ASTRONOMICAL AND ATMOSPHERIC IMPACTS ON DEEP-SEA HYDROTHERMAL VENT INVERTEBRATES

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Ocean tides and winter surface storms are among the main factors driving the dynamics and spatial structure of marine coastal species, but the understanding of their impact on deep-sea and hydrothermal vent communities is still limited. Multidisciplinary deep-sea observatories offer an essential tool to study behavioural rhythms and interactions between hydrothermal community dynamics and environmental fluctuations. One of the Ocean Networks Canada observatory site located on the Endeavour segment of the Juan de Fuca Ridge hosts various measurement instruments and an ecological module called TEMPO-mini. Deployed on the Grotto hydrothermal edifice, at 2186 m depth, the module acquires real-time and continuous imagery along with temperature and oxygen data. The camera module is focused on a Ridgeia piscesae tubeworm vent assemblage nearby a hydrothermal diffusion area. Here, we investigated whether species associated with the tubeworm assemblage respond to local ocean dynamics. We provide the first evidence that tides and winter surface storms influence the distribution patterns of mobile and non-symbiotic hydrothermal species (i.e., pycnogonids Sericosura sp. and Polynoidae polychaetes). Local ocean dynamics affect the balance between hydrothermal fluid inputs and the surrounding seawater, modifying the physical and chemical conditions of the vent habitat. Hydrothermal species react to these habitat modifications by adjusting their behaviour, e.g. by moving up and down the tubeworm assemblage, in search of optimal conditions. This behaviour may reflect a specific adaptation of vent species to their highly variable habitat.