

Short Communication**Effect of urea and malathion on the freshwater prawn, *Macrobrachium lamarrei* (H.M. Edwards)****Anjuman Ara Ali, M. A. Mannan and Selina Parween***Department of Zoology, University of Rajshahi, Rajshahi-6205, Bangladesh.***Key words :** Agro-chemical, berried, survivability, hatchability.

Bangladesh being a densely populated country, it requires to grow more agro-fisheries crops within a short period. For successful bumper productions from land and water agro-chemicals have being used extensively. Agro-chemicals of the crop lands are continuously leaching and precipitating in the water bodies. After bio-magnification significant agro-chemical effects have been recognized in different tropic levels of the aquatic niche (Aquaculture News, 2003). Acute toxicity of agro-chemicals on fish has been exclusively reviewed by Johnson & Finley (1980) and Mehrle & Mayer (1985). The impact of chemical residues of agriculture and industries on the fisheries sector is presently a burning issue.

The present work was designed to assess the effect of urea and malathion, on the survivability of broods and eggs of the freshwater prawn *Macrobrachium lamarrei* (H.M.Edwards) in the laboratory.

Brood stocks of *M. lamarrei* were maintained in the Aqua-lab of the Department of Zoology, Rajshahi University. The experimental broods (mature unsexed prawns) were collected from the stock and acclimatized in aquarium with tap water and 24 hour aeration. Eggs were carefully collected from stage IV berried females (eggs with eye spots) and placed in tap water in 500 ml glass beakers with aeration. Commercial urea and malathion at required quantities were separately dissolved in 13 litre distilled water to prepare concentrations of 6, 8 and 10% of urea and 2, 4 and 6ppm of malathion. These concentrations of chemicals were chosen from the survivability screening in pilot experiments. Egg hatchability was tested in commercial mineral water and laboratory tap water, 8% urea and 4ppm malathion.

**Survivability test**

For survivability test of brood prawns 30-40 unsexed mature specimens were released in 2.5 litre of urea mixed water in aquaria with aeration. Three concentrations of urea and malathion were used in three replicats in separate aquaria. Ten specimens were used for each concentration of malathion and similarly in urea. Survivability was assessed after 72 hours of

exposure. The experiment was conducted at room temperature.

**Hatchability test**

Three berried females were released in 2.5 litres of tap or mineral water, 8% urea solution and 4ppm malathion solution, in separate aquaria at room temperature and aerated continuously. These females were allowed to release their eggs for 48 hours and then they were removed. The eggs were allowed to hatch and were counted after 10 days. The experiment was conducted with three replications.

Survivability of brood *M. lamarrei* after 72 hours in different concentration urea and malathion mixed water and in tap water are presented in Table-1. The agro-chemicals significantly reduced survivability rate of the broods. It was decreased to 31.94% in 10% urea and 0% in 6ppm malathion. It was observed that in tap water, broods released their eggs when they were kept longer than 72 hours. Wherever, in urea or malathion solution eggs in the berry were failed to develop, and dropped in the water as unhatched condition. The broods laid different number of eggs in tap and mineral water, urea and malathion solutions. The percentage of hatching in different conditions is present in Table 2. Hatching percentage eggs did not differ significantly between tap water (84.07%) and mineral water (82.83%). However, concentration of 8% urea and 4ppm malathion reduced hatching significant.

Sub-lethal concentrations of agro-pesticides commonly used in India have been reported to be toxic against *Penaeus monodon* after its 2<sup>nd</sup> or 3<sup>rd</sup> moulting (Nath *et al.* 2001). Sumithion, Methylparathion and Sherpa have been found to be toxic against *Macrobrachium rosenbergii* De Man (Yuan and Tan, 1992). Feeding on aquaculture chemicals like deltamethrin contaminated algae, reduced the reproductive development in copepods inhabiting in coastal water (Aquaculture News, 2003). Malathion had been reported to produce lethal effects and internal abnormalities in hardy fishes under laboratory trials such as *Heteropneustes fossilis*, *Anabas testudineus*, *Channa punctatus* (Ahmed, 1975; Khan & Ahmed, 1966; Anonymous, 2005).

The present results revealed that residual effect of urea and malathion, both are hazardous against the brood of

*M. lamarrei* and inhibit the completion of embryogenesis of their eggs. More detailed study is essential regarding the effect of agro-chemicals on the growth, development and reproduction of prawn.

**Table-1.** Survivability of brood *M. lamarrei* in different concentrations of urea and malathion treated water after 72 hours.

Observation	Tap water	Concentration of Urea (%)			Concentration of Malathion (ppm)		
		6	8	10	2	4	6
Percentage survived	94.99	87.77	81.11	31.94	63.30	63.67	0
t-value	-	3.02*	9.57***	46.36***	9.39***	6.97**	-

\*= P<0.05, \*\*\* = P<0.001

**Table-2** Hatching performance of mineral water, urea *M. lamarrei* eggs in tp water, and malathion

Tap water	Mineral water	Urea(8%)	Malathion (4ppm)
84.07%	82.83%	80.78%	55.61%
-	t = 0.82	t = 2.38*	t=27.31***

\*= p<0.05, \*\*\* =p<0.001

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