* Total length 1.65. Carapace length 0.7. Carapace yellow to orange-brown. Abdomen grey. Sternum yellow to orange, faintly suffused with grey. Legs pale yellow to orange-brown. Spines and trichobothria typical of genus. Epigynum (Figs. 17-19).

*Male:* Total length 1.45. Carapace length 0.7. Colour and chaetotaxy as female. Palp (Figs. 14-16).

*Records:* MARSHALL ISLANDS: Kwajalein Atoll, Ennylebegan I., 1♀, 21 July 1969, coconut-breadfruit litter, 6♀ 1j, 25 July 1969, coconut-*Pandanus* litter and *Wedelia* litter; South Gugeegu I., 1♂ 1♀, 24 July 1969, *Scaevola-Pandanus* litter, J. W. Berry.

Majuro Atoll: Arniel I., 2♂ (holotype, paratype) 1♀ (paratype), 1 Aug. 1969, grass litter in coconut forest; Arurakku I., 1♂ 2j, 3 Aug. 1969, in *Scaevola* litter; Ejit I., 1♂ 1♀ 1j, 27 July 1968, *Pandanus* litter,

1♀, 5 Aug. 1969, litter in *Ipomoea-Wedelia* comm.; Garra I., 2♂ 3♀, 4 Aug. 1969, *Pandanus* litter; Majuro I., 1♂ 1♀, 24 July 1969, wet forest litter; Uotjaa I., 4♂ 2♀ 2j, 25 July 1968, coconut litter, 1♀, 26 July 1968, coconut litter, J. W. Berry.

CAROLINE ISLANDS: Palau District, Koror I., 1♀, 13 Feb. 1973, litter in second growth forest, 2♂ 2♀ (paratypes), 20 Feb. 1973, banana litter, 1♀, 13 Mar. 1973, litter in second growth forest, 1♀, 26 Mar. 1973, litter at edge of taro patch, 1♂ 1♀ 2j, 30 Mar. 1973, litter at edge of taro patch, 2♂ 2♀, 2 Apr. 1973, litter at edge of taro patch, J. W. Berry, J. A. Beatty.

Yap Islands, Gagil-Tomil I., Wanyan, 1♀, 17 Apr. 1980, in litter; Map I., Chool, 1♀, 12 Apr. 1980, in litter; Yap I., Colonia, 4♂ 2♀, 28 May 1973, litter on burned-over hilltop near high school, 1♀, 10 Apr. 1980, forest litter; road to Fanif, 1♂ 2♀, 31 May 1973, woodland litter; Fanif, 1♀, 16 Apr. 1980, in litter; Fedor, 1♂ 2♀, 7 Feb. 1980, coconut litter, 1♂, 20 Apr. 1980; Giliman Point, 1♂ 1♀, 29 May 1973, under coconut husks, 1♀, 15 Apr. 1980, beach litter, 1♂ 2♀, 15 Apr. 1980, under rocks, J. W. Berry, J. A. Beatty.

Truk Atoll, Moen I., 1♂, 12 June 1973, shaken from tree, J. A. Beatty, J. W. Berry.

