

Morphology based evaluation of long-term survival of cyanobacteria in water samples collected from selected extreme ecosystems of Sri Lanka

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Cyanobacteria are photosynthetic prokaryotes with a remarkable morphological diversity. Their ability to adapt environmental fluctuations ensures their long-term survival under extreme conditions. Few studies from Sri Lanka reported the distribution, identification, and the value addition of cyanobacteria from different environments nevertheless, their long-term survival under limited environmental conditions has not received adequate research attention. Hence, this study aimed to investigate the effect of long-term storage of water samples on the survival of culturable cyanobacteria. Water samples collected from three extreme ecosystems (salt marshes, mangroves, and hot water springs) of Sri Lanka, that have been stored for two and half years were chosen for this study. Cyanobacteria were isolated through a series of spread and streak plate culturing in BG11 and GO media and maintained under the light illumination range of 2000-3000 lux. Morphological identification of the isolates was performed based on the microscopic observations. Fourteen genera namely; *Leptolyngbya*, *Geitlerinema*, *Nodoselinea*, *Nostoc*, *Pseudanabaena*, *Oscillatoria*, *Phormidium*, *Mastigocladus*, *Fischerella*, *Chroococcus*, *Stanieria*, *Gleocapsa*, *Calothrix*, and *Anabaenopsis* were identified. Among them, *Leptolyngbya* was the dominant genus (26.6%). A previous study has recorded the presence of *Geitlerinema*, *Pseudanabaena*, *Leptolyngbya*, *Gleocapsa*, *Nodoselinea*, *Chroococcus*, *Microcystis*, *Oscillatoria*, *Calothrix*, and *Anabaenopsis* from the same sampling points. When comparing with it, only *Microcystis* was not found in the current study. However, genera of *Mastigocladus*, *Fischerella*, *Spirulina*, *Phormidium*, and *Stanieria* were only identified in the current study. Thus, the current study demonstrated proficient survival based on the pronounced morphological diversity of cyanobacteria under long-term storage under room conditions.

Keywords: *Cyanobacteria, extreme ecosystems, long-term survival, morphological diversity*

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