OSMOREGULATION IN OREOCHROMIS MOSSAMBICUS

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In Sri Lanka, brackish water bodies extend to about 150,000ha. It has been observed that O. mossambicus survive in brackish water and that it has potential for culture in this medium. In this study the mechanism of osmoregulation in fish adapted to fresh water and ½ sea water for over two weeks were experimently determined.

Plasma osmotic concentrations were determined by the method of depression of freezing point. Plasma osmotic concentrations and Na^+ concentrations in ½ sea water were significantly higher than in fesh water, (231.83 ± 5.246 mOsm/Kg and 172.5 ± 2.52meg/L in FW, 282, 242 ± 0.242mOsm/Kg and 181.2 ± 1.94 meg/L in ½SW). Plasma K^+ and Cl^- concentrations did not show significant differences in the two media, (5.64 ± 0.072 and 139.856 ± 4.3 meg/L in FW, 6.824 ± 0.681 and 145.0 ± 3.48 meg/l in ½SW). Metabolic rates too did not show a significant difference, (0.1495 ± 0.0127 $ml O_2/h/g$ in FW, 0.1302 ± 0.011$ml O_2/h/g$ in ½SW). Above values refer to mean ± s.e.

The linear relationship between Na^+ and osmotic concentrations of plasma show that the changes in plasma osmotic concentrations are due to change in Na^+ concentrations. Na^+ accounting for about 60% of the osmotic concentration is the most important osmotic constituent of plasma. The difference in osmotic concentrations between plasma and surrounding water in the two instances were 213 mOsm/Kg in fresh water and 358 mOsm/kg in sea water. Since the metabolic rated in the two instances were not different it seems that energy expenditure in osmoregulation in the two instances were similar. The steady state osmotic concentration was maintained at an elevated level in ½ sea water by expenditure of the same amount of energy as in fresh water which the fish normally inhabits.

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