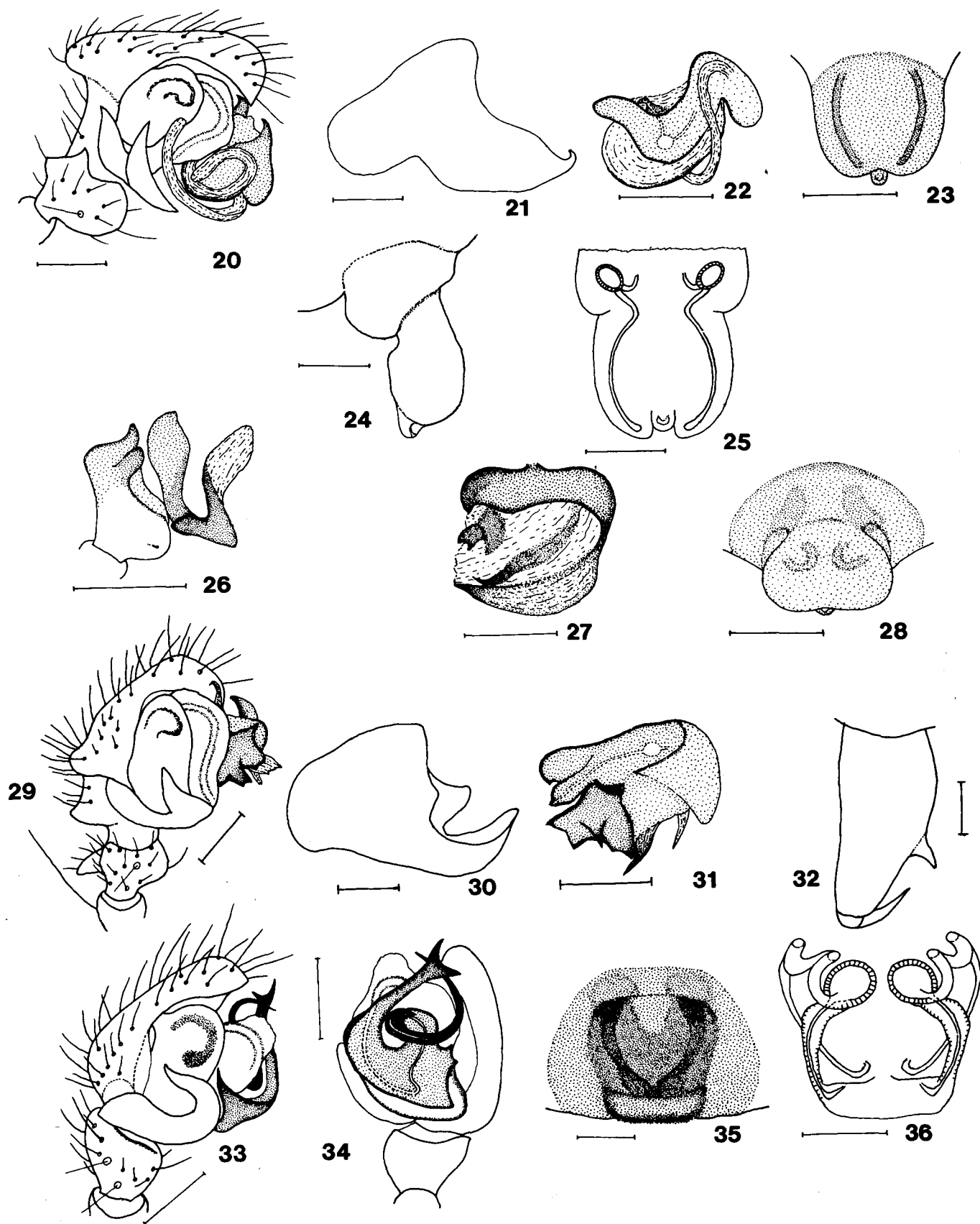
Ponape I., Uh, 1♀, 27 Mar. 1980, in pile of coconut husks, J. A. Beatty; Kolonia, 1♂, 7 June 1973, on building; E. of Kolonia, 1♀, 7 Jun. 1973, in litter in open field, 2♀, 8 June 1973, litter in breadfruit-ivory nut palm forest; Sokeh's Head, 1♂ 2♀, 8 June 1973, wet forest litter, 1♀, 9 June 1973, under coconut husks, 2♂ 5♀, 9 June 1973, litter at edge of taro patch, J. W. Berry, J. A. Beatty.

FIJI ISLANDS: Viti Levu I., 22.4 km W. of Suva, 2♂ 3♀ (paratypes) 1j in litter, 1♀ on shrubbery, 5 May 1987, 1♂ 1♀ 1j, 5 May 1987, in litter in wet forest; Namosi Road 3.4 km N. of Queen's Road, 2j, 7 May 1987, swept in field along stream; 1.7 km S. of Naiborebore, 3♂ 4♀, grass litter; Deuba (Pacific Harbour), 1♀, 10 May 1987, *Scaevola* litter; Colo-i-Suva Forest Reserve, 3♀, 11 May 1987, litter in open area, 2♀, 15 May 1980; Nadarivatu, 1♂ 1♀, 14 May 1987, litter under eucalyptus, 25.7 km W. of Suva, 1♀, 16 May 1980, hill forest; Nausori, 3♀, 18 May 1987, shaken from lower leaves on banana; Sigatoka Research Station, 1♂, 21 May 1987, litter under shrubs; 9 km W. of Suva, 1♂ 2♀, 23 May 1987, in grass litter; 0.5 km E. of Komave, 1♀, 24 May 1987, in coral rubble on beach; 4.8 km S. of Serea, 1♂, 30 May 1987, on forest tree, J. A. Beatty, J. W. & E. R. Berry.

