

Gill cholinesterases in bivalves, *Crassostrea madrasensis* and *Anadara antiquata*: Evaluation of their potential use as biomarkers of neurotoxic contamination in brackish water bodies in Sri Lanka

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Estuaries and lagoons in Sri Lanka are increasingly threatened by anthropogenic pollution. Cholinesterases (ChEs) of bivalves inhabiting these brackish water bodies may be used as ecotoxicological warning signals of the occurrence and effects of aquatic pollution. The present study was undertaken to characterize the biochemical properties of ChEs in the gill tissues of two bivalves, *Crassostrea madrasensis* and *Anadara antiquata* using different substrates and selective inhibitors. In addition, sensitivities of gill ChEs of these bivalves to selected aquatic pollutants viz. Cadmium and Copper (heavy metals) and Chlorpyrifos (an organophosphate insecticide) were assessed.

Responses to specific substrates and inhibitors suggested the presence of two types of ChEs viz. Acetylcholinesterase and Butyrylcholinesterase in the gill tissues of both species. Dose dependent inhibition in the enzyme activities was observed in response to *in vitro* exposure to Copper and Cadmium and *in vivo* exposure to Chlorpyrifos. Both species showed similar sensitivity to the tested heavy metals. However gill ChEs of *Anadara antiquata* were more sensitive to Chlorpyrifos exposure than that of the other species. In conclusion, gill cholinesterases in the two bivalve species have a potential as biomarkers for monitoring neurotoxic pollutants in brackish water bodies in Sri Lanka.