Theridion pumilio (Theridiidae) and *Drapetisca australis* (Linyphiidae) are transferred to *Diploplecta* Millidge, 1988 (Araneae: Linyphiidae, Linyphiinae)

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An examination of the type specimens of *Theridion pumilio* Urquhart, 1886 (Theridiidae) and the description of *Drapetisca australis* Forster, 1955 (Linyphiidae) showed that, on the basis of epigynal characters, the two species should be transferred to *Diploplecta* Millidge, 1988.

Keywords: aerial dispersal, Antipodes Islands, Linyphiidae, money spiders, New Zealand.

Introduction

Diploplecta is a genus of small linyphiid spiders established by Millidge (1988). He described seven species, all of them new and endemic to the New Zealand region. As he noted, "taxonomically this genus is a difficult one"; the males are impossible to identify to species in most cases, and "diagnosis of the females is also far from simple". He could diagnose them "with certainty only by examination of the internal genitalia, which necessitates excision of the epigynum followed by clearing …. This procedure, with these tiny epigyna, is laborious and time-consuming, but at the present time there is, in most cases, no alternative". He also admitted "the genus needs more study" and "might lead to the elimination of some of the species described … or, alternatively might result in the recognition of additional species" (Millidge 1988: 48–51).

We have found that two species, placed by earlier workers in other genera by default, belong in *Diploplecta*. They are *Theridion pumilio* Urquhart, 1886, from Karaka, near Auckland, and *Drapetisca australis* Forster, 1955, from the Antipodes Islands. Here we transfer them to *Diploplecta* and discuss the implications of these decisions.

Taxonomy

Diploplecta Millidge, 1988

Type species *Diploplecta communis* Millidge, 1988.

Holotype female, "Hawkes Bay, Waitetola. 8–11.v.67", collector R W Hutton, Otago Museum (not examined).

The locality name, "Waitetola", is a misspelling of Waitetoko, near Lake Taupo, and the collection label has the date 8–11 May 1968 (Vink et al. 2011).

Diagnosis: All the species have the same basic colour pattern (Fig. 1). The carapace has a black longitudinal median stripe and black margins and the abdomen a black median dorsal stripe, often broken into a series of spots. The sides are mottled black.

The form of the epigynum is diagnostic (Millidge 1988: 45, fig. 215 (type)) (Fig. 2A). "There is a well-defined atrium … enclosed between the ventral and dorsal plates; the dorsal plate is extended posteriorly as a narrow scape which carries a minute socket distally, and there is in most species a short pseudoscape … which projects from the ventral plate over the entrance to the atrium".

One species, *Diploplecta nuda* Millidge, 1988, lacks the pseudoscape but is based on just one

Figure 1. Dorsal view of a male specimen of *Diploplecta* sp. showing characteristic dorsal stripe. (Te Paki, Spirits Bay, Northland, New Zealand, ex pit trap, O J-P Ball, Oct–Nov 2006. Museum of New Zealand Te Papa Tongarewa, AS.4743)

specimen and Millidge suggested that it could be an "abnormal example of *D. duplex*" (Millidge 1988: 56). On the male palp the paracymbium has a narrow basal arm and a broad distal arm, the suprategulum has a long apophysis, and the embolic plate has three sclerites and a slender, curved embolus (Millidge 1988: 45 & 48, figs 221–223).

***Diploplecta pumilio* (Urquhart, 1886) new combination**

Theridion pumilio Urquhart 1886: 190–192, pl. 7, figs 3 a–f. – Bryant 1935, 55; Paquin, Vink & Dupérré, 2010: 62.

Type material: Te Karaka, Auckland, collector A T Urquhart, Canterbury Museum (2005.135.547–2005.135.549, 3 female syntypes present, male and female types missing). (Te Karaka is now known as Karaka) (examined).

Comments: Urquhart gave his collection of spiders to Canterbury Museum in 1899. Soon afterwards Professor F W Hutton prepared a hand-written "List of Types in the Canterbury Museum" (Canterbury Museum 2010.160.267). The list of arachnid types, although incomplete, included some of Urquhart's types, among them *Theridion pumilio*. However, when Bryant (1933) examined and re-described what were considered to be all of Urquhart's types (52 species), *T. pumilio* was not among them. Subsequently, Bryant (1935) examined additional Urquhart specimens, identifiable from his writing on the labels. They included *T. pumilio* but Bryant noted only that "all the specimens are female" and gave no indication of their type status (Bryant 1935: 55). Later, when Nicholls et al. (2000) compiled a list of the arachnid types held in Canterbury Museum, they recorded four female syntypes of *T. pumilio*. We have examined the specimens of *T. pumilio* in the Canterbury Museum collection. There is just one vial, containing three females, with a label in Urquhart's handwriting stating on one side "Theridium pumilio" (torn in two at the "l") and on the other "Vol. XVIII – 190". These are almost certainly the specimens seen by Bryant (1935) and Nicholls et al. (2000). One female consists of a cephalothorax with abdomen attached and the scape visible. There are also two cephalothoraxes without abdomens, plus fragmentary material but no epigyna amongst it. The poor, fragmented condition of the material may account for the different totals given by Nicholls and by us.

