

Impacts of rubber debris on oysters

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Résumé (250 mots max.)

Risks linked to the pervasive contamination by plastic waste is an important issue. Among the diversity of polymers, rubber materials are an important part of the waste production. During the manufacturing, rubber is associated to a large diversity of chemical compounds (metals, HAPs, additives) which can represent more than 50% by mass of the final product. We used the oyster *Crassostrea gigas* as model owing to its ecological, functional and economic roles in coastal waters. A total of three experiments were performed to assess the effects of rubber particles and/or associated-chemicals (also called leachates) on: (i) oyster early life stages (gametes and embryos viabilities); (ii) juvenile ecophysiology (feeding, respiration, energy budget); (iii) Adult physiology and reproduction (growth, feeding, gametogenesis, gametes and larval qualities). The dose-response experiments suggested that rubber leachates (from tires, crumb rubber granulates and oyster-farming rubber bands) have the potential to reduce gametes and embryos viabilities (from a concentration of 1 g L⁻¹) as well as the ecophysiological parameters of oyster juveniles (from a concentration of 0.001 g L⁻¹). By contrast, the chronic exposures (9-weeks) of adult oyster to lower realistic doses of microtire particles (MT) or leachates (10 and 100 MT mL⁻¹, equivalent to 5.2 and 52 µg L⁻¹) revealed no effects on the measured phenotypic functions. This work suggest that rubber debris can be detrimental on oysters depending on the dose, duration of exposure and life stage, highlighting the need to measure the transfer of rubber debris and associated chemicals from human activities to coastal areas.

Mots clés : Tire, Oyster, Ecotoxicology, Microplastics, Leachates

Thème(s) :

- ~~1/ Sources, Niveaux de contamination, Modélisation~~
- ~~2/ Mécanismes de transformation des plastiques~~
- 3/ Impacts des plastiques et risques sur les organismes et les écosystèmes
- ~~4/ Conception de polymères à plus faible impact environnemental, Solutions~~
- ~~5/ Approches sociologique, socio-économique, nouveaux modèles économiques~~