



## The mesostigmatid mite (Acari: Parasitiformes) fauna of Svalbard: a revised inventory of a high Arctic archipelago

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### Abstract

The need for comprehensive studies of the invertebrate fauna in the high Arctic is increasingly acknowledged in order to more fully understand ecosystem functioning, resilience and to project future changes in the biodiversity and species ranges. Information on the mesostigmatid fauna in the high Arctic is scarce and scattered. Large regions of the high Arctic archipelago of Svalbard, including most of the areas in the east of the island group, have never been surveyed for the mesostigmatid fauna. Furthermore, most of the current knowledge on the mesostigmatid fauna of this important region in the European high Arctic originates from studies in the early 20<sup>th</sup> century. Much of the associated slide material no longer exists, either being mislaid or deliberately destroyed, resulting in an ambiguous and potentially misleading mesostigmatid fauna checklist in which identifications and potential synonyms cannot be reliably assessed. Determination of fresh material sampled between 2007–2010 may be an ideal procedure to resolve the great number of uncertainties about the mesostigmatid fauna of the Svalbard archipelago. Twelve out of the 27 species recorded from the Svalbard archipelago were found in the new samples collected from a large number of localities and microhabitats. No new species were identified in the current campaign, and most of the non-observed species are considered to be past misidentifications or potential synonyms. Combining this study with recent publications provides a total mesostigmatid mite diversity for Svalbard of 22 species. This represents the most accurate checklist of the mesostigmatid mite fauna of the archipelago to date.

**Key words:** Gamasida, invertebrate, polar, high latitude, diversity

### Introduction

Recent investigations on the biodiversity and species distribution in the Svalbard archipelago have highlighted the need for comprehensive studies on the invertebrate fauna, since the number of species recorded continues to increase steeply (Coulson, 2007; Ávila-Jiménez *et al.*, 2008; Gwiazdowicz *et al.*, 2009). Information regarding the mesostigmatid fauna in particular is scarce and scattered, and large regions of the Svalbard archipelago have never been surveyed for microarthropods. The Mesostigmata is a large group with species distributed worldwide and composed mainly of predatory mites, often occupying the top position in the soil microarthropod food web (Karg, 1993; Krantz & Walter, 2009). In spite of their importance in soil ecosystems, little is known about the group in the Arctic region.

Svalbard lies in the Norwegian Arctic between latitudes 74° N and 81° N and longitudes 10° E and 35° E, some 700 km north of mainland Norway. The archipelago has a land area of some 63,000km<sup>2</sup>, of which 60% is under permanent ice and snow (Hisdal, 1985). The climate is relatively mild for the latitude due to a northern branch of the north Atlantic drift transporting considerable heat northwards. Nonetheless, the annual mean temperature is -6.7 °C with only four summer months, June to September, recording positive monthly averages, July being the warmest month at +5.5 °C (DNMI). Monthly mean winter air temperature is often below -15 °C but daily minimum temperatures may decline to -40 °C on occasion. In the soil under snow, however, temperatures are often far less extreme