The Asian Journal of Animal Science (December, 2010), Vol. 5 Issue 2 : 209-211 | *RESEARCH ARTICLE*

Regulation of nitrogenous excretion under influence of temperature variations in freshwater clam , *Corbicula regularis*

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ABSTRACT

The biochemical activities including metabolism and catabolism are highly sensitive to temperature variations in all the living organisms.The nitrogenous wastes such as urea and ammonia contents in various tissues of *Corbicula regularis* were estimated under the influence of temperature variations.The contents were estimated at 18^{0}C, 24^{0}C, 30^{0}C and 35^{0}C.The tissue ammonia and urea contents as well as nitrogenous excretory products were increased with increase in temperature.

Key words : Clam , *Corbicula regularis*, Nitrogenous excretion.

Water temperature is one of the most dominant factors in the environment of aquatic organisms and plays a key role in determining their growth , behaviour and metabolism . Organisms may become physiologically stressed from exposure to heated water or can be directly killed if escape is not possible. If artificial heat loading is combined with natural seasonal warming of an aquatic ecosystem ,the impact can be quite severe. Besides causing outright death,the problem also may result in the interference with natural life processes such as growth rates, respiration, excretion, reproduction and distribution of species. Bivalves have been reported to be highly sensitive to chemical and mechanical disturbances of the external environments (Meyhofer , 1985). The pattern of nitrogen excretion in an animal depends upon its environment (Campbell, 1973).The impact of temperature on nitrogen metabolism and nitrogen excretion has been carried out in several molluscs, though the effect of temperature specially the freshwater clam has not received much attention and the present investigation is undertaken.

MATERIALS AND METHODS

The freshwater clam, *Corbicula regularis* was collected from Godavari river near by Nanded area in June 2010. The animals were acclimated in the glass aquarium containing freshwater in laboratory.The animals were sacrificed and various tissues like foot, hepatopancreas, mantle and adductor muscles were removed.The extracts of the above mentioned tissues were used for the estimation of ammonia and urea with respect to temperature variations and results compared with normal set. In the sets of experiment, the influence of temperature on nitrogenous wastes and nitrogen excretion was studied. Estimation of ammonia was carried out by the titration method as demonstrated by (Hawk *et al.,* 1954) and the urea was estimated by the method of Varley (1967).

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RESULTS AND DISCUSSION

The ammonia and urea contents of tissues were expressed in mg/g wet weight of tissue and the results are given in (Table 1).The tissue ammonia content at 18^{0}C was 1.78± 0.14 in mantle of *Corbicula regularis*.The content was increasing gradually with rise in temperature and reached to 1.89 ± 0.18 at 35^{0}C. The parallel trend was found in the other tissues like hepatopancreas ,foot and adductor muscles (Fig 1, 2, 3, and 4).

The urea content in the mantle of *Corbicula regularis* was0.87 ± 0.12 mg/g wet weight and it was increased to 1.02 ± 0.16. The increase and difference was significant at various temperatures. Elevated metabolic and excretion rates, typically seen during periods of warmer summer temperatures, have resulted in elevated levels of nitrogen release and subsequent increases in algal biomass (Vaughn *et al.*, 2007). The ambient temperature is an important factor that influences various biological functions and nitrogen excretion rates . The excretion rate of total ammonia nitrogen (TAN), total Kjeldahl nitrogen (TKN), and 5-