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Understanding the impact of silver as an emerging contaminant in the Ibaizabal and Gironde Estuaries

PROBLEMATIC

Gironde and Ibaizabal Estuaries have been historically exposed to metal pollution including copper (Cu) and silver (Ag), both regarded very toxic for aquatic biota. Although a general decrease in pollutant load has been reported in European estuaries, oysters from Gironde Estuary present the highest concentrations of Cu and Ag in France. Environmental monitoring programs have considered oysters good sentinel organisms in the assessment of coastal and estuarine health status. Biomarkers and chemical measurements in oyster's tissues integrate both exposure levels and effects of heavy metals in the environment. This study is focused in the understanding of Ag and Cu behaviour in estuaries using oysters, as sentinels of the metal pollution.



ACTIVITIES

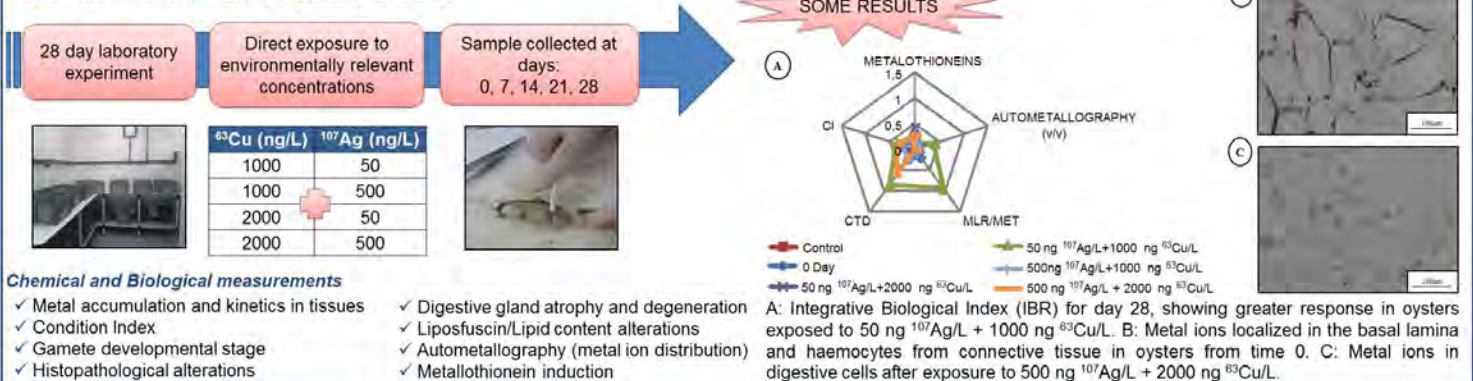
1. ESTUARY MONITORING



SOME RESULTS



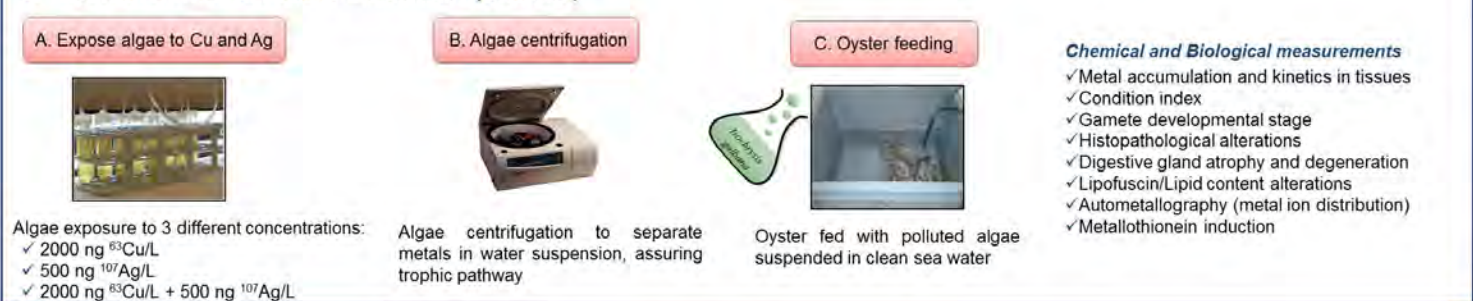
2. DIRECT PATHWAY EXPOSURE EXPERIMENT



Chemical and Biological measurements

- ✓ Metal accumulation and kinetics in tissues
- ✓ Condition Index
- ✓ Gamete developmental stage
- ✓ Histopathological alterations
- ✓ Digestive gland atrophy and degeneration
- ✓ Lipofuscin/Lipid content alterations
- ✓ Autometallography (metal ion distribution)
- ✓ Metallothionein induction

3. TROPIC PATHWAY EXPOSURE EXPERIMENT (ONGOING)



CONCLUSION

Preliminary results showed that oysters from the inner part of the Gironde estuary had bad health status, presenting severe tubule atrophy and degeneration of digestive gland tissue. Moreover the decrease of histopathological alterations in winter suggests a seasonal effect. On the other hand, the exposure to the combination of Ag and Cu, provoked an increase in the mortality as well as an impairment of digestive gland functions and reproduction failure.