

Abstract

Investigating the Diversity of the Terrestrial Invertebrate Fauna of Antarctica: A Closer Look at the *Stereotydeus* (Acari: Prostigmata) Genus [†]

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Abstract: The extremely inhospitable Antarctic ecosystems confine plants and invertebrates to sparse ice-free areas. These species survived for millions of years in isolated refugia where population divergence and differentiation can occur, potentially resulting in speciation. The limited dispersal abilities of invertebrate species combined with their specific habitat requirements and the substantial geographical barriers can drastically reduce the gene flow between different populations, resulting in high genetic differentiation between clusters of individuals. With more than 100 described species, mites are surely the most diverse invertebrate group of Continental Antarctica. Among them, the free-living genus *Stereotydeus* Berlese, 1901 (Acari: Prostigmata) is represented by 6 Antarctic species of which 5 occur along the coastal zones of Victoria Land and the Transantarctic Mountains. In order to examine the biodiversity and the phylogeographic distribution ranges of *Stereotydeus* spp. across Victoria Land, we conducted an integrated analysis of the genus through morphological, phylogenetic and population genetics studies. Specimens were collected from nine localities in Victoria Land and sequenced for the cytochrome *c* oxidase subunit *I* mitochondrial gene (COI) and a fragment of the 28S ribosomal RNA-encoding gene using mite specific primers. We morphologically identified and described two novel *Stereotydeus* species from central and south Victoria Land. While the relationships between the *cox1* haplotypes from North Victoria Land are well defined, the distribution of the central-southern species appears more complex. This suggests a possible common evolutionary history in a number of isolated glacial refugia, with scarce gene flow even within populations probably resulting from inter/intra-specific events influenced by several abiotic/biotic factors. Recent threats to Antarctic biodiversity like accelerated climate change, pollution, biological invasions and the increase of human activities have caused increased calls for adequate conservation measures. Establishing a new distribution map for the *Stereotydeus* species of Victoria Land may help lay the foundations for future decisions in matters of protection and conservation of the unique terrestrial fauna of Antarctica.

Keywords: Victoria Land; molecular phylogeny; biogeography; terrestrial invertebrates; Acari; *Stereotydeus* spp