ACUTE TOXICITY, BIOACCUMULATION AND SUBLETHAL EFFECTS OF ENDRIN AND CARBOFURAN ON THE GIANT FRESHWATER PRAWNS, MACROBRACHIUM ROSENBERGII DE MAN

BY

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ABSTRACT

Acute toxicity of carbofuran and endrin to giant freshwater prawns, Macrobrachium rosenbergii de Man, were investigated using static bioassays under laboratory conditions. The 24-, 48-, 72-, and 96-hr. LC_{50} values of the prawns exposed to carbofuran were 0.1058, 0.0976, 0.0948 and 0.0889 mg/l respectively. Because of low mortality in the first two days, the LC_{50} values of the prawns exposed to endrin estimated by probit analysis could not be determined, however, the values estimated by graphs were 0.0014, 0.00325 mg/l for 24 and 48 hr. respectively. The 72- and 96-hr. LC_{50} values estimated by probit analysis were 0.000189 and 0.0001305 mg/l respectively.

Amount of carbofuran and endrin in the experimental ponds were studied. In the case of carbofuran, the carbofuran parent compound and 3-hydroxy carbofuran were in the non-detectable levels during 5 weeks. From the initial concentration, 0.013 µg/l, the endrin residues were 0.0093, 0.0056, 0.0027, 0.0045 and 0.01 µg/l in 5 weeks respectively.

The prawns exposed to the water contaminated with 0.013 µg/l of endrin. They accumulated endrin at the level of 0.32, 1.41, 2.87, 2.29 and 1.92 µg/kg in 5 weeks respectively. The bioaccumulation ratio were 34, 251, 1062, 508 and 192 folds in 5 weeks. The prawns exposed to 0.0089 mg/l of carbofuran showed non-detectable levels of carbofuran and 3-hydroxy carbofuran during 5 weeks.

Chronic effects of carbofuran and endrin on the prawns were also studied. The observed order of weight after 4 weeks was endrin > control > carbofuran. The prawns' survivalship was 100% in the control and in the carbofuran treatment, and 91% in the endrin treatment.