We take at face value that the specimens we examined are part of the type series. The label in Urquhart's own hand linking the vial to the description indicates that it includes type material. However, the only measurement given by Urquhart was the total length, and for this reason, combined with the uncertainty about the true number of syntypes we will not designate a lectotype.

Description: Urquhart (1886: plate 7, fig. 3e) illustrated the epigynum of *Theridion pumilio* (reproduced here, Fig. 2B). He clearly shows the atrium, with the dorsal plate having a narrow scape projecting posteriorly, and the margin of the ventral plate having a short pseudoscape, which are diagnostic features for *Diploplecta*. In concert with our examination of Urquhart's material, this is our reason for transferring this species to *Diploplecta*. We did not illustrate

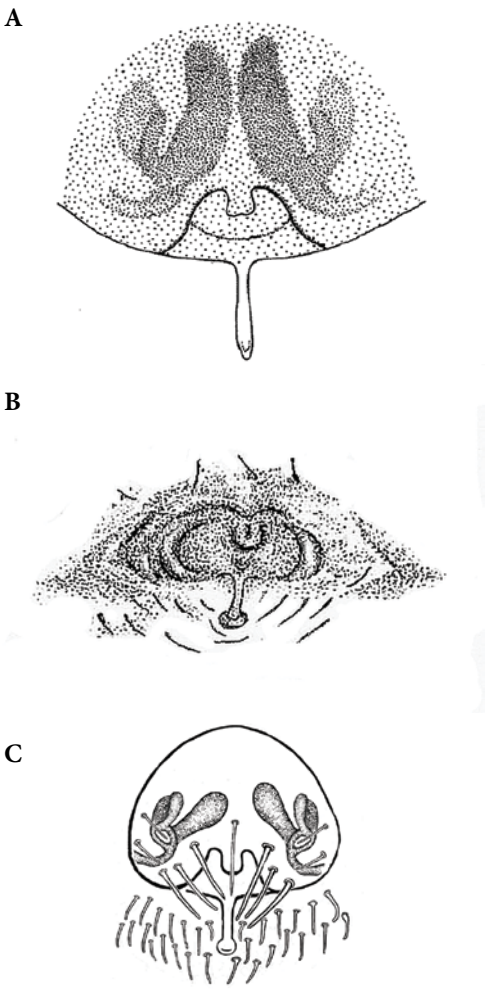

Figure 2. Epigyna of the three species of *Diploplecta* treated here. **A**, epigynum of *Diploplecta communis* (reproduced from Millidge 1988: fig. 215, with permission of Otago Museum). **B**, epigynum of *Theridion pumilio* (reproduced from Urquhart 1886: plate 7, fig. 3e, with permission of the Royal Society of New Zealand). **C**, epigynum of *Drapetisca australis* (reproduced from Forster 1955: fig. 44)

Urquhart's specimen as although it was sufficiently well-preserved for us to consider it a reliable match for Urquhart's figure, it had degraded over the last 134 years. Any new illustration would not have been as clear as Urquhart's depiction, which was drawn when the specimen was fresh. Although the only measurements Urquhart gave were the total length of an adult female (1.75–2 mm) and of an adult male (1.5 mm), these are within the range of 1.5–2.0 mm given for the genus by Millidge (1988), as is the only specimen still measurable. Millidge did not give the sequence for leg length but Urquhart gave the sequence of 1, 2, 4, 3 for *Theridion pumilio*. No male examples were available to examine in Urquhart's material and for this reason we have emphasised female genitalic characters. However, Urquhart did provide a figure of the male palp (Urquhart 1886: plate 7, fig 3c) and this bears a general similarity of form to the palp of *Diploplecta communis* illustrated by Millidge (1988: fig. 221) and very little resemblance to the palp of *Theridion pictum* (Walckenaer, 1802), the type species for that genus (e.g. Almquist 2005: figs 124 a–c).

***Diploplecta australis* (Forster, 1955) new combination**

Drapetisca australis Forster 1955: 193–195, figs 40–44. – Paquin, Vink & Dupérré, 2010: 56.

Type material: Holotype female, Top of slope above Ringdove Bay, Antipodes Islands, ex mould under *Poa literosa* with *Polystichum vestitum*, 10 November 1950, E G Turbott, Auckland Museum (not examined).

