

IMPACTS OF ANTHROPOGENIC NOISE ON CEPHALOCHORDATES

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Human activities have significantly altered the natural soundscape of the oceans, posing a growing threat to these ecosystems. Anthropogenic underwater noise is known to detrimentally affect many marine species. However, most research has focused on sound perception in mammals and fish, while invertebrate bioacoustics and their responses remain largely understudied. Cephalochordates (amphioxus), due to their vertebrate-like anatomical traits and sensory cells homologous to hair cells, serve as an ideal model for studying the effect of noise pollution. In this study we investigated the effects of marine noise on *Branchiostoma lanceolatum* by analyzing biochemical parameters, transcriptomic profiles via RNA-sequencing, and filter-feeding activity. Laboratory tests utilized two soundtracks of maritime

traffic noise: a real underwater recording and a synthetic one, created according to the Marine Strategy Framework Directive. Amphioxus were exposed to noise for 1 hour and then kept in silence. Responses were measured immediately and after 24 hours of recovery. The results suggest that amphioxus can perceive acoustic stimuli and that noise exposure can significantly affect this species. Our findings highlight the urgent need to further investigate anthropogenic underwater noise in marine environments, emphasizing its detrimental impact on marine invertebrates.

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