

## **Impact of Heavy Metal Loading on Periphyton Productivity in a Heavily Dredged Estuary in Singapore**

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Ponggol estuary located on the northeastern coast of Singapore is heavily impacted by anthropogenic activities such as reclamation, construction and shipping activities. A year round fortnightly monitoring carried out from July 1999 to June 2000 for 5 species of heavy metals, viz., Sn, Pb, Ni, Cd and Cu, recorded very high concentrations in the particulate fraction and in sediments, when compared to the dissolved fraction in water. Intense dredging operations undertaken in the estuary is believed to resuspend the heavy metal rich sediments in the overlying water column. To ascertain this impact, in-situ mesocosm were set up using periphyton, which is important in the overall carbon budget of an ecosystem. Periphyton settlement slides, left in the field for 3 days were retrieved and exposed to different concentrations of heavy metals, observed during the monitoring study. Changes in chlorophyll *a* concentrations, taken as the measure of periphyton biomass, were recorded over 3 days of samplings. Results from this experiment show drastic reduction in biomass of upto 95-100% for concentrations reported for the particulate fraction and sediments when compared to the control, indicating the impact of such high levels of heavy metals on the resident biological communities. Interesting results from this study, suggest that periphyton can be used as a potential bio-indicator of heavy metal pollution.