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ORIGINAL ARTICLE

Effect of Detergent Tide on *Paratelphusa Jacquemontiil* (Rathbun) Freshwater Crab from Vidarbha Region.

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ABSTRACT

Aquatic toxicology is a study of toxic substances present in water and their adverse effect including mortality in aquatic organisms. With the growing awareness of the hazards of indiscriminate water pollution, the aquatic toxicological studies are gaining more significance. Indiscriminate use of shampoos, soap and detergents cause water pollution. The present investigation is discus the effect of detergent tide on *Paratelphusa jarquemontii* (Rathbun) crab mortality.

KEYWORDS

Detergent tide, *Paratelphusa Jacquemontii* (Rathbun), Mortality

INTRODUCTION

Use of detergents are indiscreetly increased day by day by human as washing the cloth vehicles, vessels and most of the detergents does not degrading easily or they degrade very slowly in water body, it means, they remain in the aquatic system for longer time. They enter in the food chain of aquatic animals or absorbed through the gills or through the skin of the aquatic animals. Detergents are organic compounds, which have exist at phase boundaries, where they are of three types anionic, cationic and non–ionic detergents (Walker et al., 2001). Detergents which discharged in the water they may change pH, total alkalinity, free CO_2, DO and also affect the rate of photosynthesis and lead to eutrophication (Najam et al., 2010). Thus it has toxic effects on aquatic animals like fishes, causes mortality of animals.

Detergents can have poisonous effect in all types of quantities and this includes the biodegradable double layers that protect the fish from bacteria and parasites. Most fish will die when detergent concentrations in increased as low as 5 ppm will kill fish eggs and breeding ability of aquatic organisms. Detergents also effect on biochemical aspects of the animals and also change the concentration of proteins, fats and carbohydrates (Najam et al., 2010). Able (2006) reported synthetic detergents are acutely toxic to fish in concentration between 0.4 and 40 mg /lit .

The interaction between detergents and proteins, and their influence on membrane permeability may be the basis of the biological action of detergents. Saxena et al., (2005) reported the toxic effect of four commercial detergents (Two washing powders and two cakes) were reported on behaviour, mortality and RBC counts of a freshwater fish *Gambusia affinis,* Guppy fishes *Poecilie reticulata* (peters) are exotic fishes used to keep check on the mosquito the contamination of fresh waters with a wide range of pollutants has become a matters of concern over the last few decades population. (Vutukuru, 2005; Vinodhini and Narayanan, 2008).

Present investigation deals with the study of toxic effect of detergents on mortality of freshwater crab *Paratelphusa jacquemontii* (Rathbun).

MATERIALS AND METHODS

The crabs were collected from Nagthana dam near to the Warud city. The crab were selected for experiment based on size or lengthwise range from 7-8 cm in carapare width and weight about 100 - 130 gm. The crabs were acclimatized in glass aquaria in laboratory bay for 5-7 days as per APHA. The crowding was avoided, pH, DO and temperature were frequently checked and water was replaced daily after feeding the crabs. They were divided into different groups containing 10 crabs for the experiment. The detergent tide weighed accurately and dissolves in water before the transfer of crabs in to the aquaria and simultaneously a set of control animals were arranged.

The 100 percent mortality of crabs due to detergent was calculated as per APHA (1985) Observations on survival were made after 24 hrs. mortality was also observed if any in control groups. To calculate the mortality rate use the following formula.

$$\% \text{ Mortality} = \frac{\text{No. of Dead Crab} \times 100}{\text{Total no. of Crab}}$$

RESULTS AND DISCUSSION

The present investigation was discussed the effect of detergent tide on mortality of *Paratelphusa jarquemontii* (Rathbun). Table 1. Showing the dilution of 01 gm/lit and 2 gm/lit the rate of mortality was shown nil. The 3gm/lit was shown 20% Mortality. The 4 gm /lit was shown 30% mortality, in 5 gm/lit mortality was shown 50 %.

The 6gm/lit was shown 90% mortality, where as in the 7gm/lit was shown 100% mortality of fresh water crab *Paratelphusa jacquemontii* (Rathbun).

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Chourpagar and Kulkarni (2011) observed the heavy metal toxicity to freshwater crab, *Barytelphusa cunicularis* (Westwood) 50% mortality at 215 ppm. Najam et al., (2010) observed 100% mortality of guppy fishes *Poecilia reticulata* (Peters) at 0.00005 ml/L. Prakash (1996) observed 80% mortality of Tilapia sp. in 50 ppm detergent water while 100% mortality in 51 ppm of detergent water. Maruthanayagam (1997) reported 24 hrs. LC 50 value of detergent to Macrobranchium lamarrei was 0.5 %. Shingadia and Sakthivel (2003) reported 96 hours LC 50 value of wheel detergent for *Lamellidens marginalis* (Lamarck) was 400 ppm. Whereas study showed that the gill damage is the most obvious acute toxic effect; the immediate cause of death may be asphyxiation, but detergents may also be toxic internally. Sublethal effects include retardation of growth, alteration of feeding behaviour and inhibition of chemoreceptor organs (Abel, 2006).

Change in the diet, behaviour pattern and increase amount of detergent accumulate in the gills, loss of body balance, change the colour of carapace were observed

Table 1: Showing the Detergent concentration and mortality rate.

Sr. No.	Detergent Concentration	Total Crabs	Dead crab	Mortility
1	1 gm/lit	10	-	-
2	2 gm/lit	10	-	-
3	3 gm/lit	10	2	20%
4	4 gm/lit	10	3	30%
5	5 gm/lit	10	5	50%
6	6 gm/lit	10	9	90%
7	7 gm/lit	10	10	100%

It is known that the respiratory role alter under the influence of several biotic and abiotic factor (Prosser et al., 1973) pollutant acts as physiological stress or for exposed organisms as do the environmental parameters (Newell, 1973). The relationship between respiratory activity of animals and pollution has been reviewed by some workers (Roberts, 1972; Satyavely Ready et al., 1982).

When crabs were exposed to detergents tide the rate of oxygen consumption was decreased due to the presence of detergent in gills. The free CO2 was found to be nil in all experimental as well as in all control sets.

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