

Effects of Arsenic and Cadmium on the Post Larvae of Giant Freshwater Prawn (*Macrobrachium rosenbergii*): a Preliminary Study**Ranatunge R.A.A.R.¹, Wijesinghe M.R.^{1*}, De Silva D.N.¹ and Wijesekera R.D.²**¹*Department of Zoology, Faculty of Science, University of Colombo, Colombo 03, Sri Lanka*²*Department of Chemistry, Faculty of Science, University of Colombo, Colombo 03, Sri Lanka***mayuri@zoology.cmb.ac.lk***Abstract**

Arsenic (As) and Cadmium (Cd) are two of the heavy metals that gained public and national attention of the Sri Lankan community. Globally, As and Cd are reported as two of the most toxic heavy metals that cause physiological and biochemical alterations and mortality in exposed organisms. Cadmium levels in the range of 0.001 to 0.138 mg l⁻¹ have been reported in both ground and surface water sources of Sri Lanka. Few studies in the country have documented levels of arsenic in natural water bodies. Furthermore, studies assessing the potential toxicity of these two metals to species that are of importance to Sri Lanka, are scarce. The aim of this preliminary study was to investigate the effects of environmentally relevant levels of As and Cd on the commercially exploited fresh water prawn *Macrobrachium rosenbergii*, using its post larvae, which are initially released into reservoirs in Sri Lanka. Post larvae were collected from a culture facility in Pambala, Chilaw and were maintained in glass beakers. They were acclimatized before use for 96 hr acute toxicity trials, where they were exposed to a series of concentrations of either As (from 0.001 to 0.08 mg l⁻¹) and Cd (from 0.001 to 0.05 mg l⁻¹). Constant experimental conditions were maintained in both the control and treatment, each conducted in triplicate.

The results show that the heavy metals at the tested concentrations induced significantly higher levels of mortality ($p < 0.05$). For instance, the lowest test level of As (0.001 mg l⁻¹) induced a twofold higher level of mortality (50%) than the control (20 %), whilst that with the lowest level of Cd was also similarly high (46.7 %). A strong and positive dose dependent trend ($R^2 = 0.87$; $p < 0.05$) was, however, evident only for Cd. Comparing the toxicity of the heavy metals in terms of inducing mortality, Cd appears to be potentially more toxic than As. A level of 0.05 mg l⁻¹ of Cd induced 99 % mortality in the post larvae, whilst a higher level of As (0.08 mg l⁻¹) induced only around 56 % mortality. It is interesting that both heavy metals did not cause marked alterations in growth with no significant differences being evident between the body sizes of the control and treated larvae after exposure. It should however be noted that there was a greater deviation in body sizes in treated larvae than in those of the control, indicating that there may be differential sensitivity among the individual larvae. The results of this study are important since heavy metal pollution may threaten the income generating capacity of Sri Lanka's inland reservoir fishery.

Keywords: Cadmium, Arsenic, *Macrobrachium rosenbergii*, Toxicity, Survival