

Microbial communities as early warning indicator in response to the acidification process in shallow hydrothermal vent (Levante Bay, Vulcano Island)

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Microbial communities living in shallow hydrothermal vents have been recently demonstrated to be excellent indicators of environmental disturbance factors. Recent studies reported how the acidification phenomena are reflected in the taxonomic shifts of microbial communities from hydrothermal sites (1,2). The present study was aimed at deciphering the biodiversity of microbial communities inhabiting the hydrothermal system of Levante Bay (Vulcano Island), after the intense outgassing event that occurred in July 2022. Water and sediment samples were collected in the Principal Vent site (VPV), and at a distant site, used as a control (VC). In the VPV site samples of flocculi suspended in the water column were also collected. A metagenomic approach was applied to decipher the taxonomic composition of microbial assemblages, that were furtherly compared with data obtained for the same area in 2021. The results showed strong shifts in both water and sediment communities with the increase in relative abundance of *Campylobacterota*. At the family level, a very high relative abundance for *Thiomicrospiraceae* was retrieved in the water samples from VPV, followed by *Campylobacteraceae* in the sediment from the same site. *Sulfurimonadaceae*, *Sulfurovaceae* and *Spirochaetaceae* were abundant in the flocculi and sediments from VPV. The comparison of results obtained in 2021 and 2022 showed an adaptive response of the microbial communities, especially in the sediment systems. Overall, the study confirmed the possible use of microbial variables as indicator and predictive tools for the study of hydrothermal vents and in the climate change scenarios.

References

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