AMERICAN SAMOA: Tutuila I., Fagatogo, 3♀, 13 July 1973, under coconut husks, J. A. Beatty.

COOK ISLANDS: Rarotonga I., Arorangi, 1♀ (paratype), 13 Mar. 1987, under coconut fronds, J. W. Berry.

*Natural history:* Adults of both sexes were collected in every month from February through August, except that no males were taken in March. Most specimens were taken from leaf litter of a variety of trees, others were in piles of coconut husks, under rocks, on tree trunks and buildings, in coral rubble on beaches, shaken from trees and shrubs, and one was taken from a small web attached to the ground in wet forest.



Figs. 20-25: *Neonesiotes hamatus* n. sp. 20 Male palp, ectal; 21 Male cymbium, mesal; 22 Embolic division, mesoventral; 23 Epigynum, ventral; 24 Epigynum, lateral; 25 Epigynum, cleared, dorsal.

Figs. 26-28: *Maorineta ambigua* n. sp. 26 Male palpal tibia and paracymbium, ectal; 27 Embolic division, mesoventral; 28 Epigynum, ventral.

Figs. 29-32: *Centromerus truki* n. sp. 29 Male palp, ectal; 30 Male palpal cymbium, mesodorsal; 31 Embolic division; 32 Right male chelicera, anterolateral.

Figs. 33-36: *Priscipalpus palmarius* (Marples). 33 Male palp, ectal; 34 Male palp, mesoventral to show embolic division; 35 Epigynum, ventral; 36 Epigynum, cleared, dorsal.

Scale lines = 0.1mm.

***Neonesiotes hamatus* Millidge, new species** (Figs. 20-25)

*Type*: Male holotype from Caroline Islands, Palau District, Arakabesan I., 16 Feb. 1973 (J. W. Berry); deposited in Bishop Museum, Honolulu.

*Etymology*: The specific name is a Latin adjective meaning "hooked", referring to the hook at the posterior end of the palpal cymbium.

*Diagnosis*: The female is diagnosed by the epigynum (Figs. 23-25), which differs somewhat in appearance from that of *N. remiformis*, and has the secondary scape projecting more posteriorly. The male is diagnosed by the form of the embolic division (Fig. 22), which has a slender lamella which curves around to the ectal side of the palp, and a second stouter lamella which becomes slender on the ectal side (Fig. 20). The cymbium (Fig. 21) terminates posteriorly in a small hook.

*Female*: Total length 1.45-1.65. Carapace length 0.65-0.7. Carapace brown to deep orange-brown. Abdomen grey to almost black, darker ventrally. Sternum brown, suffused with black. Legs pale yellow to yellow-brown. Leg spines and trichobothria typical of genus. Epigynum (Figs. 23-25).

*Male*: Total length 1.55. Carapace length 0.65. Colour and chaetotaxy as female. Palp (Figs. 20-22).

*Records*: CAROLINE ISLANDS: Palau District, Babelthuap I., Nekkin, 1♀ (paratype), in mixed forest litter, 1♀ 1j, on low shrubs, 3 Feb. 1973, J. W. & E. R. Berry; Arakabesan I., 1♂ (holotype) 5♀ (paratypes) 1j, 16 Feb. 1973, 2♀ 2j, 22 Feb. 1973, litter in mixed lowland forest, J. W. & E. R. Berry.

*Natural history*: All specimens were taken in February in litter in forests.

**Genus *Maorineta* Millidge, 1988*****Maorineta ambigua* Millidge, new species** (Figs. 26-28)

*Type*: Male holotype from Caroline Islands, Palau District, Pulo Anna I., 7 Apr. 1973 (J. W. & E. R. Berry); deposited in Bishop Museum, Honolulu.

