

## **BFA SEMINAR SERIES NO. 24**

### **Water Pollution and Endocrine Inhibitors in Bulawayo** Dr Yogeshkumar Naik

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Various toxins are present in aquatic systems, and the effects that they have on aquatic organisms using chemical and biochemical approaches need to be investigated. Terrestrial and aquatic pollutants may persist for extended periods in the environment causing both acute and chronic toxicity to humans and other organisms. Such persistent organic pollutants (POPs) (e.g. organochlorine pesticides, dioxins and PCBs) have long half-lives. They have been shown to have deleterious effects at the molecular, biochemical and physiological levels and include alterations in enzyme function, altered gene regulation and DNA damage as well as disruption of the endocrine (estrogenic/androgenic) systems. The impact of these chemicals and their effects on both vertebrates and invertebrates in the wild are attracting more and more interest as they can have major consequences on whole ecosystems in the long run. Endocrine disruptive agents can be found in agricultural run offs (Endosulfan, DDT metabolites) and industrial (dioxins/PCBs) waste-waters. However, certain plant (isoflavonoids) and fungal (zeralenone) metabolites known to cause similar effects are likely to be found in "pristine" natural water bodies.

Techniques to identify and study these pollutants include analytical chemistry (GC/AA) as well as biochemical (enzymatic, electrophoretic, ELISA etc.). Parameters being studied include detoxifying and other enzyme levels, hormonal levels and damage to DNA in aquatic vertebrate and invertebrate species. Where appropriate an interdisciplinary approach is used and other techniques such as immuno-histochemistry are also be incorporated. Correlations are also made between any altered biochemical parameters with tissue, water and benthic levels of pesticides and heavy metal pollutants are. The waters in southern Africa are relatively clean, but there are areas where there is a serious threat developing especially in mining areas and those involved in agriculture. Certain reservoirs where urban industrial effluent accumulates are also under serious threat.