

Mycodiversity in marine sediments contaminated by heavy metals: preliminary results

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Fungi represent the main decomposers of woody and herbaceous substrates in the marine ecosystems. To date there is a gap in the knowledge about the global diversity and distribution of fungi in marine habitats. On the basis of their biological diversity and their role in ecosystem processes, marine fungi may be considered one of the most attractive groups of organisms in modern biotechnology, e.g. ecotoxic metal bioaccumulation. Here we report the data about the first mycological survey in the metal contaminated coastal sediments of the Gromolo Bay. The latter is located in Ligurian Sea (Eastern Liguria, Italy) and is characterized by an enrichment of heavy metals due to pollution of Gromolo Torrent by acidic processes that interest Fe-Cu sulphide mine.

24 samples of marine sediments were collected along a linear plot in front of the shoreline in July 2015. Each sample was separated into three aliquot for mineralogical, chemical analyses and fungal characterization.

The sediment samples are characterised by clay fractions (illite and chlorite), minerals of ophiolitic rocks (mainly serpentine, pyroxene and plagioclase) and quartz and are enriched some chemical elements of environmental importance (such as Cu, Zn, Pb, Cd, As).

For fungal characterisation the sediment samples were inoculated in Petri dishes on different culture media (Malt Extract Agar and Rose Bengal) prepared with sea water and added with antibiotics. The inoculated dishes were incubated at 20°C in the dark for 28 days. Every week fungal growth was monitored counting the number of colonies. Later, the colonies were isolated in axenic culture for further molecular analysis. The mycodiversity evaluate on the basis of Colony Forming Units (CFU) and microfungal-morphotype characterised by macro- and micro-morphology.

Until now on the 72 Petri dishes inoculated 112 CFU of filamentous fungi were counted, among these about 50 morphotypes were characterized. The quantitative results show a mean value of 4.6 CFU per gram of sediments. The maximum value of 11 CFU g⁻¹ has been recorded in two stations (off the Sestri Levante Tombolo), while the minimum value has been recorded closer to the coast. As concern qualitative results, the most recurrent genera are *Aspergillus* and *Penicillium*.

These data confirm the occurrence of a mycobiota in these heavy metal contaminated sediments. Our preliminary results are a first contribution to the knowledge of presence of microfungi in marine sediments, and propel us to increase our research in order to find out new organisms for bioremediation purpose.