POSTERS

ARSENIC-INDUCED OXIDATIVE AND CELLULAR STRESS IN THE FRESHWATER SNAIL *LYMNAEA STAGNALIS*

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Arsenic is a widespread environmental contaminant that poses a serious threat to aquatic ecosystems due to its persistence and toxicity. Although arsenic concentrations in some freshwater habitats may be high due to natural causes, they are more often the result of industrial pollution. Arsenic compounds are indeed used in the microelectronics industry for the manufacture of semiconductors, as well as in the production of dyes, textiles, paper and glass.

Molluscs are the organisms most frequently used for environmental biomonitoring and toxicology studies. The freshwater snail *Lymnaea stagnalis* is considered a valuable bioindicator species due to its high sensitivity to aquatic pollutants and, at the same time, its ability to accumulate toxic substances. In the present study, we investigated the biological effects of environmentally relevant arsenic exposure in *L. stagnalis* tissues, with particular attention to the onset of oxidative stress and cellular responses.

Adult snails were exposed to a concentration of arsenic representative of contaminated freshwater environments for 7 days. Exposure to arsenic resulted in significant alterations to the digestive gland - the main organ involved in detoxification - including tissue disorganization, increased cytoplasmic vacuolization and inflammatory cell infiltration. Biochemical analyses revealed a marked increase in reactive oxygen species, suggesting the onset of oxidative stress. In parallel, the expression of the stress-related protein HSP70 increased significantly, confirming the activation of cellular protective mechanisms. Moreover, modulation of apoptotic markers suggested that arsenic exposure may trigger the early stages of programmed cell death.

These findings demonstrate that arsenic exposure can induce significant structural and molecular alterations in *L. stagnalis*, confirming the sensitivity of this species to metal contamination. This study therefore supports the use of *L. stagnalis* as a reliable sentinel organism for monitoring freshwater pollution and for understanding the mechanisms of arsenic toxicity in aquatic invertebrates.