Mychoteca Universitatis Taurinensis (MUT)

The *Mycotheca Universitatis Taurinensis* (MUT) is the fungal collection of the Department of Life Sciences and Systems Biology of the University of Torino and one of the most important banks of fungal biodiversity in Italy. MUT scopes include are acquisition, identification, characterization, preservation and distribution of both macromycetes and micromycetes. The collection operates according to the ISO 9001 standard, achieved in 2006; since 2008 MUT is affiliated to the World Federation Culture Collections (WFCC), and is a member of the European Culture Collections' Organisation (ECCO).

MUT holds more than 2000 marine fungi, isolated from a range of biotic and abiotic substrates (mainly from the Mediterranean Sea) such as algae (*Asparagopsia taxiformis*, *Flabelia petiolata* and *Padina pavonica*), seagrasses (e.g. *Posidonia oceanica*), invertebrates, sediments, plastics etc.. Many fungi have been characterized for the production of extremozymes (e.g. laccases, tannases, xylanses) active in presence of high salt concentrations, others have been screened for the presence of polyketide synthases genes (PKS), whose presence is predictive of the ability to secondary metabolites with antibacterial, antifungal and antialgal potential.

Several projects and collaborations in the field of marine mycology and biotechnological are currently ongoing.

Involvement of MUT in EMBRC

MUT, with its collection of marine fungi, will contribute to widen the expertise and knowledge of EMBRC on the biodiversity hosted in the Oceans. The number of strains, together with the great expertise of the staff in the study and valorisation of marine fungi, will be immediately available to the Consortium.

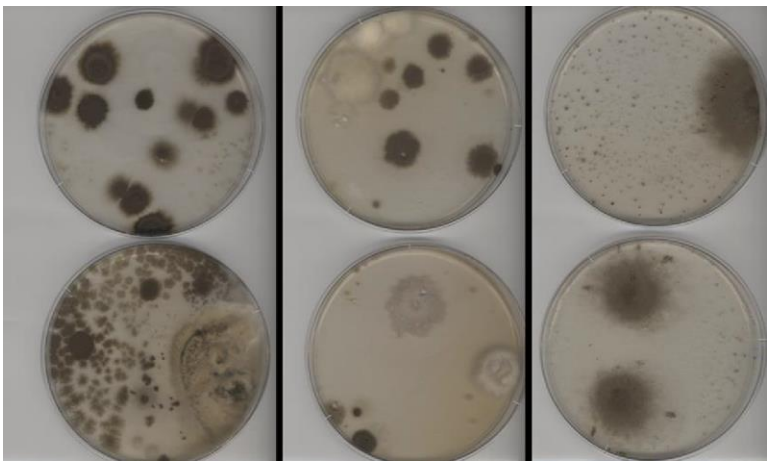
A reasonable high number of strains are representative of putative new taxa or were recently described. These organisms will be available to the Consortium and will be investigated for the production of secondary metabolites of biotechnological interest.

Furthermore, within EMBRC, MUT could provide taxonomic services on this neglected group of organisms, facilities and other skills to support innovative research.

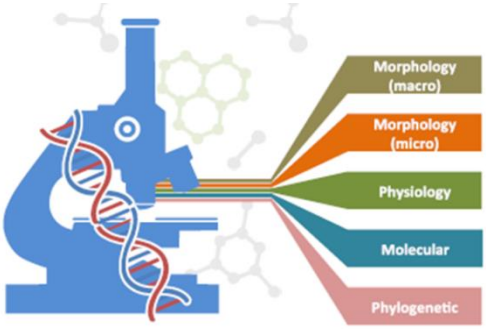
MUT will offer the following services:

- Access to fungal strains: fungi will be provided in active growth or lyophilised in compliance with national and international regulation (i.e. Nagoya protocol)

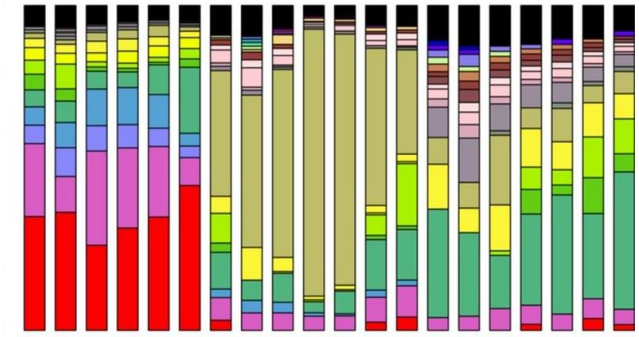
- Fungal isolation: isolation of fungi from different marine substrates. Up to 100 strains will be isolated in axenic culture.



- Fungal identification: identification of fungi in pure culture with a polyphasic approach that combines molecular and morphological analyses.

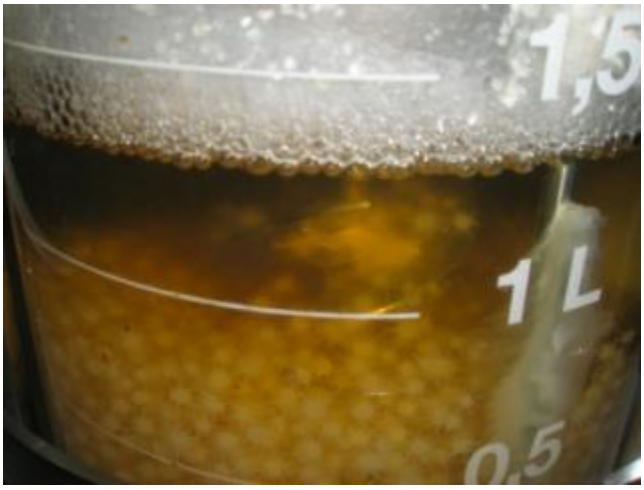


- Metabarcoding analysis: a broad description of microbial communities in an environment is essential to monitor its health prior to conservation. As an input, the service requires min. 3 max. 10 reactions. As an output, it offers Illumina amplicon sequencing for the taxonomic characterization of bacteria and fungi. The users will also obtain biodiversity measures, overview taxonomy plots and an inference of putative trophic interactions in the community.



Relative abundance

- Metagenomic analysis: metagenomic allows capturing the widest array of organisms in a sample, bypassing primer couples specificity. As an input, the service requires two samples (with 3 technical replicates each). As an output, it offers Illumina amplicon sequencing for the taxonomic characterization of bacteria and fungi. The users will also obtain biodiversity measures, overview taxonomy plots and an inference of putative trophic interactions in the community.
- Fungal WGS and annotation: genomics sequencing allows us to dig into the genetic features that support the ecology and physiology of a microorganism. The input is a fungal strain of interest, whose biomass will be produced for high molecular weight DNA extraction. The sequencing will be performed with long reads (Oxford Nanopore), and the output will include gene models, characterization of gene functions, analysis of transposable elements, secreted proteins and secondary metabolites.
- Biochemical characterization: fungi may produce bioactive molecules. The input is a strain of interest, which will be grown in optimal fermentative conditions (i.e. max 2 conditions). The biological activity of the extract will be evaluated against specific targets.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