Effect of the brittle star Amphiura filiformis (Amphiuridae, Echinodermata) on oxygen flux into the sediment

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ABSTRACT: O_2 plays a key role in early sedimentary diagenetic processes, but the effect of most macrofaunal species on the pathways and rates of supply of O_2 into the seabed are not well known. We investigated the effect of the ophiuroid *Amphiura filiformis*, one of the dominant macrobenthic species on soft bottoms in the northeast Atlantic, at depths of ~15-100 m, in a laboratory environment. We determined how the presence of the ophiuroid changed the total O_2 uptake of macrofauna-free sediment by combining measurements from a microcosm approach and an approach that uses microelectrodes and a flushed aquarium. We suggest that natural populations of *A. filiformis* can account for 80% of the total flux of O_2 into the soft bottom. At least 67% of this portion is due to the diffusion of O_2 across additional sediment-water interfaces excavated by the brittle star.