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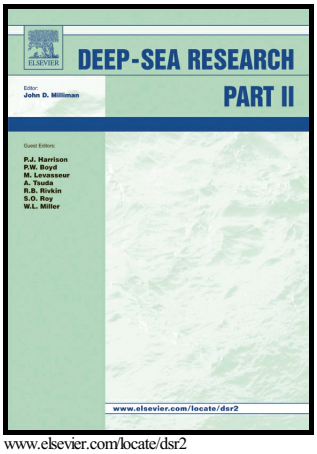

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Exploring deep-water coral communities using environmental DNA

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Abstract

Environmental DNA (eDNA) sequencing has emerged as a valuable tool for biodiversity surveys, allowing identification of taxa that may be missed by more traditional methods. Deep-sea corals, while increasingly recognized as a valuable source of habitat in the deep-ocean, have traditionally been challenging to survey. Obstacles to traditional visual surveys of these animals include the expense and complexity inherent to working in the deep marine environment, as well as the existing taxonomic uncertainty and morphological variation which can make deep-sea octocorals difficult to identify visually to the species level. This study tests an eDNA protocol for identification of deep-sea octocorals from water samples collected during the E/V *Nautilus* 2016 cruise season. Using this protocol, we were able to sequence eDNA from octocorals, and use these data along with image data collected during the cruise to identify taxa to the species level in a variety of habitats. eDNA sampling has the potential to complement traditional deep-sea coral surveys by overcoming the difficulty in visually identifying deep-sea octocorals and characterizing their diversity.

Keywords: E/V *Nautilus*, remotely operated vehicle (ROV), deep-sea, coral, environmental DNA, DNA