
Effects of Nanoplastics on Canadian and Guadeloupean Oysters

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An international research shows that the exposure of oysters to nanoplastics and arsenic could affect their biological functions.

Oysters' exposure to plastics is concerning, particularly because these materials can accumulate and release metals which are then absorbed by the molluscs. According to a recent study published in the journal [Chemosphere](#), the combined presence of nanoplastics and arsenic affects the biological functions of oysters. This study was conducted by the Institut national de la recherche scientifique ([INRS](#)) in Québec City and the French National Centre for Scientific Research ([CNRS](#)) at the [University of Bordeaux](#) in [France](#).

The international research team chose to study arsenic, since it is one of the most common metals absorbed by the plastic debris collected from the beaches of Guadeloupe.

"Oysters easily accumulate metals from the environment into their tissues. We therefore wanted to test whether the combined exposure to nanoplastics and arsenic would increase the bioaccumulation of this contaminant." Marc Lebordais, the Master's student in charge of the research.

The scientists proved that the bioaccumulation of arsenic does not increase when nanoplastics are also present. However, it remained higher in the gills of the Canadian *Crassostrea virginica* oyster than in the *Isognomon alatus* oyster, found in Guadeloupe. These results are the first to highlight the diverging sensitivity of different species.

Gene deregulation

In addition to bioaccumulation, the team also observed an overexpression of genes responsible for cell death and the number of mitochondria—a cell's energy centres—in *C. virginica*. In *I. alatus*, the expression of these same genes was less significant.

“Evaluating the expression of genes involved in important functions, such as cell death and detoxification, gives us information on the toxicity of nanoplastics and arsenic on a cellular level,” explained the young researcher, who is co-directed by Professors Valérie Langlois of INRS and Magalie Baudrimont of the University of Bordeaux.

The food chain

The next step, after characterizing the presence of nanoplastics and arsenic in oysters, would be to study how these contaminants are transferred through the food chain.

“Analytical tools are currently being developed to quantify the presence of nanoplastics in biological tissues,” said Marc Lebordais. “Understanding the amount of nanoplastics in farmed oysters currently boils down to a technical issue.”

Read the [original article](#) on Institut national de la recherche scientifique (INRS).