*Etymology*: The specific name is a Latin adjective meaning "uncertain".

*Diagnosis*: The female is diagnosed by the epigynum (Fig. 28), which is very similar to those of the New Zealand species; diagnosis must therefore be based also on the geographical location of capture. The male is diagnosed by the palp (Figs. 26, 27). The palpal tibia is quite distinct from the tibiae of those New Zealand species which lack the swollen tibia I, and also distinct from the palpal tibiae of the *Nesioneta* species. The embolic division differs from those of the New Zealand species, and also from those of the *Nesioneta* species.

*Female*: Total length 1.55-1.65. Carapace length 0.6-0.65. Carapace pale yellow to yellow, with faint dusky markings and margins. Abdomen whitish grey to brownish grey, with dorsally a white spot anterior to spinnerets, and occasionally a few white markings anteriorly. Sternum yellow to orange, suffused with grey. Legs pale yellow to yellow-brown. Dorsal tibial spines 2222; metatarsi I-III with a trichobothrium, TmI 0.25. Epigynum (Fig. 28).

*Male*: Total length 1.45-1.55. Carapace length 0.65.

Colour as female. Dorsal tibial spines 2221, not typical of genus; tibia I not swollen. Trichobothria as female. Palp (Figs. 26, 27).

*Records*: CAROLINE ISLANDS: type locality, holotype and 2♂ 7♀ paratypes.

MARSHALL ISLANDS: Majuro Atoll, Uotjaa I., 1♀, 26 July 1968, J. W. Berry.

COOK ISLANDS: Rarotonga I., Arorangi, 1♀, 13 Mar. 1987, J. W. Berry & J. A. Beatty.

*Natural history*: Females were adult in March, April and July, males in April. Habitats were in coconut litter and in grass litter.

***Centromerus truki* Millidge, new species** (Figs. 29-32)

This species is placed provisionally in *Centromerus* Dahl, though it is not entirely typical of that genus. It is possible that the species will require a new genus, but it is best to delay a decision on this until the female is discovered.

*Type*: Male holotype from Caroline Islands, Truk Atoll, Moen I., 12 June 1973 (J. A. Beatty & J. W. Berry); deposited in Bishop Museum, Honolulu.

*Etymology*: The specific name refers to the locality of capture.

*Diagnosis*: The female is not known. The male is diagnosed by the palp (Figs. 29-31), and particularly by the embolic division and the form of the cymbium; the stout cheliceral spur (Fig. 32) is a confirmatory character.

*Male*: Total length 1.6. Carapace length 0.75. Carapace orange, suffused with grey. Eyes fairly large, with posterior eyes less than 1 diameter apart. Chelicerae with large pointed spur anteriorly (Fig. 32). Abdomen pale yellow dorsally and on sides, brownish black ventrally. Sternum orange, suffused with grey. Legs pale yellow, long, with tibia I l/d c. 17. Dorsal tibial spines 2222, no metatarsal spines. Metatarsi I-III with a trichobothrium; TmI c. 0.15. Palp (Figs. 29-31).

*Record*: Only the holotype.

*Natural history*: The single male was adult in June. It was shaken from trees in forest above quarry.

**Genus *Priscipalpus* Millidge, new genus**

*Type species*: *Linyphia palmaria* Marples, 1955.

*Etymology*: From the Latin *priscus*, meaning "ancient, antique", referring to the primitive palpal construction.

*Diagnosis*: The locality of capture (South Pacific Islands) is an important diagnostic character. The female is diagnosed by the epigynum (Figs. 35, 36), which is somewhat variable in appearance, coupled with the chaetotaxy. The male is diagnosed by the palp (Figs. 33, 34), and particularly by the form of the embolic division.

