



First record of *Vulgarogamasus immanis* (Acari, Mesostigmata) in Svalbard

Dariusz J. GWIAZDOWICZ¹, Torstein SOLHØY², Stephen J. COULSON³,
Natalia V. LEBEDEVA⁴ and Elena N. MELEKHINA⁵

¹ Uniwersytet Przyrodniczy w Poznaniu, Zakład Ochrony Lasu, ul. Wojska Polskiego 71c,
60-625 Poznań, Poland <e-mail: dagwiazd@up.poznan.pl>

² Department of Biology, University of Bergen, Box 7800, 5200 Bergen, Norway

³ University Centre in Svalbard, P.O. Box 156, 9171 Longyearbyen, Norway

⁴ Russian Academy of Sciences, Southern Scientific Center,
Chekhov str., 344006 Rostov on Don, Russia

⁵ Russian Academy of Science, Institute of Biology, Komi Science Center,
Kommunisticheskaya str., 28, 167928 Syktyvkar, Russia

Abstract: The mesostigmatid mite *Vulgarogamasus immanis* (Berlese, 1904) is reported in Svalbard for the first time. The gamasid mite community of Svalbard is amongst the best known of invertebrate groups of the archipelago due to recent revisions based on fresh sampling campaigns. Nonetheless, a hitherto unrecorded species of gamasid mite was recently found along the strandline in Barentsburg. This record brings the total gamasid mite inventory of Svalbard to 23 species. The current inventory of Svalbard is bedeviled with synonyms and misidentifications. Nevertheless, resolving these confusions and maintaining an accurate and updated species inventory is of prime importance in understanding the ecology of this region. Especially in a period of rapid environmental change.

Key words: Arctic, Spitsbergen, Barentsburg, mite, Gamasida.

Introduction

Svalbard lies in the high Arctic between latitudes 74° N and 81° N and longitudes 10° E and 35° E, some 700 km north of the Norwegian mainland. The archipelago has a land area of some 63,000 km², of which 60% is under permanent ice and snow (Hisdal 1985). Despite its high Arctic location, the microarthropod fauna of the archipelago includes over 500 species names. This inventory is under constant revision to provide a baseline for a detailed understanding of the Arctic soil ecosystem and the detection of environmental change for which Svalbard is becoming a field laboratory (Ministry of Justice and the Police 2009). In a review

of the gamasid mite fauna of Svalbard, Ávila-Jiménez *et al.* (2011) identified a total of 22 species of gamasid mites from Svalbard. This checklist was based on identifications presented in recent discussions on the gamasid mite fauna of the archipelago by Krumpál *et al.* (1991), Byzova *et al.* (1995), Makarova (2000), Coulson *et al.* (2009), Gwiazdowicz and Rakowski (2009), Gwiazdowicz *et al.* (2009), Gwiazdowicz and Coulson (2010, 2011), Makarova (2011) and Lindquist and Makarova (2011), along with a thorough search through many extracted soil samples, taken from 18 localities spanning the entire north-south axis of Spitsbergen, the main island of the Svalbard group. Despite this effort, *V. immanis* was overlooked. This is especially unexpected as the species belongs to the largest gamasid mites, easily observable with the naked eye. Additionally the individuals were collected on the beach close to Russian town of Barentsburg and the now dismantled Spitsbergen Radio station at Green Harbour (today Finneset). Both settlements were established between 1911 and 1920 (Arlov 2003; Kristiansen 2005), early in the recent industrial history of Svalbard, and are hence amongst the historically most commonly visited localities by researchers in Svalbard, for example Thor (1930) and the Russian biologists working from the research stations in Barentsburg.

Material and methods

Material consisted of four specimens collected by hand searching from under stones on the beach immediately south of the Russian mining settlement of Barentsburg in Svalbard on 19 and 20 August 2011 (78° 02' 6.6'' N, 014° 12' 9.8'' E). Mites were found preferentially on damp silty sediment under stones around a drying pond behind the strandline where they were collected by pooter (aspirator). Animals were immediately preserved in 96% alcohol. For identification specimens were mounted in permanent slides (using Hoyer's medium). The pictures were prepared using a ZEISS AXIOSKOP 2 microscope with AxioCam MRc.

