Abstract No: 185 ***Life Sciences***

MORPHOLOGICAL CHARACTERIZATION OF CYANOBACTERIA IN EXTREME ECOSYSTEMS OF SRI LANKA

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Sri Lanka, along with Western Ghats of India, is a biodiversity hotspot enriched with floral, faunal and microbial diversity. A diverse collection of ecosystems representing a range of environmental conditions contributes to this diversity. Ubiquitous, photosynthetic cyanobacteria with diverse morphological and biochemical modifications are a significant contributor of higher microbial diversity in these ecosystems. Being photosynthetic and capable of producing diverse, economically valuable bio-compounds make them ecologically and economically important. Most of them are fast growing and require less space and nutrients for growth, thus are economical over plant material in industry. They promote promising safe and low cost natural alternatives for current global demands: food shortage and Ultra Violet protection. However, most of their existence and diversity in these ecosystems is unnoticed thus not considerably discovered. Therefore, this study was carried out to investigate cyanobacteria diversity in extreme ecosystems of Sri Lanka based on morphological characterization. Two water samples were collected from surface and subsurface water in each site representing extreme ecosystems; 13 sites in salt marshes, 18 in mangroves, four in hot-water springs and four in lagoons. Culturing was carried out in BG 11 medium under 1,000 – 2,000 lux fluorescent light intensity with constant illumination at 25 - 30 °C. Purified monocultures were isolated by subsequent plate, liquid culturing and microscopic observations. Microscopic images were photographed with IMAGE FOCUS 4.0 software and morphologically characterized based on comparisons with available literature. One hundred and forty monocultures were isolated and 15 different cyanobacterial genera and orders including *Leptolyngbya*, *Oscillatoria*, *Nodosilinea*, *Anabaena*, *Geitlerinema*, *Gloeocapsa, Microcystis*, *Nostoc*, *Synechococcus*, *Lyngbya*, *Spirulina*, *Limnothrix*, *Pseudanabaena*, *Chroococcales* and *Oscillatoriales* were identified. *Leptolyngbya* is a dominant species in 12 salt marshes and 13 mangrove ecosystems while *Chroococcales* and *Pseudanabaena* were frequently recorded in all four studied hot-water springs. Morphological characterization revealed evidence for rich cyanobacteria diversity in extreme ecosystems in Sri Lanka. It further highlights the necessity of conserving this natural resource while utilizing them sustainably. Thus, extensive molecular characterization is necessary to provide a precise, informative and static picture of cyanobacterial diversity in Sri Lanka for conservation, future research and sustainable utilization of this valuable natural resource.

Financial assistance from the National Institute of Fundamental Studies is acknowledged.

Keywords: Cyanobacteria, Diversity, Extreme ecosystems, Morphology