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Meiofaunal communities and nematode diversity characterizing the Secca delle Fumose shallow vent area (Gulf of Naples, Italy)

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Shallow-water hydrothermal vents release gas and hot water, thus creating extreme local conditions. Despite their ubiquitous distribution in tectonically active coastal zones, shallow-water vents have been less explored than deep-sea vents in terms of biodiversity and adaptations to extreme conditions. For the first time, the distribution and diversity of meiofauna and nematode communities inhabiting the Secca delle Fumose (SdF) shallow water vent were investigated. The SdF is a submarine relief consisting of a network of ancient Roman pillars, among which thermal vents discharging hot gas-rich hydrothermal fluids occur.

We selected 4 stations, two characterized by the presence of vent emissions (H=cold emission; S=hot emission) and two controls without vent emission, at comparable water depth. The highest meiofaunal abundance was reported at station S and the lowest at station H. Conversely, station H was characterized by the highest biomass due to the dominance of *Oncholaimus* sp., known to tolerate extreme geothermal conditions and high sulphide concentrations. Nematode and Copepoda were the most represented taxa. Copepods dominated at station H, probably promoted by a higher percentage of coarse grain size and by the intermediate disturbance generated by gas bubbling. Meiofauna and nematode diversity was depressed at station H, but comparable between station S and controls. A high turnover in nematode community composition was reported between all sampling stations. Apparently, each station had a unique nematode community, probably generated by an extreme spatial heterogeneity characterizing the SdF area. The hypothesis that in shallow vents nematodes included a subset of species that lived in control sediments was not confirmed in our study. Even if nematode assemblages were highly diverse, epistrate feeders and carnivores were the most represented trophic groups at all stations, indicating a community of organisms that feed on the available organic resources.

Keywords: Secca delle Fumose, Gulf of Naples, shallow vents, meiofauna, nematodes