

**Diatom assemblages developing on soils exposed by the retreating Ecology Glacier
(King George Island, Antarctica)**

The Admiralty Bay Region (King George Island, Antarctica) is a representative part of the Maritime Antarctic Region with a mosaic of valuable natural habitats. The aim of the study was to determine the structure of diatom assemblages on soils uncovered by the retreating glacier, together with their taxonomic and ecological characteristics.

The material used in this study was collected from three transects on the Ecology Glacier Forefield during three Antarctic expeditions in 2002, 2007 and 2015.

The chemical parameters of soil samples from the Ecology Glacier Forefield showed high diversification of both reaction ($\text{pH} = 4.8\text{--}8.6$) and conductivity ($66\text{--}11\,650\,\mu\text{S cm}^{-1}$). Moreover the total content of carbon, nitrogen and also sulphur were very low.

A total of 133 diatom taxa (including species, varieties and marine taxa), belonging to 33 genera were identified. Almost half of all observed species have a restricted Antarctic and sub-Antarctic distribution, whereas 38% are endemic to the Maritime Antarctic Region. Only 13% have a typical cosmopolitan distribution. The most species-rich genera were: *Luticola*, *Pinnularia*, *Muelleria*, *Humidophila* and *Psammothidium*. Among all taxa, 19 were considered as dominant with 50 or more counted valves in at least one sample. Most of them are typical terrestrial species. At most sampling sites the most frequent taxa from all dominants were: *Chamaepinnularia krookiformis* (Krammer) Lange-Bertalot & Krammer, *Luticola quadriscrobiculata* Van de Vijver, *Luticola truncata* Kopalová & Van de Vijver, *Pinnularia borealis* Ehrenberg s.l., *Psammothidium rostrogermainii* Van de Vijver, Kopalová & Zidarova.

The most diverse diatom assemblages were observed at sites located in small valleys between moraines or depressions with soils covered by rare tufts of grass or clumps of mosses. The poorest sites (in term of species richness and number of counted valves) were situated directly in front of the glacier forehead, where only single valves were noted. Similar situation was observed in the areas influenced by penguin colonies, where, despite the low species diversity, the assemblages were dominated by numerous population of *Luticola truncata* Kopalová & Van de Vijver.

As a part of the study two diatom taxa were distinguished and described as new for science – *Humidophila komarekiana* Kochman-Kędziora, Noga, Zidarova, Kopalová & Van de Vijver and *Muelleria olechiae* Kochman-Kędziora, Noga, Van de Vijver & Stanek-Tarkowska.

Based on a statistical analysis, samples were subdivided in two groups. First group included sampling sites located on older moraines, especially in the areas of penguin colonies, while the second group contained sites located in lower parts of the forefield. The results of the research and statistical analysis showed that the main factors affecting the structure of diatom assemblages were nutrient concentration (mainly carbon and nitrogen) and conductivity.

Based on the available literature data, it was concluded that the diversity of soil diatom assemblages investigated on Ecology Glacier Forefield is similar to other assemblages in Maritime Antarctic Region with unique species composition at individual sites, at the same time.

This research is the first study of soil diatom assemblages in the Admiralty Bay region after the thorough taxonomic revision of the non-marine Antarctic diatom flora. Species characterizations and well-documented microphotographs contribute to the exact knowledge of the taxonomy, structure and ecology of Antarctic diatom flora.

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