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Designation:

Description:

Human activities have increased the nitrogen inputs in coastal areas affecting water quality and marine biodiversity. Sea cucumbers are benthic invertebrates inhabiting both shallow and deep waters and are key species recycling organic matter. Moreover, they are highly demanded for human consumption mostly in Asia, leading to overfishing and, consequently, a critical decline. Previous studies, in aquaculture tanks, have shown that holothurians are able to remove nitrates from the seawater. However, the ultimate players of this role of holothurians could be related to their bacterial symbionts. Here, we explored the occurrence of bacterial symbionts, including potential denitrifiers, in the mucus and subcuticle of *Holothurian tubulosa*. We performed cuticle biopsies in various specimens and took mucus using cotton swabs. In these samples, we extracted DNA, amplified the V3 and V4 hypervariable regions of 16S RNA gene, and checked for the presence of the genes that code the nitrite reductase (i.e., *nirS*) and the nitrous oxide reductase (i.e., *nosZ*) enzymes during denitrification. We described the taxonomic composition of holothurian bacterial symbionts and confirmed the presence of the above-mentioned functional genes in the holothurian mucus. These results suggest that sea cucumbers might have a relevant role in nitrogen removal in coastal areas beyond detritus processing. This knowledge can also be useful for aquaculture practices and to understand the potential ecosystem services of sea cucumbers in coastal ecosystems.

Category: Scientific Program Abstract > Special Sessions > SS34
Invertebrate-microbes associations and their relevance in

biogeochemical processes: from loose relationships to intimate symbioses

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EVIDENCE OF POTENTIAL DENITRIFICATION IN THE HOLOBIONT *HOLOTHURIA TUBULOSA*

Category

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