*Description*: The single species has a total length of 1.75-2.1. The carapace of the male has a weak cuticular depression (sulcus) near the margin between the chelicerae and coxa I. The chelicerae have weak lateral striae, and are longer and more divergent in the male. The eyes are moderately large, with the posterior eyes all less than 1 diameter apart. The legs are moderately long and slender, with tibia I l/d 11-12. Metatarsal

spines are absent, and the dorsal spines on tibiae I-IV are 2222, tibiae I-II have one pro- and one retro-lateral spine; femora I-II have 1 dorsal spine, and femora I have also one prolateral spine. Metatarsi I-III have a trichobothrium, and TmI c. 0.25. The female palp is clawless. The tracheal system comprises 4 simple tubes, the lateral ones longest, confined to the abdomen; these tracheae open to the exterior via an atrium. The female epigynum (Fig. 35) has the genital openings in a small pocket near to the posterior. The internal duct system (Fig. 36) appears to be of a somewhat primitive form; the direction of coiling (chirality) of the duct is the same as in the Mynogleninae and *Hormembolus* Millidge (Millidge, 1985: 74, 75), and the reverse of that in the Linyphiinae. The paracymbium of the male palp (Fig. 33) is large, the tegular margin on the ectal side is only lightly sclerotized, and there is no suprategulum. The embolic division (Fig. 34) has a prominent sclerotized apophysis, bifurcated distally, which has a short pointed branch extending to the ectal side of the palp. The fairly stout embolus arises from the anterior of the radical part and curves around in a short spiral. The embolic division is attached to the tegulum by a broad junction near the posterior of the organ, and this junction appears to be more heavily sclerotized on the posterior side.

*Included species:* Only the type species.

*Distribution:* Mariana Islands, Fiji, Samoa and Cook Islands.

*Taxonomic position:* This genus has what are thought to be relatively primitive genitalic characters, the male palpal bulb being basically similar in structure to those of the agelenids *Cicurina* Menge and *Textrix* Sundevall (Millidge, 1988b). The chirality of the sperm duct in the female epigynum indicates a relationship to Mynogleninae and *Hormembolus*, rather than to the Linyphiinae (*s.str.*) or any of the subfamilies of the northern hemisphere.

***Priscipalpus palmarius* (Marples), new combination (Figs. 33-36)**

*Linyphia palmaria* Marples, 1955:492. Male and female syntypes from Western Samoa; not examined.

*Diagnosis:* This, the only species of the genus, is diagnosed by the characters of the genus.

*Description:* The somatic characters of this species have been well described by Marples (1955). The genitalia, however, are re-figured here. Epigynum (Figs. 35, 36). Male palp (Figs. 33, 34).

*Records:* WESTERN SAMOA: The types.

MARIANA ISLANDS: Guam I., 1♀, 4 Mar. 1973, litter in bamboo-*Pandanus* forest along pipeline road, J. A. Beatty.

FIJI ISLANDS: Viti Levu I., Lami Beach, 1♂ 2♀ 1j, 3 May 1987, litter under shrubs; Suva, Samabula, 1♀, 4 May 1987, leaf litter in yard, 2♂ 1♀, 9 May 1987, grass litter; 22.4 km W. of Suva, 2♀, 5 May 1987, grass litter; 1.7 km S. of Naiborebore, 1♀, 8 May 1987, grass litter; Nadarivatu, 2♂ 3♀, 14 May 1987, litter under eucalyptus; Nausori, Koronivia Research Station, 2♂ 4♀, 18 May 1987, litter along drainage ditch, 3♀, 18 May 1987, in cornstalk pile; Nausori, 1♀, 18 May 1987,

shaken from lower banana leaves; Naduri, 1♀ 4j, 21 May 1987, on bank of Sigatoka River; 0.5 km E. of Komave, 1♂, 24 May 1987, in coral rubble on beach, J. W. Berry, J. A. Beatty.

