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Title: *Novel Inclusions (Storage Material) in Cells of Arctic Strains of Cyanobacteria (Phormidium, Oscillatoriales)*

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Cyanobacteria belonging to the genus *Phormidium*, especially those which inhabit polar regions, are known for their capability of tolerating stresses of different kind, e.g. freezing and freezing-melting cycles, desiccation, starvation, and long-term light unavailability. They are well adapted to stressful conditions and often form macroscopic populations in the Arctic.

For understanding cyanobacterial stress resistance, the properties of survival cells are to be described. We have discovered that cyanobacterial cells are capable of accumulation of a liquid storage material in addition to cyanophycin, polyphosphates, and typically small lipid inclusions. The material is a hydrophobic substance, which forms a droplet and may occupy most of a cell volume. Such inclusions appear in the latest stages of growth in batch cultures as well as at the end of Arctic summer (West Spitsbergen), and never (in our experiments) in temperate and tropical *Phormidium* strains.

Similar inclusions, to our knowledge have not been previously described in the literature. We have studied these inclusions using light and confocal microscopy in combination with fluorescent staining, and also electron microscopy. We are currently analyzing their content with IR-spectroscopy and HPLC analysis.