The material is deposited at the Department of Arctic Biology, University Centre in Svalbard (UNIS) and the University of Life Sciences, Department of Forest Protection, Poznań, Poland.

Results and remarks

Morphology of *Vulgarogamasus immanis* (Berlese, 1904) is presented below. The paucity of records of this species is extraordinary considering the size of the species, *e.g.* idiosoma of females is 2500–2700 µm long (Hyatt 1980). Specimens from Svalbard were smaller. The length of the idiosoma of females ranging from 2290 to 2310 µm and the width of the idiosoma ranging from 1350 to 1400 µm.

Female (N = 2) (Fig. 1). — Two shields are located on the dorsal side: podonotal shield (1250–1350 × 1150–1200 μm) and an opisthonotal shield (850–900 × 950–970 μm). The podonotal shield with 23 pairs of simple setae (about 100 μm), but seta r3 (250 μm) is longer. The opisthonotal shield has 22 pairs of simple setae (100–120 μm). The shields are covered with reticulate sculpture.

Tritosternum with a base 70 μm long and laciniae with a length of 240 μm are located on the ventral side above the sternal shield. Three pairs of setae (130 μm) are located on the sternal shield (550 μm long). Genital shield is triangular (480–500 × 490–500 μm). The peritreme (900 μm) does not reach coxa I.

Legs variable in length: I (2600 μm), II (1900 μm), III (1750 μm), IV (2200 μm).



Fig. 1. *Vulgarogamasus immanis* (Berlese, 1904) – female, sternal and genital shields.

Male (N = 1) (Fig. 2). — Idiosoma is 1950 μm long and 1100 μm wide. On the dorsal side there is the podonotal shield (1100 × 1100 μm) with 25 pairs of simple setae and the opisthonotal shield (900 × 1100 μm) with 48 pairs and 9 unpaired setae. Dorsal setae are long (140–150 μm), but r3 is longer (280 μm). The entire venter is very strongly sclerotized and finely reticulated. The setae are slender and simple (150 μm).

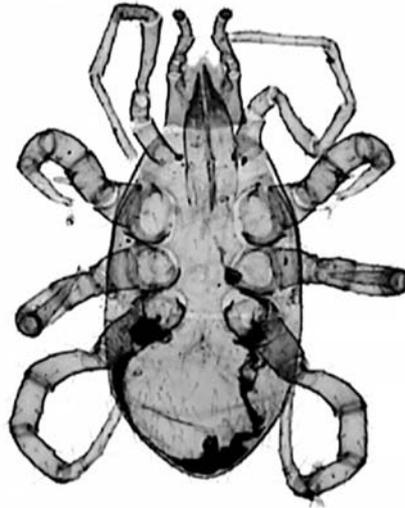


Fig. 2. *Vulgarogamasus immanis* (Berlese, 1904) – male.

Legs variable in length: I (2250 μm), II (1650 μm), III (1500 μm), IV (2200 μm).

Deutonymph (N = 1). — Idiosoma is 2150 μm long and 1200 μm wide. Two shields are located on the dorsal side: podonotal shield (810 \times 740 μm) and an opisthonotal shield (520 \times 600 μm). The podonotal shield with 16 pairs of simple setae (100–120 μm), but seta r3 (240 μm) is longer. The opisthonotal shield has 13 pairs of simple setae (120–130 μm). The shields are covered with reticulate sculpture.

Tritosternum with a base 70 μm long and laciniae with a length of 150 μm are located on the ventral side above the sternal shield. 3 pairs of setae (70 μm) are located on the sternal shield (550 \times 250 μm). The anal shield (150 \times 160 μm) with two para-anal setae (50 μm) and one postanal seta (65 μm). The peritreme (700 μm) does not reach coxa I.

Legs variable in length: I (1950 μm), II (1400 μm), III (1350 μm), IV (1850 μm).

The species was described by Berlese (1904) who examined two specimens from Ireland sent to him by Halbert. *V. immanis* has a palaeoarctic distribution, being recorded from Iceland, Norway, UK and Russia but not previously at such high latitudes. The material collected at Barentsburg comes from a typical habitat for this species, under decaying seaweed and under stones (Tichomirov 1977; Hyatt 1980; Karg 1993). Our record of *V. immanis* highlights that further study of the invertebrate biogeography of the high Arctic archipelago is required, with a special focus on taxa previously neglected.

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