COOK ISLANDS: Rarotonga I., Arorangi, 6♂ 26♀ 4j, 3 Mar. 1987, coconut litter along Ara Metua, 5♂ 5♀, 4 Mar. 1987, in grass and banana litter, 13♂ 14♀, 12 Mar. 1987, coconut litter, 37♂ 47♀ 57j, 13 May 1987, coconut litter, 1♀, 13 Mar. 1987, shaken from tree, 1♂ 2♀ 1j, 14 Mar. 1987, litter on roadside bank; Raemaru, 5♂ 4♀ 6j, 24 Mar. 1987, in litter, elev. 350m; inland from Muri Beach, 2♀ 1j, 4 Mar. 1987, litter along stream, elev. 20m; Ngatangia, 1♀, 16 Mar. 1987, on citrus tree; Turangi Valley, 1♂ 4♀, 18 Mar. 1987, webs in depressions on earth bank, 1♂, 18 Mar. 1987, shaken from tree; Taakoka I., 1♀, 19 Mar. 1987, 2♀, 20 Mar. 1987, in litter; Oneroa I., 2♂ 1♀ 1j, 21 Mar. 1987, beach litter; Muri, 3♂ 7♀ 6j, 24 Mar. 1987, coconut frond litter; Avana Valley, 6♂ 15♀ 2j, webs on rocks at edge of stream, elev. 100m, J. W. & E. R. Berry, J. A. Beatty.

Aitutaki I., Ureia, 1♂ 9♀, 30 Mar. 1987, under fallen coconut fronds on beach, J. A. Beatty, J. W. Berry; Amuri, 2♀, 2 June 1987, in beach rubble; Arutanga, 1♂, 3 June 1987, in coral rubble at pier, J. W. Berry.

*Natural history:* Adult males and females were collected in every month from March through June. Specimens were taken by shaking trees, in webs in depressions in the soil and on rocks along a stream, in beach rubble, and in litter in various situations.

**Introduced species**

***Eperigone fradeorum* (Berland)**

*Parerigone fradeorum* Berland, 1932:76; figs. 3-11 (male holotype from San Miguel, Furnas, Azores, in MNHN, examined by Millidge).

*Aitutakia armata* Marples, 1960:386, fig. 2 (male holotype from Aitutaki, Cook I., in Bishop Museum, Honolulu, examined by Beatty). NEW SYNONYMY.

Although widely distributed and originally described from the Azores Islands, this species is probably native to eastern North America and introduced elsewhere (Millidge, 1987).

*Records:* COOK ISLANDS, Aitutaki I., Ureia, 1♀, under fallen coconut fronds on beach, 30 Mar. 1987, J. W. Berry, J. A. Beatty; Amuri, 2♂ 1♀, in beach rubble, 2 June 1987, J. W. Berry; Rarotonga I., Arorangi, 1♂ 2♀ 1j, shaken from fallen coconut fronds, 12 Mar. 1987, J. W. Berry, J. A. Beatty, 3♂ 4♀ 9j, in pile of coconut fronds, 13 Mar. 1987, J. A. Beatty, J. W. Berry; Ngatangia, 1♀, in beach rubble, 31 Mar. 1987, J. W. Berry; Koromiri I., 1♀, in beach rubble, 3 Apr. 1987, J. W. & E. R. Berry.

***Erigone prominens* Bösenberg & Strand**

This species, originally described from Japan, is known also from New Zealand. We have taken it in several Pacific Island groups.

*Records:* CAROLINE ISLANDS, Truk Atoll, Moen I., 1♂, in web just above ground in marshy field, 12 June 1973, J. W. Berry, J. A. Beatty.

MARSHALL ISLANDS, Majuro Atoll, Arniel I.,



1♀ in grassy meadow, 30 July 1969, J. W. Berry.

FIJI ISLANDS, Viti Levu I., Nadi Bay, 1♀, in beach rubble, 28 Apr. 1987, J. W. & E. R. Berry, 1♀, under rocks near shore, 12 May 1987, J. W. Berry; 1.7 km S. of Naiborebore, 1♀, in grass litter, 8 May 1987, J. W. Berry; Deuba, 1♂ 3♀, in *Scaevola* litter, J. A. Beatty, J. W. Berry; Nadarivatu, 1♂, in litter under eucalyptus, 14 May 1987, J. W. Berry; 0.5 km E. of Komave, 1♂ 1♀, in coral rubble on beach, 24 May 1987, J. W. Berry.

COOK ISLANDS, Aitutaki I., Amuri, 1♂ 1♀, in beach rubble, 2 June 1987, J. W. Berry; Rarotonga I., Arorangi, 1♀, in grass litter, 4 Mar. 1987, J. W. & E. R. Berry; Oneroa I., 2♂ 2♀, in beach litter, 21 Mar. 1987, J. W. & E. R. Berry; Koromiri I., 1♀, in coral rubble, 6 Apr. 1987, J. W. & E. R. Berry.

