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Abstract

Importance of adrenal tissues of fishes as reliable stress biomarkers and agents of environment impact assessment.

Sushma Srivastava
CCS University, India.

Abstract:

As in other vertebrates, in fishes too, the adrenal tissues are the source of the synthesis and storage of the corticosteroids and catecholamines – the stress hormones. The corticosteroids are secreted by the interrenal tissues and the catecholamines are secreted by the chromaffin tissues of the adrenal gland. These stress hormones trigger a broad suite of morphological, biochemical and physiological changes which are considered as important indicators of stress induced changes. Experiments were conducted on two fishes, Carassius auratus and Heteropneustes fossilis that were exposed to moderate hypoxia (30-50 % dissolved oxygen saturation) and acute hypoxia (<30 % oxygen saturation). Their adrenal tissues were examined electron microscopically for the stress responses in the interrenal and chromaffin tissues. Differential stress responses were observed in these fishes – moderate hypoxia induced interrenal hyperactivity and chromaffin stimulation in C.auratus as against no noticeable changes in H.fossilis. The latter was stressed only under conditions of acute hypoxia showing degenerative changes in the interrenal cells and increased production of adrenaline granules in the chromaffin cells, however these changes were much reduced in comparison to that in C.auratus. Hypoxic environments impose considerable stress upon aquatic organisms to which they respond differently. The findings of the present study indicate the role of the interrenal tissues and the chromaffin tissues in countering stress and their significance as important and reliable stress biomarkers.

Biography:

Dr. S. Srivastava is currently Associate Professor and Head in the Dept. of Zoology, MM College, Modinagar, India.

She has 15 years of teaching and more than 25 years of research experience and has several research papers in reputed national and international journals and made presentations in various national and international Conferences. Dr. Srivastava has also coauthored two textbooks of fishery biology and fishery science.

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