

Taxonomy, microhabitat and geographic distribution of nematodes of order Dorylaimida from polar deserts

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Summary

The aim of this study was to investigate and compare the diversity of soil nematodes of order Dorylaimida in Arctic and Antarctic polar deserts. Four Arctic deserts were studied - two from Canadian and two from Russian Arctic. Two of them – the Plateau Putorana and the plateau of Devon Island represent altitudinal analogues of the polar deserts, that is so called nival deserts. In soil structure, flora and fauna, they resemble much the appearance of the typical polar deserts. Further, a polar desert on Livingston Island, Antarctic was studied. A total of 15 genera and 49 species, belonging to six families of order Dorylaimida were identified (two genera represented only by juveniles); 43 species (13 genera) were described and illustrated. Two genera and 31 species appeared as unknown to science. Family Qudsianematidae (6 genera and 29 species) was the most widespread, *Boreolaimus* which is absent in the dorylaimid fauna of the Antarctic, was the richest of species genus (14 species), followed by *Eudorylaimus* (9 species). Family Nordiidae formed another important element of the dorylaimid fauna in polar deserts (3 genera, 10 species); within this family the genus *Enchodelus* was recorded with the highest number of species – 7. Other recorded families were represented by one or two genera (one to three species).

The two plateaus can be distinguished by their highest taxonomic diversity: Putorana (16 species, 10 genera, 5 families) and Devon Island (13 species, 8 genera, 3 families). Arctic deserts of Bol'shevik Island (10 species, 5 genera, 2 families) and Ellef Ringnes Island (9 species, 4 genera, 2 families) showed lower dorylaimid diversity. Eight species were reported for the first time from Arctic polar deserts; two genera and 28 species were identified as new to the science. Ten species belonging to 6 genera and four families were recorded on Livingston Island, one genus and three species being new to the Antarctic fauna.

The two Polar Regions were characterised with specific dorylaimid fauna and a high percentage of endemism, which was better represented at species level. One endemic dorylaimid genus was registered for Livingston Island, while all Antarctic species are endemic. Only a small proportion of the species recorded from the Arctic deserts are widespread in the Northern hemisphere; 72% of the species studied are unknown to science. Majority of the species (82%, or (32 spp) were found only in one, and 18% (7 spp) were registered in more than one Arctic deserts.

The members of order Dorylaimida had high relative abundance in microhabitats of moss (36% (6-76%)) and grasses (family Poaceae 25% (6-53%)). They were poorly represented in the samples from bare soils. No specific biotopes' preference of dorylaimid species to certain microhabitats was revealed, which indicated that majority of species are polytopic.

The Arctic deserts are characterised with greater taxonomic richness of the dorylaimid fauna in comparison with the Antarctic. Dorylaimid fauna from Livingston Island showed lower species richness compared to the nival deserts on Plateau Putorana and Devon Island, but it is similar with polar deserts on Bol'shevik and Ellef Ringnes Islands.

The comparative analyses of the dorylaimid fauna of polar deserts based on our study and literature data clearly distinguished four groups of faunas: 1) the nival and polar deserts studied (Arctic), 2) Cape Chelyuskin (Arctic), 3) Maritime Antarctic, 4) Continental Antarctic. The islands from Maritime Antarctic showed higher level of similarity between one another than studied Arctic deserts and this trend appeared both at species and generic levels.