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Deepulal P.M
Estuaries are dynamic ecosystems which has a connection with the open sea through which the seawater enters according to the rhythm of the tides. They are amongst the most polluted areas throughout the world, with about 60% of the world’s population living along estuaries and the coast. As a result, estuaries are suffering from degradation by many factors including sedimentation from soil erosion, from deforestation, overgrazing, over fishing, drainage, eutrophication due to excessive nutrients from sewage and animal wastes, pollutants including heavy metals, biocides, polychlorinated biphenyls, radionuclides and hydrocarbons. Estuaries are usually biologically highly productive zones. Due to heavy pollution load the biological productivity shrinks as it progress. They also acts as a filter for some dissolved constituents in river water, these precipitate in the zone where river water meets seawater. More important is the trapping of suspended mud and sand carried by rivers which leads to delta formations around estuaries.

The pollutants discharged into the estuaries are originate from two main sources-industrial and sewage. The former may be toxic which includes heavy metals, residues from antifouling paint particles and pesticides, while large discharges of sewage will contain pathogenic micro-organisms. The contamination is enough to destroy the amenities of the waterfront, and the toxic substances may completely destroy the marine life and damage to birds, fishes and other marine organisms. Antifouling biocides are a type of chemical used in marine structure to prevent biofouling. These antifouling biocides gradually leach from the ships and other marine structures into water and finally settled in sediments. Once a saturation adsorption is reached they desorbed into overlying water and causes threat to marine organisms. Previous reports explained the imposex and shell thickening in bivalves owing to the effect of biocides. So bivalves
are used as indicator organisms to understand the status of pollution. The nervous system is one of the best body part to understand the effect of toxicant. Acetylcholine esterase enzyme which is the main neurotransmitter in nervous was used to understand the effect of pollutants. Present study uses Acetylcholine esterase enzyme as pollution monitoring indicator.

The thesis is divided into seven chapters. Chapter 1 is the **Introduction** and its deals with general introduction of present study and includes the main objectives of the present study. Chapter 2 is **Materials and Methods** and deals with the nature of sampling location and analytical methods employed for the present study. Chapter 3 is **General Sedimentary Character of the Sediments** and it includes the general sedimentary parameters and biochemical composition like carbohydrates, lipids and proteins of sediments. Chapter 4 is **Evaluation of Redox Condition of Sediments using Rare Earth Elements.** This chapter explains the redox environment of sediment using the rare earth elements and also gives source of sediments. Chapter 5 is **Role of Trace Metals as Biocides.** This covers the main trace metals which are used in biocides and their distribution pattern in Cochin estuary. Chapter 6 is **Antifouling Biocides- Organic and Organometallics.** This includes the antifouling biocides used in shipping industry and the leaching status in the Cochin estuary. Chapter 7 is **Ecotoxicological Studies of Antifouling Biocides.** It deals with the inhibitory action of enzyme acetylcholine esterase in “*Villorita cyprinoides var cochinensis*” in the presence of biocides.