#### *Ostearius melanopygius* (O.P.-Cambridge)

The origin of this widely distributed species is unknown, but it may have been either South America or New Zealand (Millidge, 1988a).

*Record:* HAWAIIAN ISLANDS, Kauai I., Kokee State Park, elev. c. 1200m, 1♂, 17 May 1985, Michael Doyle.

#### *Tennesseellum formicum* (Emerton)

This eastern North American species has not previously been found in the Pacific area.

*Records:* MARSHALL ISLANDS, Kwajalein Atoll, Ennylebegan I., 1♂, litter in grassy area, 25 July 1969, J. W. Berry; Roi-Namur I., 8♀ 6j, in clumps of grass, 27 July 1969, J. W. Berry.

#### Discussion

Of the 36 Micronesian and Polynesian linyphiid species currently known, at least 9 are presumed introduced, largely from North America. These include 1 species of *Colonus*, 3 of *Eperigone*, 3 of *Erigone*, *Prinerigone vagans* (Audouin) and *Tennesseellum formicum*. Two unidentified *Meioneta* species reported from Hawaii may be either introductions or native species which perhaps belong to genera similar to *Meioneta* known from other parts of the Pacific.

Nineteen of the remaining species are known from a single island or island group each. They have not been revised since their original description and may not belong to the genera that now include them. The ranges of the new species described above include 3 species from the Caroline Islands and five known from 2-5 island groups each. We have found no more than six species per island. Some species are apparently endemic to specific island groups; others are not.

The number of species of linyphiids does not appear to show the "filter-bridge" effect shown by many other groups of organisms in the Pacific. There are nearly as many species in the easternmost islands as in the westernmost islands on which we have collected. Perhaps this is because the linyphiids are not especially abundant anywhere in the tropics, or because a richer fauna, further to the west, remains undiscovered.

Despite two summers of intensive collecting, we

found no linyphiids at all at Eniwetok Atoll (Marshall Islands). This atoll is much drier (about 1.25m of rainfall per year) than its neighbouring atolls (Kwajalein and Majuro, 2.5m and 3.7m rainfall per year, respectively). Nuclear bombs were tested on some islands of the Eniwetok Atoll following World War II, but there is no evidence that the absence of linyphiids is related to the testing. It is likely that the various Marshall Islands would have similar faunas if they received the same amount of rainfall.

As expected, the linyphiids constitute a much smaller proportion of the spider fauna in the Pacific than in north temperate areas. We estimate that about 4% of the Pacific spider species are linyphiids, as against 26% in southern New England (Kaston, 1981). They are largely replaced by other small litter-inhabiting families such as oonopids, tetrablemmids and ochyroceratids, which together make up an estimated 10% of the Pacific spider species. Individuals of the linyphiid species are, however, sometimes abundant. We took 141 *Priscipalpus palmarius* from a small pile of dead coconut fronds on Rarotonga in about an hour.

Habitats in which linyphiids occur in the tropical Pacific are much as they are in the rest of the world. *Erigone* is often found near water, *Tennesseellum* in litter in open, non-forested areas, and so on. In very wet places, such as eastern Viti Levu (Fiji), we found virtually nothing in forest litter. Apparently the litter is so wet that small spiders would be trapped in water films. In such places all the small spiders tend to be above the ground at varying heights, rather than in the litter. Only in more open or well-drained places in Fiji did we take the small species in the expected situations.

At this point we still cannot see any distinctive pattern of species distribution throughout the Pacific Basin. Our previous work on *Paratheuma* (Desidae) (Beatty & Berry 1988a,b; Berry & Beatty, 1989) suggests chance colonization by an ancestral species of different island groups, with subsequent evolution of new species in those groups.

#### Acknowledgements

We wish to thank Butler University for Academic Grants which helped support the field work and preparation of this manuscript, and the U.S. Department of Energy for travel funds for the work in the Marshall Islands.

