CHAPTER 13

DIPLOPODA — GEOGRAPHICAL DISTRIBUTION

BY

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Millipedes occur on all continents except Antarctica. Their known distribution was mapped in great detail by Shelley & Golovatch (2011) who painstakingly accumulated information on the distribution of higher taxa of millipedes, down to the level of order, and presented their findings on numerous maps. They further presented detailed accounts of distribution patterns and used these, together with extensive paleogeographic material, and taking known millipede fossils into consideration, to construct hypotheses about origin and dispersal of higher millipede taxa.

The present treatment provides a brief account of regional millipede faunas and gives examples of distribution patterns at lower taxonomic levels, including the radiations of certain millipede genera on oceanic islands.

MILLIPEDES AS PROVIDERS OF BIOGEOGRAPHICAL EVIDENCE

Most species of millipedes have very small distribution areas, i.e., the level of endemcity is high. An example from the millipede fauna of Europa, incontestably the best studied major part of the World, is provided by volume 1 of the atlas of European species (Kime & Enghoff, 2011). The atlas covers all orders except Julida and Chordeumatida and includes 492 species — roughly a third of the known European fauna. Of these, 183 are known from only one $50 \times 50$ km square, and 252 — more than half — are known from only 1-3 adjacent $50 \times 50$ km squares.

Limited distribution — endemcity — also obtains at higher taxonomic levels. For example, 10 out of the 15 families of the order Julida recognised by Enghoff (1991, 1993) are known only from western North America, eastern North America, Europe (including Macaronesia, North Africa and the Middle East), or eastern Asia. Even the largest julidan family, Julidae, is limited to temperate Eurasia (the Palaeartic region).

Millipede endemism is particularly rampant in mountains and on oceanic islands. A mountain example is provided by the endemic Afrotopical family Oxydesmidae, of
which 21 out of the 27 species described from the Tanzanian Eastern Arc mountains are endemic to just one mountain massif (Hoffman, 1990, 1993, Table 6.1). A study of one genus (*Chaleponcus*) of another endemic Afrotropical family (Odontopygidae) in the Udzungwa Mountains of Tanzania (Enghoff, 2014) has produced 21 species, all endemic to the Udzungwas. Island faunas are treated below.

**REGIONAL MILLIPEDE FAUNAS**

The following summary of major millipede faunas is by no means complete. Emphasis is on larger groups of mainly larger forms. For example, several families of small Polydesmida (e.g., Fuhrmannodesmidae and Pyrgodesmidae) are very richly represented in all tropical regions.

**Holarctic (Palaearctic plus Nearctic)**

The Holarctic region is home to three endemic orders: Glomerida, Callipodida and Julida. All three, however, occur marginally in the Oriental region. The large family Julidae is endemic in the Palaearctic region where Glomeridae, Polydesmidae and numerous families of Chordeumatida are also dominant. The Parajulidae are endemic in the Nearctic subregion where Xystodesmidae (shared with the Palaearctic) are also abundant, and Spirobolidae — although with few species, and also shared with the (eastern) Palaearctic — constitute a further conspicuous element.

**Afrotropical**

Three large families are endemic to sub-Saharan Africa (excl. Madagascar): Oxydesmidae, Gomphodesmidae and Odontopygidae. Other dominant families are Paradoxosomatidae, Chelodesmidae, Pachybolidae and Spirostreptidae, the two latter families in part represented by giant species. Giant pill millipedes occur in southern Africa (Sphaerotheriidae) and Madagascar (Arthrosphaeridae). The S Gondwanan family Dalodesmidae is quite diverse in southern Africa incl. Madagascar. Madagascar further harbours species of the Holarctic + S Gondwanan order Chordeumatida.

**Oriental**

The large cosmopolitan family Paradoxosomatidae is incredibly diverse in the Oriental region. Harpagophoridae (shared with southern Africa and in part represented by giants) are also abundant. Of giant pill millipedes, Zephroniidae are endemic in SE Asia, and Arthrosphaeridae are shared between India and Madagascar. Rhinocricidae occur marginally in the southern Oriental region, as well as the transitional ‘Wallacea’ and the northern and eastern parts of the Australian region (plus the Neotropics).