



Revision of the *Megaphyllum projectum* Verhoeff species complex (Myriapoda: Diplopoda: Julida: Julidae)

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Abstract

On the basis of male and female genitalia and nonsexual morphology, the revision of *Megaphyllum projectum* Verhoeff, 1894 and of its five nominal subspecies (*M. p. projectum* Verhoeff, 1894, *M. p. alticolum* Verhoeff, 1897, *M. p. deubeli* Verhoeff, 1899, *M. p. kochi* Verhoeff, 1907, *M. p. dioritanum* Verhoeff, 1907) has been carried out. The forms *deubeli* and *kochi* proved to be valid subspecies, while the other two forms are synonymised with the nominotypical subspecies, *M. p. projectum*. The differences in the male gonopod of *M. p. dioritanum* from the nominotypical subspecies *projectum* are only due to its positioning under the microscope, while *M. p. alticolum* showed also only minor differences from *projectum*, so it cannot be considered as separate subspecies. Female genitalia also seem to support the existence of the three subspecies. A short key for the subspecies is included.

Key words: millipedes, redescription, diagnoses, synonymies, gonopod morphology, vulval differences

Introduction

The genus *Megaphyllum* Verhoeff, 1894 was described with the type species *Megaphyllum projectum* Verhoeff, 1894, on the basis of males, from leaf litter in a deciduous forest, near Graz, Austria (see pp. 323–324 in Verhoeff 1894a).

In 1896a Verhoeff changed the status of *projectum*, and cited it as *Brachyiulus austriacus* Latz. *projectus* (the change of the generic name is a different matter, see next paragraph), on the basis of the shape of the promeres. Since the opisthomeres of *B. austriacus* and *B. projectus* are quite different, we can clearly see that in Latzel's book the figures of *Iulus austriacus* (see pp. 296–300 and Figs. 157–159 on Table XIII. in Latzel 1884) actually show the male gonopods of *B. projectus* which had not yet been described at that time. His subsequent figures on the same plate (see Figs. 160–161 on Table XIII. in Latzel 1884), marked as *I. unilineatus* (C. L. Koch, 1838), show, however, actually the gonopods of *I. austriacus*. In our opinion, this confusion could have led Verhoeff to change the status of *projectum*. Nevertheless, in 1897 Verhoeff found many *B. projectus* individuals *in copula*, so he could clarify the species' status. Based on the morphology of the male gonopods and other differences in both genders he clearly separated *B. austriacus* and *B. projectus* (Verhoeff 1897a). In the same year he described *B. projectus* var. *alticolum* as a small-sized form living at high elevation above timberline, from Cindrel (=Cândrel or Cibin Mts.) and Bucsecs (=Bucegi Mts.), Romania (see p. 112 and Fig. III in Verhoeff 1897b). It differed from the nominotypical subspecies only by smaller body and gonopod size and darker colouration whilst the gonopod structure looked the same. Interestingly, the gonopod illustration of *B. p. var. alticolum* was also Verhoeff's first illustration of *B. projectus* as a species. The next form, *B. (Chromatoiulus) projectus deubeli* was described from Kuhhorn (= Ineu Peak, Rodnei Mts.), Romania (see pp. 192–193 and Figs. 24–25 in Verhoeff 1899). Verhoeff cited it as a typical example for subspecies in contrast to variants. By 1907 Verhoeff had met so many *B. projectus* individuals from Central Europe that he attempted a revision (Verhoeff 1907), and compiled an identification key for the widespread group, with all its subspecies, on the basis of male gonopods, with additional notes on body size,