

Disposable COVID-19 face masks are an underpinned threat for two key intertidal species

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Résumé (250 mots max.)

The emergence COVID-19 and its subsequent declaration as a pandemic led to an unprecedented global demand for personal protective products. The related face covering to moderate down the transmission of the virus led to a dramatic increase in the production of disposable masks worldwide, which were subsequently increasingly found littering beaches. Disposable face masks are produced from various plastic polymers that are a source of particle pollution in aquatic environments. The environmental impact of mask fibers, and the far more pernicious effects of mask leachates, is still an open question.

We show that the behavioral traits of two keystone intertidal species, the blue mussel *Mytilus edulis* and the common periwinkle *Littorina littorea*, are significantly affected by both the presence of disposable masks and their leachates. *M. edulis* avoid mask fragments, and aggregate faster and more when exposed to leachate. In turn, though *L. littorea* did not exhibit any avoidance behaviour of mask fragments, they significantly modify their motion behaviour while crawling on them, and increased their aggregation behaviour following exposure to mask fragments and their leachate.

Our results demonstrate how the mitigation measures related to control the spread of the COVID-19 pandemic affects intertidal species, including an autogenic ecological engineer. The disturbance of these foundation species has implications for central ecosystems services, such as habitat and biodiversity sustainability and impacting secondary and tertiary production. Our results further suggest that the current pandemic may have unanticipated environmental consequences and influence aquatic ecosystems in powerful ways.

Mots clés : COVID-19, Face masks, Leachates, *Mytilus edulis*, *Littorina littorea*, Behaviour