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MARINE FUNGI: A PRELIMINARY SCREENING TO DETECT NEW PROMISING STRAINS FOR BIOTECNOLOGICAL APPLICATIONS

L. Garzoli*, S. Tosi, A.M. Picco

Laboratory of Mycology, Department of Earth Science and Environment, University of Pavia, Via S. Epifanio 14, 27100 Pavia, e-mail: laura.garzoli01@gmail.com

Abstract

In the last years marine-derived fungi demonstrated to be of a great interest in biotechnological research and applications. In fact, these organisms can grow in stressful habitats, characterized by high salinity and pH, low water activity, high concentration of sodium ions and high pressure. In response to these stimuli they produce a wide range of different and structurally complex products. Marine-derived fungi are nowadays considered potential candidates to study and characterize novel enzymes, biosurfactants, polysaccharides, polyunsaturated fatty acids and other secondary metabolites. Marine-derived fungi have been widely studied for their bioactive metabolites and they have proven to be a rich and promising source of novel anticancer, antibacterial, antiplasmodial, anti-inflammatory and antiviral agents. Another interesting application field for marine-derived fungi is bioremediation. As an example, marine-derived fungi have been recently used in the treatment of paper and pulp mills, textile and dye-making industries and alcohol distilleries wastewater, thanks to their ability to produce lignin degrading enzymes. Another promising potential application of marine-derived fungi is the bioremediation of hydrocarbon contaminated substrata, such as water and soil. The tolerance of these fungi to saline conditions could facilitate their use in the bioremediation of polluted saline environments.

The main aim of this study is to detect marine-derived fungal strains potentially useful in a biotechnological perspective. The first step in this direction is the isolation and identification of promising fungal strains. Since June 2011 we collected 46 fungal *taxa* from different marine substrates collected in the Mediterranean Sea: algae, seaweed and submerged wood from several part around the Italian Peninsula. Among the isolates, we tested the tolerance to salinity stress. In fact, a recent study demonstrated that high salt stress can alter the metabolite profile of the marine derived fungus *Spicaria elegans*, thus suggesting that the regulation of salinity could be a promising way to obtain new compounds. Among the most promising *taxa*, the marine-derived *Eurotium* sp. strain is of particular interest. This strain, isolated from the Mediterranean invasive alga *Asparagopsis* sp., demonstrated a strong adaptation to saline environment: it grew better on a substrate with 5% and 10% NaCl with respect to 0%. This and the other promising strains (i.e. *Corollospora* sp., *Aspergillus niveus*, *Scolecobasidium arenarium*, *Nectria inventa*) are under investigation for their hydrocarbon degradation potential in relation to their salinity tolerance.