Comments: Forster (1955) described *Drapetisca australis* from just one female specimen and placed it in the genus *Drapetisca*, with some reservations, "until more adequate material is available". *Drapetisca* and *Diploplecta* are both in the Linyphiinae and Forster was probably influenced by Hickman's (1939) description of *Drapetisca antarctica* from the Crozet Islands (note: Forster stated, in error, that *D. antarctica* was from Macquarie Island and that Hickman's paper was published in 1941). Hickman (1939) described *Drapetisca antarctica* from an immature female. Later, Tambs-Lyche (1954) found an adult female of *D. antarctica* in a collection of dried spiders from the Crozet Islands Whaling Expedition of 1907–1908. He realised that these specimens did not belong in *Drapetisca*, so established the genus *Ringina*

for Hickman's species and described his own as *Ringina crozetensis*. Subsequently, Ledoux (1991) recognised *Ringina crozetensis* as a junior synonym of *Ringina antarctica*. With these changes, *Drapetisca australis* became the sole southern hemisphere representative of the genus.

Forster (1955) described *Drapetisca australis* from just one female. However, his figure of the epigynum shows clearly the atrium, pseudoscape and scape that are diagnostic for *Diploplecta* (Fig. 2C) and we hereby transfer this species to that genus. Also, the colour pattern (carapace pale yellow with blackish median band and lateral margins and the abdomen cream with a thin black antero-median line) is consistent with that for the genus.

When Millidge (1988) created the genus *Diploplecta* he described seven species, including *Diploplecta proxima* Millidge, 1988 from the Antipodes Islands, Snares Islands and the South Island of New Zealand. He overlooked Forster's description of *Drapetisca australis* whereas Marris (2000), in his checklist of arachnids and insects of the Antipodes Islands, included *Drapetisca australis*, but not *Diploplecta proxima*. Measurements for *Drapetisca australis* (female, carapace 1.29 mm, abdomen 1.53 mm, = total length 2.82 mm) given by Forster (1955) are substantially greater than those for *Diploplecta proxima* (female, carapace 0.8 mm, total length 1.7–1.8 mm) (Millidge 1988). Forster (1955) gave the measurements of the legs and the sequence, 1, 2, 4, 3 is the same as given by Urquhart for *Theridion pumilio*.

It seems unlikely that an island of just 2,025 ha, covered mainly in tussock grassland, would have two species of *Diploplecta*. Despite the apparent size difference, it is possible that *Diploplecta proxima* may prove to be identical with *Diploplecta australis* so we leave the two species as current species until a full revision of the genus can be done.

Natural history of *Diploplecta*

Many linyphiids, commonly known as money spiders, are aerial dispersers, and *Diploplecta* is amongst them. Suction traps operated by Laura Fagan at Pukekohe, Auckland, to measure aerial dispersal of insects and spiders, caught substantial numbers of adult *Diploplecta* (C J Vink, pers. comm.).

Urquhart gave a brief account of seasonality, habitat and web structure of *Theridion pumilio*. "Mature examples, especially females, may generally be taken throughout the winter months. Until winter rains set in, these little spiders are often numerous about pastures and amongst low native vegetation in damp spots. They spin a fine horizontal web, with a small triangular mesh; one portion is drawn up to a stem or blade, beneath which the spider rests" (Urquhart 1886: 192). The type of *D. australis* was collected from "mould under *Poa literosa* with *Polystichum vestitum*" (Forster 1955) and of *D. proxima* "in litter of *Poa foliosa*" (Millidge 1988). Also, many of the specimens of the various species of *Diploplecta* examined by Millidge (1988) were collected from moss, lichen, and grasses.

Conclusion

With the transfer of *Drapetisca australis* to *Diploplecta*, the genus *Drapetisca* contains just four species, all in the Northern Hemisphere; *Drapetisca alteranda* Chamberlin, 1909 (Canada and northern USA), *Drapetisca bicruris* Tu & Li, 2006 (China), *Drapetisca socialis* (Sundervall, 1833) [type species] (Britain and northern Europe), and *Drapetisca oteroana* Gertsch, 1951 (New Mexico) (World Spider Catalog 2019).

The transfer of *Theridion pumilio* and *Drapetisca australis* to *Diploplecta* increases the number of species of *Diploplecta* from seven to nine. However, the number of species could be further revised in future if molecular analysis of substantial collections of specimens from throughout the New Zealand region is undertaken.

Acknowledgements

We thank Cor Vink, Canterbury Museum for the loan of Urquhart specimens and the record of aerial dispersal and John Marris for checking for *D. australis* in the Lincoln Collection. We gratefully acknowledge Melanie Lovell-Smith of the National Library for providing a high-quality scan of Urquhart's figure for *T. pumilio* from the Transactions series and Kane Fleury for arranging permission from Otago Museum to reproduce the figure for *D. communis*. Lastly, we thank Stephen Thorpe for his iNaturalist NZ observations of *Drapetisca australis* that sparked our interest in this study. We also thank Nadine Dupérré and Victoria Smith for their constructive comments on the manuscript.

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