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E. Bovio, L. Garzoli, D. Firsova[1], G.P. Mc Cormack[2], G.C. Varese

Mycotheca Universitatis Taurinensis, Department of Life Sciences and Systems Biology, University of Turin, Viale Mattioli, 25 - 10125 Torino, Italia.
elena.bovio@unito.it
[1]Marine Biodiscovery Laboratory, School of Chemistry, National University of Ireland Galway, University Rd., Galway, Ireland.
[2]Molecular Evolution & Systematics Laboratory, Zoology, School of Natural Sciences & Ryan Institute, National University of Ireland Galway, University Rd., Galway, Ireland.

MARINE FUNGI ISOLATED FROM THE SPONGE *PACHYMATISMA JOHNSTONIA* IN THE ATLANTIC OCEAN

FUNGHI MARINI ISOLATI DALLA SPUGNA PACHYMATISMA JOHNSTONIA *NELL'OCEANO ATLANTICO*

Abstract - *Marine fungi inhabiting sponges represent an interesting group of microorganisms, whose biodiversity and ecological role is still mainly unknown. The aim of this study was the isolation and the identification of the mycobiota associated with the sponge* Pachymatisma johnstonia. *Overall, 22 taxa have been recorded. Ascomycetes were dominant. The most abundant genera were* Penicillium, Cladosporium *and* Aspergillus. *This study contributes to the general knowledge of fungal biodiversity in the oceans.*

Key-words: *fungi, sponges, biodiversity, sea water.*

Introduction - Oceans bear an almost unlimited diversity of microorganisms, and it is realistic to assume that today we know less than 0.1% of their diversity. Among these, fungi are often dominant, as they are capable of colonizing almost all types of substrate. Nevertheless, little is known about their diversity and ecological role. While they have been reported to establish biological interactions with marine invertebrates, the mechanisms involved in this coexistence are still unknown and the current challenge is the elucidation of the chemical crosstalk between fungi and the colonized organisms (Yarden, 2014). Considering the potential biodiversity of marine fungi and the large gaps in our knowledge regarding their presence and role in the oceans, this study, the first concerning the fungal biodiversity associated with the marine sponge *Pachymatisma johnstonia* (Bowerbank in Johnston, 1842) makes an important contribution.

Materials and methods - *P. johnstonia* specimens were collected in the Atlantic Ocean, along the West Coast of Ireland in Summer 2015. The specimens were surface-sterilized in 70% ethanol and washed in sterile seawater to remove external contaminants. Sponge pieces (1 cm^3) and sponge homogenates were plated on two different media mimicking natural conditions and incubated at 25 °C. Plates were checked weekly for one month. Strains belonging to each fungal morphotype were isolated in pure culture. Fungi were identified by means of a polyphasic approach combining morpho-physiological and molecular features. All the fungal isolates are preserved at the *Mycotheca Universitatis Taurinensis* (MUT).

Results - Fungi were isolated from all the *P. johnstonia* specimens resulting in a total of 22 fungal taxa recorded. Ascomycota was the dominant phylum (96% of isolates) whereas only two basidiomycetes were detected. Almost half of the isolates belonged to *Penicillium* spp. (43%), followed by *Cladosporium* spp. (25%) and *Aspergillus* spp. (11%). Overall, these three genera represented 80% of the total mycobiota.

Conclusions - This first report on the mycobiota associated with *P. johnstonia* underlines the dominance of Ascomycota species in the marine environment. Similar

to other sponges, our study confirm *Penicillium*, *Cladosporium* and *Aspergillus* as the most common genera associated with these animals (Henríquez *et al*., 2014). This study contributes to the general knowledge on microorganisms inhabiting the oceans. Since recent studies demonstrated that fungi associated with sponges could represent an outstanding source of bioactive compounds, further analyses will be performed to highlight the biotechnological and pharmaceutical potential of the isolated fungal strains.

References

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