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ANTIOXIDANTS RESPONSE

LIVER HISTOPATHOLOGICAL ASSESSMENT IN WILD MULLET CHRONICALLY EXPOSED TO CU AND ZN.

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The use of biomarkers has become attractive and useful for monitoring environmental quality and the health of fish inhabiting polluted ecosystems. Liver plays a primary role in the metabolism of xenobiotic compounds and it is the main organ of accumulation and regulation of toxic substances. Liver histopathology has been used as an indicator of environmental stress since it provides a definite biological end-point of historical exposure and the kind of injury is often dependent upon time of exposure to pollutants, such as metals.

Mullet is one of the most resistant fish inhabiting polluted waters such as Esmoriz/Paramos coastal lagoon (Northwest Portugal coast). Previous studies showed that Cu and Zn are potential metal stressors because they accumulated in liver of mullet (*Liza saliens*). Data obtained showed that liver is the main organ involved in Cu metabolism and that accumulation was age dependent, whereas Zn was regulated in this organ. Liver ultrastructure revealed the presence of general diagnostic features as foci of necrosis and non-neoplastic lesions, such as hepatocellular and nuclear polymorphism, multicellular hypertrophy and focal hepatocyte death. Additionally an extensive area of heterogeneous parenchyma, composed of hepatocytes with different spectrum of vacuolization was observed and the presence of this alteration in lagoon mullets was associated with Cu and Zn exposure. Considering that mullet is living in the lagoon for its life span, a long-term evaluation of the stress responses was achieved which are more realistic than acute toxicity laboratory tests. Data obtained in this study may be useful to compare biomarker fish responses from other polluted sites.

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ense against environmental
stantly exposed to a myriad
iol (E2) on fish antioxidants
quatic environment released
of antioxidant enzymes viz.,
-transferase (GST) as well as
Dicentrarchus labrax L. (sea
ng/L or 2,000 ng/L) and i.p.
in GPX activity at lowest E2
and, E2 i.p. injected induced
he concentrations and GR at
significant GSht decrease at
etween the responses to the
s. E2, considered an aquatic
resting to note that gill being
well the exposition for E2 i.p