**Abstract**

Eels are considered as a luxury food in several Asian and European countries. Modern eel culture exposes these fishes to various stressful conditions. The type of stress includesexternal factors such as air-exposures, submergence or handling disturbances. However, no information is available on the stress-induced changes on any parameters of this species.

Eels of species *Anguilla bengalensis* were selected and subjected to the followingStress conditions: C- control (not exposed to any stress treatment) T1-5 h air-exposure stress T2-10 h air-exposure stress T3 – 6h submergence stress T4 -12h submergence stress.

The effect of stress generally increases all the biochemical parameters during airexposure and submergence significantly (P<0.05) in the gills, heart, liver, kidney, brain, muscle, stomach and eyeballs. Pyruvate levels were also found to be increased in both he treatments. Decrease in glycogen and cholesterol levels were noticed in both the stresses. An irregular protein depletion and accumulation was recorded in the gills.Acid and alkaline phosphatases showed irregular decrease. The activity of Na,K ATPase found to be erratically accumulated in the eyeballs, gills and other tissues. Cat ATPase activity increased significantly (P<0.05) in the eyeballs. Other tissues exhibited either an increase or decrease in enzyme levels in all treatments. The ctivity of Mg\*\* ATPase decreased in all the tissues except eyeballs and gills.

While stress increased the RBC, Hb and Ht level, the clotting time decreased. Thrombocytes, MCV, MCH and MCHC showed either an increase or decrease. The decrease in the number of lymphocytes during stress and the gradual restoration to original level is definitely a hormone mediated biochemical change in haemopoetic stem cells. The present findings are valuable for live fish storage and transportation.