

## Monitoring the Pollution Status of the Goan Coast Using Genotoxicity Biomarkers in the Bivalve, *Meretrix ovum*

**Authors :** Avelyno D'Costa, S. K. Shyama, M. K. Praveen Kumar

**Abstract :** The coast of Goa, India receives constant anthropogenic stress through its major rivers which carry mining rejects of iron and manganese ores from upstream mining sites and petroleum hydrocarbons from shipping and harbor-related activities which put the aquatic fauna such as bivalves at risk. The present study reports the pollution status of the Goan coast by the above xenobiotics employing genotoxicity studies. This is further supplemented by the quantification of total petroleum hydrocarbons (TPHs) and various trace metals (iron, manganese, copper, cadmium, and lead) in gills of the estuarine clam, *Meretrix ovum* as well as from the surrounding water and sediment, over a two-year sampling period, from January 2013 to December 2014. Bivalves were collected from a probable unpolluted site at Palolem and a probable polluted site at Vasco, based upon the anthropogenic activities at these sites. Genotoxicity was assessed in the gill cells using the comet assay and micronucleus test. The quantity of TPHs and trace metals present in gill tissue, water and sediments were analyzed using spectrofluorometry and atomic absorption spectrophotometry (AAS), respectively. The statistical significance of data was analyzed employing Student's t-test. The relationship between DNA damage and pollutant concentrations was evaluated using multiple regression analysis. Significant DNA damage was observed in the bivalves collected from Vasco which is a region of high industrial activity. Concentrations of TPHs and trace metals (iron, manganese, and cadmium) were also found to be significantly high in gills of the bivalves collected from Vasco compared to those collected from Palolem. Further, the concentrations of these pollutants were also found to be significantly high in the water and sediments at Vasco compared to that of Palolem. This may be due to the lack of industrial activity at Palolem. A high positive correlation was observed between the pollutant levels and DNA damage in the bivalves collected from Vasco suggesting the genotoxic nature of these pollutants. Further, *M. ovum* can be used as a bioindicator species for monitoring the level of pollution of the estuarine/coastal regions by TPHs and trace metals.

**Keywords :** comet assay, metals, micronucleus test, total petroleum Hydrocarbons

**Conference Title :** ICETP 2018 : International Conference on Environmental Toxicology and Pharmacology

**Conference Location :** Amsterdam, Netherlands

**Conference Dates :** May 10-11, 2018