Determination of stress levels of *Otolithoides biauritus* (Cantor, 1849) in selected zones of Indian Sundarbans

Jhinook Mitra & Sanjukta Mondal (Parui)*

Post Graduate Department of Zoology, Lady Brabourne College, Kolkata - 700 017, West Bengal, India

Received 21 November 2023; Revised 16 February 2024

The Indian Sundarbans is one of the three largest single tract mangrove forests of the world. The hydro-geochemical environment of this ecosystem is highly dynamic. Factors such as global warming, heavy siltation and solid waste disposal have caused considerable damage to the ecological status of the Indian Sundarbans and also affected the natural fish population. Here, we determined the stress levels of the amphidromous Sciaenid *Otolithoides biauritus* (Cantor, 1849) in response to water quality parameters of selected zones of Indian Sundarbans which can indicate its capacity to survive environmental stress by potentiating stress response through molecular activities. Samples were collected during the post-monsoon season in February 2023 from four stations namely S1 (22°09.943'N 088°53.325'E), S2 (22°09.661'N 088°54.948'E), S3 (22°00.857'N 088°45.567'E) and S4 (21°34.861'N 088°14.157'E) with different salinity regimes and the complete protein profile of muscles was established by SDS-PAGE. The concentrations of stress protein Hsp70 (pg/mL) and cortisol hormone (ng/mL) were determined via quantitative ELISA method. Physicochemical parameters such as water temperature, salinity, pH, dissolved oxygen, total dissolved solids (TDS), transparency and depth were recorded *in situ*. Nutrients such as nitrate, phosphate and silicate concentrations were estimated *via* standard spectrophotometric methods. A comparative account of the findings was established between S1, S2, S3 and S4. Highest average cortisol concentrations were observed at S1, while highest Hsp70 at S3. A 97 kDa protein was found exclusively at S2 while two proteins (26 kDa and 23.5 kDa) found at S1, S3 and S4, were absent at S2. S2 recorded least cortisol and Hsp70 levels. A long term monitoring is recommended for better understanding of the spatial variation of protein profile under fluctuating hydrodynamic conditions of the Indian Sundarbans.

Keywords: Aquatic pollution, Cortisol, Hsp70