Contrasting strategies to resist dehydration of a pair of *Nostoc commune* strains from aquatic and terrestrial habitats of Antarctica

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Cyanobacteria are phototrophic bacteria that can survive in a variety of extreme environments, such as in polar regions. They usually live in association with other organisms and may form biological soil crusts in terrestrial environments or thick benthic mats in aquatic environments. Cyanobacteria have developed different resistance traits to cope with extreme and contrasted environments, such as the production of pigments to absorb UV radiation, or a polysaccharidic matrix to withstand desiccation. In the present study, the ecophysiological performance of two *Nostoc commune* sp. strains was investigated under dehydration and subsequent re-hydration stress. The chosen pair of strains shares 100 % of 16S rRNA gene similarity but have different ecologies. Strains ULC180 and ULC008 from the BCCM/ULC culture collection were isolated from a granitic outcrop in the Sør Rondane Mountains (East Antarctica) and from the benthic mat of an Antarctic lake (Larsemann Hills, East Antarctica), respectively. To determine their capacity to withstand dehydration, both strains were cultured in $BG11_0$ medium, then left dehydrating onto filters placed into a desiccation chamber until complete dehydration (F_v/F_m around 0) and re-hydrated for up to 72 h. Samples for pigments, exopolysaccharide (EPS), osmolytes and transcriptomic studies were taken when the dehydration was complete and after 10 min, 24 h and 72 h of rewetting. Transcriptomics profiles showed that stress-related genes were induced in both strains during dehydration, such as those for the production of carotenoids, trehalose synthase and nitrogen fixation-related genes. The terrestrial strain responded with the up-regulation of a higher number of genes compared to the freshwater strain. The results suggest habitat specific adaptions to environmental stress.