

WHY ARE SEA BASS SO SUSCEPTIBLE TO STRESS?

INTERRENAL DYNAMICS PROVIDE SOME EXPLANATIONS

L. Tort¹,
J. Rotllant¹, M.J. Caballero², L. Robaina²,
M.S. Izquierdo² and D. Montero².

¹Unit of Animal Physiology. Dpt. Cell Biology, Physiology and Immunology.
Universitat Autònoma de Barcelona. 08193-Bellaterra. Spain

²Grupo de Investigación en Acuicultura. Inst. Canario Ciencias Marinas. 35200-
Telde. Las Palmas de Gran Canaria. Spain.

EXTENDED ABSTRACT ONLY – DO NOT CITE

One of the problems regarding the culture of sea bass *Dicentrarchus labrax* is the stress susceptibility of this species. This condition does not allow the producers to often handle the fish for practices such as grading in order to get homogeneous sizes or characteristics and commercialization value decreases in such non-homogeneous batches. The present work was undertaken to study the stress response of the sea bass subjected to acute stress by assessing the interrenal function of sea bass by measuring the levels of cortisol in both plasma and interrenal tissue and the time course recovery, the in vitro sensitivity to ACTH and specific histological features of the interrenal. Previous work on stressed sea bass showed levels of plasma cortisol, but the dynamics between interrenal production and release were not yet studied.

The results show a significant increase of plasma cortisol after 30 minutes and the levels are still higher after 1 hour of stress. Samples after 4h and 24h did not show significant changes respect to initial values. Regarding cortisol values in the interrenal tissue of head kidney, the results did not show an emptying process as in other fish, but a similar dynamics than in plasma with a significant increase at 30 minutes after stress and no changes compared to initial levels after 1h, 4h, or 24 hours. ACTH stimulated in vitro the production of cortisol but both basal and maximal levels were higher than in other sparid fish. The analysis of

the diameter of interrenal cell nucleus showed an increase concomitant with the cortisol release pattern

These results are discussed in terms of the short-term interrenal response of sea bass to an acute stressor. Compared to other fish such as tilapia, trout or other sparids such as sea bream, the sea bass shows a different dynamics. In these species, there is a clear inverse relationship between plasma cortisol and interrenal cortisol during stress. The results observed in sea bass could be explained by a different dynamics of the relationship between pituitary ACTH production, interrenal stimulation rates and interrenal sensitivity. It is suggested that the sea bass interrenal reacts to stressors by mainly increasing the synthesis of cortisol rather than releasing maximal amounts. These studies can help to understand the higher stress susceptibility of the sea bass compared with other species.

