

Algal diversity of East Calcutta Wetland, Ramsar site – Potential candidate for Phycoremediation of Metropolitan waste removal

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Abstract:

East Calcutta Wetland, the vast lowland on the eastern edge of the metropolitan city of Kolkata, India stands as a rare example where nature has developed its own ways towards environmental protection leading to development management. Other than being a Ramsar site, it is a model of a multiple use wetland. The resource recovery systems developed by the local people through ages using wastewater from the city is the largest in the world. The objective of this study was to evaluate the algal diversity of metropolitan waste water and to understand the natural waste recycling process by them. Cyanobacterial genera *Lyngbya*, *Oscillatoria*, *Phormidium*, *Arthospira* and *Synechocystis* and diatoms are the dominant algae in the direct sewage canals containing multiple metals like Cu, Zn, Cr and Pb, whereas *Synechococcus*, *Nostoc* and *Scenedesmus* sp. are particularly found in Bheries containing recycled water where pisciculture practice takes place. Totally 67 taxa of algae belonging to 38 species of cyanobacteria, 15 species of chlorophyta and 14 species belonging to bacillariophyta were reported during the study. Pure culture of algae from the different zones of the wetlands were isolated and preserved in the Visva-Bharati Culture Collection of Algae (VBCCA) WDCM931. The tolerance of isolated cyanobacteria *phormidium* and *Lyngbya* to counter heavy metals copper and zinc is remarkable. Both the species tolerate up to 10 ppm of Cu and Zn. *Lyngbya* produced lots of mucilage composed of polysaccharides which binds metals very well. In comparison to pure culture, immobilised cells of *Lyngbya* works very well for metal recovery. Phycoremediation using the algal isolates of East Calcutta Wetland is a viable method for recovery of valuable metals from the wetland itself and elsewhere. The diversity of algae in this unique ecosystem will be discussed in the presentation.

Key words: Algal diversity, East Calcutta Wetland, VBCCA, metropolitan waste water