



Identification and phenotypic plasticity of *Pseudanabaena catenata* from the Svalbard archipelago

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Abstract: A filamentous benthic cyanobacteria, strain USMAC16, was isolated from the High Arctic Svalbard archipelago, Norway, and a combination of morphological, ultrastructural and molecular characterisation (16S rRNA gene sequence) used to identify to species level. Cell dimensions, thylakoid arrangement and apical cell shape are consistent with the *Pseudanabaena* genus description. The molecular characterisation of *P. catenata* gave 100% similarity with *Pseudanabaena catenata* SAG 1464-1, originally reported from Germany. Strain USMAC16 was cultured under a range of temperature and photoperiod conditions, in solid and liquid media, and harvested at exponential phase to examine its phenotypic plasticity. Under different culture conditions, we observed considerable variations in cell dimensions. The longest cell ($5.91 \pm 0.13 \mu\text{m}$) was observed at 15°C under 12:12 light:dark, and the widest cell ($3.24 \pm 0.06 \mu\text{m}$) at 4°C under 12:12 light:dark in liquid media. The study provides baseline data documenting the morphological variation of *P. catenata* in response to changing temperature regimes.

Key words: Arctic, cyanobacteria, *Pseudanabaena*, polyphasic approach, 16S rRNA.

Introduction

The cyanobacterial genus *Pseudanabaena* (Lauterborn 1915) has undergone several taxonomic and systematic revisions. In traditional classification systems, the genus was placed in the family Oscillatoriaceae and contained only two species, namely, *P. catenata* and *P. constricta* (Szafer 1910) under (Geitler 1932). However, in the more recent cyanobacteria classification system