

## **M.S.87. BABY, K.V.—Combined toxicity of heavy metals and petroleum hydrocarbons on selected marine organisms—1987— Dr. N.R. Menon**

The effect of heavy metals (Hg, Cd and Zn) and Oils (HSD and BH Crude) singly and in combination on the life and activity of the commercially important marine bivalve, *Perna indica* has been worked out. The information available on accumulative and depurative processes in marine bivalves is reviewed to understand the present status of our knowledge in this field.

The instrumentation and chemical methods along with experimental design to study oxygen consumption, filtration, rate of byssogenesis, accumulation and depuration are presented. The statistical techniques utilised for the computation of the data are also described.

At lethal levels, mercury was the most sensitive toxicant, followed by zinc and cadmium. Among the WAFs, HSD proved to be more deleterious to *Perna indica*. The results on combined toxicity show that combination of Hg with Cd, Zn, HSD or BH Crude WAFs produced more than additive reactions uniformly. A comparable trend was shown when Cd was administered in combination with other toxicants. When Zn was administered at comparatively higher levels along with Hg or Cd, only simple additivity was manifested. On the other hand, Zn when present in combination with WAFs of HSD and BH Crude, resulted in more than additive reaction in bringing about lethality.

All the metals singly or in combination proved to be respiratory depressants, whereas comparatively lower concentrations of WAFs of HSD and BH Crude elevated respiratory rates.

The rate at which particles was filtered when *Perna indica* exposed to toxicants individually and in combination was also worked out. The metals singly or in combination depressed filtration rate. Hg was the most toxic heavy metal and HSD WAF was more toxic than BH Crude WAF. Combined toxicity gave mixed rates.

The rate of byssus thread production was indirectly proportioned to toxicant concentration. Here also Hg proved to be the most toxic heavy metal.

Rates of oxygen consumption and filtration by *Perna indica* exposed to heavy metals and oil, individually and in combination for periods upto 21 days were documented. The animals as a rule performed decidedly at decreased rates when subjected to heavy metal and oil loads for periods from 1 to 21 days. When returned to normal sea water, the animals could not regain normalcy which was found to be statistically significant.