Elizabeth Berry's contributions to all phases of the study in the Pacific and at home have been invaluable. We are grateful to the staff of the Bishop Museum, Honolulu for assistance in various ways. We also wish to thank the staff of the Richard Gump Laboratory, Moorea, Society Islands; Drs Kamlesh Kumar and Madhu Kamath and Mr Satya Ram Singh at the Koronivia Research Station in Fiji (Dr Kamath is now at the Forestry Station, Colo-i-Suva); Rajendra Nath, Sharkat Ali and Mohammed Azim at the Lega Lega Research Station, Nadi, Fiji; Ozanne Rohi in Hiva Oa (Marquesas Islands), Rick and Gwyn Welland in Rarotonga (Cook Islands), and Josie and David Sadaraka, Aitutaki (Cook Islands). Without their co-

operation our field work would have been much less pleasant and effective.

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**Appendix 1:** Micronesian and Polynesian linyphiids, with known distributions (excluding new species described herein).

*Bathyphantes paradoxus* Berland – Samoa; *Cnephalocotes simpliciceps* Simon – Hawaii; *Colonus* sp. – Midway I.; *Eperigone fradeorum* (Berland) – USA, Azores I., South Africa, New Zealand, Cook I.; *E. tridentata* (Emerton) – USA, Hawaii, New Zealand; *E. sp.* – Hawaii; *Erigone autumnalis* Emerton – USA, Hawaii; *E. dentosa* O. P.-Cambridge – USA, Mexico, Guatemala, Hawaii; *E. prominens* Bös. & Strand – Japan, Marshall I., Fiji, New Zealand, Cook I., Caroline I.; *E. stygia* Gertsch – Hawaii; *Ischnyphantes pacificanus* Berland – Marquesas I.; *Labulla graphica* Simon – Hawaii; *L. torosa* Simon – Hawaii; *Lepthyphantes lebronneci* Berland – Marquesas I.; *Linyphia tuasivia* Marples – Samoa, Cook I.; *Meioneta gagnei* Gertsch – Hawaii; *Meioneta* spp. – two species from Hawaii; *Microneta insulana* Simon – Hawaii; *Ostearius melanopygius* (O.P.-Cambridge) – St. Paul I., Austral I., Hawaii, New Zealand, Europe, USA; *Paro simoni* Berland – Rapa I.; *Priperia bicolor* Simon – Hawaii; *Prinerigone vagans* (Audouin) – Hawaii, Singapore, Africa, Madeira I., Azores I.; *Priscipalpus palmarius* (Marples) – Guam, Samoa, Fiji, Cook I.; *Tennesseellum formicum* (Emerton) – USA, Marshall I.; *Uahuka affinis* Berland – Marquesas I.; *U. spinifrons* Berland – Marquesas I.; *Uapou maculata* Berland – Marquesas I.

Bull.Br.arachnol.Soc. (1991) 8 (9), 274-276

## Parthenogenesis in the scorpion *Tityus columbianus* (Thorell) (Scorpiones: Buthidae)

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## Summary

Parthenogenesis is confirmed in the scorpion *Tityus columbianus* (Thorell) from Colombia in at least one of the three known populations in that country. The region of Mosquera where this population lives is a dry and arid zone dominated by Cactaceae. This stressed environment seems to agree with the rule of geographical parthenogenesis in animals (Cuellar, 1977), i.e., that parthenogenesis predominates throughout the world in disclimax situations.

## Introduction

Parthenogenesis was first observed among scorpions in *Tityus serrulatus* Lutz & Mello from Brazil (Matthiesen, 1962). Later, the existence of other parthenogenetic scorpions was observed or suggested by studies of other *Tityus* species such as *T. uruguayensis* Borelli (Zolessi, 1985), *T. trivittatus* Kraepelin (Maury, 1970) and *T. inexpectatus* Moreno (Armas, 1980).

More recently Makioka & Koike (1984, 1985), have drawn attention to the existence of parthenogenetic populations in *Liocheles australasiae* (Fabricius) (Ischnuridae). In every case of parthenogenesis reported so far, the scorpions reproduced by thelytokous parthenogenesis.

The original description of *Tityus columbianus* (Thorell) was based on a single adult female. In my recent study of the *Tityus clathratus* group (Lourenço,