**Abstract**

The effects of air-exposure (6h) and submergence (6h) as monitored by determining RBC, Hb, Ht and blood glucose were analyzed in the exotic fish, Osphronemusolfax. Results obtained using multifactorial stress model (air-exposure, submergence, hypoxia) showed that elevation of RBC, Hb, Ht and blood glucose was linearly correlated with progressive stress uniformly. Submergence caused rapid stress with blood glucose reaching 50% elevation within 60 min. Hypoxic water with access to air had very little effect on blood glucose. Similarly, lowering the temperature significantly affected the blood parameters. The airexposed model was also used for testing lysozyme activity and phagocytosis assay during stress. Contrary top blood glucose, plasma lysozyme was significantly lower in air stressed than in unstressed fish. Submergence increased the numbers of granulocyte, lymphocyte