

**EFFECT OF FERTILIZER (DAP) ON OXYGEN CONSUMPTION BY
Barytelphusa cunicularis (WEST WOOD)**

M.H. Mujewar

Department of zoology, Shree Renukadevi Mahavidyalaya, Mahur

Abstract

*The rate of oxygen consumption of the crab *Barytelphusa cunicularis* increases from 24 hours to 72 hours and steep decreased at 96 hours exposed to the solution (0.25ppm) of DAP.*

Keywords: *Fertilizer (DAP), oxygen consumption rate, *Barytelphusa cunicularis**

Introduction

Fertilizer shows poisonous effect on aquatic flora and fauna. They destroy external mucus membrane on the gill of aquatic organisms and decrease breathing ability. Phosphate present in the algal blooms which release toxins and deplete oxygen in water. As oxygen consumption is a measure of metabolic state of animal, it is considered as an important parameter which indicates physiological and metabolic alterations in the animals. It is known that respiration alters under the influence of biotic and abiotic factors.[1] relationship between respiration with pollution has reviewed earlier by Roberts (1972) [2]

Normal respiratory area of gills may get altered due to the contact with polluted water. Hence, current investigation was undertaken to determine oxygen consumption of maintained in tropical freshwater amphibious field crab, *Barytelphusa cunicularis* exposed to the solution (0.25ppm) of DAP.

Materials and Methods

Animals were kept two days in laboratory for acclimatization in shallow tanks containing sufficient tap water, then transfer in to respective fertilizer does DAP at (0.25ppm) and controlled group is maintained simultaneously. During the period of studies temperature of water is 27°C. The water was changed every day, only male crabs weighing (30 to 40gms) were used for experiment and animals were not fed during the experimental period. After different time periods such as 24,48,72 and 96 hours. Oxygen consumption was studied using the apparatus devised by Saroja, (1959).

Water in the reservoir and animal chamber was maintained in appropriate volume, an initial sample of water was collected soon after the animal was placed in the chamber and final sample was collected after one hour respiration. The amount of dissolved oxygen in the sample was determined by the standard Winkler' method as given by Welsh and Smith, (1960). The oxygen consumed by the animals at each successive time interval of 24,48,72,96, hours, was calculated by collecting the sample of dissolved oxygen content in water from the set up before and after experimentation. The

difference between the initial and final samples gives oxygen consumed by the animals, the total and unit oxygen consumption were calculated. The values are expressed as CC of O₂ /hr/gm wet wt.

Result

The effect of fertilizer (DAP) causes increase in rate of oxygen consumption of fresh water crab, *Barytelphusa cunicularis* in lethal concentration of DAP at 0.25ppm. Initially the rate of oxygen consumption increases from 24 hours to 72 hours, and steep decrease at 96 hours. It is clear that fertilizer (DAP) exerts their effect to animal.

Effect of Fertilizer DAP on rate of Oxygen consumption of fresh water male crab, *Barytelphusa cunicularis*. O₂ Consumption expressed in terms of CC OF O₂ / hr/gm wet wt. an average of 6 observations ±S.D.

Time in Hours	Control	Experimental (DAP 0.25ppm)
24	0.099 ± 0.007	0.13 ± 0.001
48	0.11 ± 0.003	0.15 ± 0.002
72	0.12 ± 0.0005	0.16 ± 0.002
96	0.098 ± 0.002	0.14 ± 0.002

Discussion

The alterations in rate of oxygen consumption are available indicate of stress and are frequently used to evaluate in metabolic due to environment alteration. *Barytelphusa cunicularis* exposed to sublethal concentration of fertilizer DAP exhibit increase in the rate of oxygen consumption from 24 hours, and maximum at 72hours and decreases at 96 hours. This indicate that the long term exposure of toxicants causes increase in osmotic work of animals at cellular level resulting decrease in the rate of oxygen conception, this due to formation of mucus film over the body surface and gills must be taking place which interferes the respiratory functions and other vital activity of gills.

According to Skidmore and Tovell, (1972); Randal and Shelton, (1968) the restlessness and increased opercular movement in Rainbow trout when exposed to the pesticide, concentration of toxicants is characteristic of animals, put to the hypoxic

condition during hypoxia breathing rate is known to increase in order to compensate for the decreased PO_2 level of blood. It also implies impaired oxygen uptake due to gill damage.

Steve Morris (2005) observed the *Discoplax hirtipes* a terrestrial crab exhibits a seasonally dichotomous activity pattern governed by the seasonal rainfall on Christmas Island, with a breathing migration in the wet season.

Gills are the important respiratory organs and all metabolic pathway depends upon the efficiency of gills for their energy supply in sense the damage of these vital organs causes a sequential chain of destructive events which ultimately causes respiratory distress.

In present investigation result indicates, the rate of oxygen consumption of freshwater male crab, *Barytelphusa cunicularis* exposed to lethal concentration of fertilizer DAP at 0.25 ppm Showed significant alterations. The rate of oxygen consumption is found to be increased up to 72hours & decline at 96 z in fertilizers DAP. This may be due to suppression of metabolic activity of animals or due to disruption of the gills & coagulation of

gills mucus and inhibition of enzyme system at mitochondrial level.

References

1. Saroja, K. (1959) Studies on oxygen consumption in tropical poikilotherms. ii. Oxygenconsumption in relation to body size and temperature in the earth worm Maurilio, when submerged under water. Proc. Lnd. Acad. Sci. Vol. 49, pp-183-193.
2. Welsh, T.H.& Smith, R.I (1960) In: Laboratory exercises in invertebrates physiology Minneapolis, Burgess Publishing Co.
3. Skidmore, j. F. & Tovell, P.W.A (1972) Toxic effect of Zinc sulphate on the gills of Ranbow trout. Wat.Res. 210:670-673
4. Randal D.J. & Shelton (1968) Comp.Biochem. Physiol.,9:229.
5. Steve Morris (2005) Respiration and acid-base responses during migration And to exercise by the terrestrial crab, Discoplax (*casdisoma*) hirtipes,with regard to season,humidity and Behaviour. Journal of Exp.Biol.Vol.208, pp-4333-4343.