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Review of the genus *Ommatoiulus* in Andalusia, Spain (Diplopoda: Julida) with description of ten new species and notes on a remarkable gonopod structure, the fovea

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Abstract

A comprehensive revision of the species of the genus *Ommatoiulus* in Andalusia, southern Spain, is carried out for the first time, revealing the presence of a total of 19 species, among which are one new record for the country, one for continental Spain, two new records for Andalusia and 10 species new to science: *Ommatoiulus baenai*, *O. baileyi*, *O. hoffmani*, *O. jaenensis*, *O. kimei*, *O. pseudoflagellatus*, *O. recueroi*, *O. reipi*, *O. sabinarensis*, *O. schubarti* **n.spp.** The following taxa are synonymised: *Schizophyllum hoplites* Verhoeff, 1910, *S. diplurum appendiculatum* Brolemann, 1925, and *Ommatoiulus diplurus mauriesi* Hoffman, 1975, are regarded as junior synonyms of *Ommatoiulus diplurus* (Attems, 1903), **n.syn.** *Schizophyllum dorsovittatum estrellanum* Verhoeff, 1910, and *S. calatravanum* Brolemann, 1920, are junior synonyms of *Ommatoiulus dorsovittatus* (Verhoeff, 1893), **n.syn.** *Schizophyllum nivale* Schubart, 1959, is a junior synonym of *Ommatoiulus ilicis* (Brölemann, 1896), **n.syn.** Full descriptions and diagnostic notes are provided for all the species with accounts on their distributions, habitats, and notes discussing their taxonomy. A dichotomous identification key, based on gonopod structures, is presented to facilitate species identification. In the discussion section, the general patterns of species distribution are underlined, showing a clear tendency to ‘endemism’ for the majority of species and to polymorphism for species with broader distribution ranges, especially *O. diplurus*. A disjunct distribution Andalusia/Pyrenees is registered for *O. ilicis*. A comprehensive comparison of gonopods is attempted, and three main types of gonopod configuration are delimited, denoting a wide range of structural complexity. The fovea, a cavity in the posterior gonopods, is explored for the first time with scanning electron microscopy, revealing an agglutination of spermatozoa and confirming Verhoeff’s original observation dating back nearly 120 years. The constancy of the fovea in all Schizophyllini, combined with its absence in the rest of the julids, provides an additional apomorphy for the tribe.

Key words: Taxonomy, Spain, identification key, species variation, new synonymies, distribution, SEM, gonopods, fovea

Introduction

Schizophyllini is a tribe of julid millipedes comprising ca. 60 described species with the vast majority occurring in the Iberian Peninsula and North Africa. A few species are widely distributed, such as *Ommatoiulus sabulosus* (Linnaeus, 1758), which reaches 64°N in Fennoscandia and *O. moreleti* (Lucas, 1860) which has acquired a near-cosmopolitan, synanthropic distribution. Most species of Schizophyllini are currently classified in the genus *Ommatoiulus* Latzel, 1884, the rest in a few ‘satellite’ (sub)genera viz., *Rossiulus* Attems, 1926 (E Europe to Iran) and *Tachypodoiulus* Verhoeff, 1893 (W Europe). The monophyly of the Schizophyllini has long been established on the basis of a synapomorphic character consisting in the presence of a leaf-like accessory claw in juvenile stadia (Verhoeff 1926-32, Read 1990) and recently based on molecular data (Enghoff et al. 2011). Only the genus *Tachypodoiulus* was a subject of hesitation due to its very simple gonopods compared to *Ommatoiulus*: it was considered close to the latter by Verhoeff (1910), then placed in *Cylindroiulini* by Hoffman (1980) before being restored to Schizophyllini by Read (1990), based on the cited synapomorphy plus some other characters, such as