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**Title:** *Ecological typification of arctic cryptogamic crust, Petunia Bay, Svalbard*

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The objective of this study was to describe various types of arctic soil crust that were collected in the vicinity of Petunia Bay, Svalbard in the 2012 summer season. The photosynthetic area of different soil crust samples was estimated using 2D epifluorescence images of the visible crust using a FluorCam 700MF fluorescence imaging camera (Photon Systems Instruments, Czech Republic). Biodiversity of cyanobacteria and microalgae from the collected soil crusts was analyzed using an Olympus SZX-ZB7 stereomicroscope and Olympus BX-51 light microscope (Olympus C&S, Japan). In most cases, cryptogamic crusts were dominated by cyanobacteria such as *Gloeocapsa sp.*, and *Nostoc sp.* The dominant green microalgae were *Coccomyxa sp.*, *Hormotila sp.*, and *Trebouxia sp.* which commonly occurred in a lichenised soil crust. Soil crusts that were located in conditions with high water content were dominated by *Nostoc sp.* Cryptogamic soil crusts from the studied area can be divided into three different types and classified: (1) black-brown soil crusts (with low diversity of cyanobacteria and microalgae), (2) brown soil crusts (with high diversity of cyanobacteria and microalgae) and (3) gray-brown soil crusts (with low diversity of cyanobacteria and algae). The occurrence of similar soil crust types were compared at different altitudes (350, 500, 700, and 800 m. a.s.l.). Differences in altitude do not affect the biodiversity of cyanobacteria and microalgae. However, their amount increases with increasing altitude.