

Effects of pre-exposure on the tolerance of *Artemia* to oil and oil dispersants

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Abstract

This paper tries to contribute to a better understanding of the effects of chronic low-level oil contamination of seawater which, according to some authors, constitutes a major long-term problem for the marine environment.

Are the biological processes of marine organisms affected by low levels of petroleum as some authors claim, or does the continuous input of petroleum have but little or no demonstrable adverse effects on marine populations or their activities?

Since metal resistant strains of organisms have been collected from contaminated areas and since it has been demonstrated that the tolerance of marine organisms to metals can be increased by pre-exposure to low levels of metals, the question arises in the case of oil pollution, whether one can obtain animals of increased tolerance by pre-exposing them to oil.

Experiments have been conducted in which adult *Artemia* were exposed to various concentrations of oil (Tunisian crude, zaraitine type), two oil dispersants (Finasol OSR-2 and OSR-5), and a mixture of oil and dispersants.

After this pre-exposure the *Artemia* were subjected to the same toxicants whereby two effects were measured:

- acute toxicity (LC50 48 h);
- sublethal toxicity (respiration rate).

The results show that adaptation to oil and oil dispersants occurs after pre-exposure as expressed by a higher resistance of the brine shrimp when subsequently submitted to the toxicants.

In the case of pre-exposure to low concentrations of both pollutants, the acquisition of resistance is a slowly-progressing mechanism which is not reversed nor lost after transfer into clean water (detoxification). Pre-exposure to higher concentrations of the chemicals results in a rapid induction of resistance which is, however, partially lost after transfer to clean water conditions.