Marine macroalgae dietary supplementation shields the white seabream (*Diplodus sargus*) from the chromosomal damage caused by inorganic mercury

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Marine macroalgae have been studied as human health promoters. Despite the numerous advantages of marine macroalgae supplementation, its benefits to improve fish health condition remains elusive. This study aimed to investigate the genoprotection afforded by a marine macroalgae enriched diet to the white seabream (*Diplodus sargus*) when exposed to inorganic mercury (iHg), as well as its benefits on the hematological dynamics. For this purpose, fish were fed during 3 months with a marine macroalgae-enriched feed (Ma; total incorporation of 5%, with *Ulva rigida*, *Fucus vesiculosus* and *Gracilaria gracilis*, equitably represented), while non-supplemented fish were fed with a standard diet (S). Then, both dietary background groups were exposed to waterborne iHg (2 µg L^{-1}) for 7 days (E7) (groups MaHg and SHg), followed by a post-exposure period of 14 days (PE14) to address recovery. Control fish, unexposed to iHg, were maintained over the experiment (MaC and SC). At E7 and PE14, fish of the different groups (MaC, SC, MaHg, SHg) were sacrificed and blood was collected for the determination of total Hg levels, assessment of chromosomal integrity (as erythrocytic nuclear abnormality assay; ENA) and hematological dynamics (as erythrocytic maturity index; EMI) in peripheral erythrocytes. Fish that were fed with a macroalgae-enriched diet accumulated significantly lower levels of Hg than those under a standard diet, both at E7 and PE14. Accordingly, the ENA results pointed out a decrease of iHg genotoxicity at the group feed with the macroalgae-enriched diet at E7. Additionally, the EMI revealed an increase of class 2 erythrocytes in fish fed with a macroalgae-enriched diet upon exposure to iHg (E7), suggesting an increased cell lifespan. Overall, results are promising by revealing, for the first time, the genoprotection of a macroalgae dietary supplementation against the chromosomal damage induced by iHg in fish erythrocytes.

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