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Adaptive Strategies of European Sea Bass (Dicentrarchus labrax) to Ocean Acidification and Salinity Stress

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Abstract : Atmospheric carbon dioxide (CO2) concentrations have been increasing since the beginning of the industrial revolution due to combustion of fossils fuel and many anthropogenic means. As the number of scenarios assembled by the International Panel on Climate Change (IPCC) predict a rise of pCO2 from today's 380 µatm to approximately 900 µatm until the year 2100 and a further rise of up to 1900 µatm by the year 2300. A rise in pCO2 results in more dissolution in ocean surface water which lead to cange in water pH, This phenomena of decrease in ocean pH due to increase on pCO2 is ocean acidification is considered a potential threat to the marine ecosystems and expected to affect fish as well as calcerious organisms. The situation may get worste when the stress of salinity adds on, due to migratory movement of fishes, where fish moves to different salinity region for various specific activities likes spawning and other. Therefore, to understand the interactive impact of these whole range of two important environmental abiotic stresses (viz. pCO2 ranging from 380 µatm, 900 µatm and 1900 µatm, along with salinity gradients of 32ppt, 10 ppt and 2.5ppt) on the ecophysiologal performance of fish, we investigated various biological adaptive response in European sea bass (Dicentrarchus labrax), a model estuarine teleost. Overall, we hypothesize that effect of ocean acidification would be exacerbate with shift in ambient salinity. Oxygen consumption, ammonia metabolism, iono-osmoregulation, energy budget, ion-regulatory enzymes, hormones and pH amendments in plasma were assayed as the potential indices of compensatory responses.

Keywords : ocean acidification, sea bass, pH climate change, salinity
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