Occurrence of potentially pathogenic and antibiotic resistant bacteria along the Calabrian Tyrrhenian coastline

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The Calabria region is an area of considerable ecological importance that needs to be preserved from an increasing anthropogenic impact such as pollution, coastal development, and unsustainable fishing practices. The threat related to emerging pathogen and antibiotic resistant bacteria has provided a new perception of the social and economic damages deriving from potential epidemics, thus requiring a more active commitment to research (1, 2). Within the project CRIMAC Blue-(H)ealthy, the occurrence of potentially pathogenic and antibiotic resistant bacteria was investigated along the Calabrian Tyrrhenian coastline. Two sampling campaigns were carried out on a seasonal basis (winter-summer) in sand, sediment and water of three sites (Reggio Calabria, RC; Gioia Tauro, GT; Vibo Valentia, VV). The abundance of total heterotrophic bacteria and fecal pollution indicators and the profiles of antibiotic-susceptibility and enzymatic activities were investigated. First results showed higher abundance of tetracycline-resistant bacteria during winter in all abiotic matrices, accounting for 31% and 45% of the total heterotrophic bacteria in VV and GT, respectively. Differently, during summer the highest number of ciprofloxacin-resistant bacteria was observed in all matrices and sites, especially in sediment samples. In water leucine aminopeptidase and alkaline phosphatase were the main enzyme activities, increasing from winter to summer. Very high enzyme values were detected in sand, with an overall increase in summer, especially in RC. The results provide interesting insights on the microbial compartment in different matrices along the coastline, furnishing also important information for a preliminary human risk assessment.

References

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