# DOES THE FREE ION ACTIVITY MODEL APPLY TO ESTUARINE AND MARINE ENVIRONMENTS? A CASE STUDY FOR CD, CS, MN AND ZN IN THE EUROPEAN SEA BASS, *DICENTRARCHUS LABRAX* (L.)

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The Free-Ion Activity Model (FIAM) states that the primary metal form available for uptake is the free ionic form. Apart from some exceptions, this appears to be true for a range of freshwater compositions and freshwater organisms. However, for marine and estuarine organisms observations are not so straightforward and physiological adaptation to different salinities may play a key role. The aim of this study was to determine whether the FIAM was applicable for the uptake of four trace metals in a wide range of salinities going from 1ppt to 35ppt. European sea bass (*Dicentrarchus labrax*, L.), which are euryhaline marine and estuarine teleosts, were acclimated to hypo-, iso- and hyperosmotic media and for each of the acclimation conditions the uptake rate constants of Cd, Cs, Mn and Zn were determined simultaneously by means of their corresponding radio-tracers $^{109}$Cd, $^{137}$Cs, $^{54}$Mn and $^{65}$Zn. Uptake rate constants of Cd, Mn and Zn dropped approximately 23, 7 and 8 times, respectively, when salinity was raised from 1ppt to 35ppt. Although such a decrease is predicted by the FIAM, several deviations were observed for sea bass. Even more, Cs uptake did not significantly differ between the lowest and highest salinity. Besides the chemical composition of the environment, differences in fish physiology between hypo- and hyperosmotic conditions seemingly also influence metal uptake rates. Therefore, we postulate that fish physiology can be a crucial factor in determining metal uptake in this marine euryhaline species.