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MULTIPLE BIOASSAYS TO EVALUATE ECOTOXICITY OF POLLUTED SUBSTRATES

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Potential ecotoxicity of three tunnel excavation materials conditioned with two different foaming conditioners (P and F, respectively) and lubricant were screened using a multi-end-point bioassay approach. A modified OECD artificial soil was used as control soil (C) to screen only the effect of each conditioner. Acute toxicity bioassays were conducted with a selected set of test species (*Dictyostelium discoideum, Daphnia magna, Hordeum vulgare* and *Lactuca sativa*). Tests were done immediately after adding conditioners (t_0), and after one (t_7) and two weeks (t_{14}) from P and F addition. Although substrates showed no toxic effect, the sensitivity of the test species and the toxicity endpoints varied. The *D. discoideum* were not affected by F exposure, showing morphology and fission rate rhythm (FRR) similar to that of C. Conversely, at t_0 P inhibits the FRR, while t_7 and t_{14} were comparable with C for cell division and morphology. The *D. magna* values of immobilization percentage (I%) were always lower than 10% (*i.e.*, comparable with C), with the exception of one substrate+P in which I=10%. The germination index of *L. sativa* and *H. vulgare* ranged around 80% (*i.e.*, no phytotoxicity) and the same trend was observed for mean root length. No significant time-effect (*i.e.*, increasing conditioner biodegradation) were recorded with the exception of one substrates, with values that turned high at t_{14}. Thus, substrates+conditioners were not toxic but with different sensitivity showed by multiple bioassays that revealed that this approach is suitable to be applied for a quick and exhaustive screening of soil toxicity.

SPONGE-ASSOCIATED ANTARCTIC BACTERIA: DIVERSITY AND BIOTECHNOLOGICAL POTENTIAL

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Sponges provide important habitat for a community of associated organisms with bacteria that frequently colonize outer surfaces as well as the interstices of ostia and oscula, constituting over 40% of the host mesohyl biomass, even in Antarctica where sponges dominate vast areas of the Antarctic shelves. Among extremophiles, cold-adapted bacteria from Polar habitats could represent a potential source of novel biomolecules with unusual functional activities. Despite this, their biotechnological potential remains relatively unexplored. In this context, a total of 884 cold-adapted bacterial strains from 12 Antarctic sponge species were identified and screened for potential biotechnological applications. Isolates were clustered in 45 Operational Taxonomic Units (OTUs) which were phylogenetic affiliated to five main taxa, as follows: Gammaproteobacteria (57.6%), Actinobacteria (19.5%), CF group of Bacteroidetes (16.9%), Alphaproteobacteria (4.8%) and Firmicutes (1.2%). The genera *Pseudoalteromonas* (342 isolates), *Arthrobacter* (124 isolates) and *Gillisia* (115 isolates) were particularly abundant among isolates. The Alphaproteobacteria and Firmicutes were mainly represented by members in the genera *Roseovarius* and *Oceanobacillus*, respectively. The OTUs *Pseudoalteromonas* SER45, *Arthrobacter* SER44 and *Psychrobacter* SER48 were generally shared among sponge species. The cluster analysis carried out on bacterial isolates highlighted similarities/differences among the bacterial community associated with the analyzed Antarctic sponges, also in relation to the sampling site. Antibacterial activity and production of exopolysaccharides (EPS) were showed by 119 and 110 isolates, respectively, mainly affiliated to the genus *Pseudoalteromonas*. Further in depth analyses were carried out for EPS iper-producing isolates belonging to the genera *Shewanella, Colwellia, Psychroserpens* and *Winogradskyella*.

MOLECULAR EPIDEMIOLOGY OF PATHOGENIC *CANDIDA* SPECIES IN HOSPITAL ENVIRONMENTS

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The rise of *Candida* bloodstream infections (BSI) among hospitalized patients is a fact widely confirmed by many studies worldwide. In Italy *C. albicans* and non-albicans species cause around 50% of BSIs each and *C. parapsilosis* has emerged as an important cause of candidemia especially in southern Italian hospitals. The aim of this study was to describe the pattern of fungi associated with hospital environments (air, medical equipment and various surfaces) in one of the most important structures of South Italy in the treatment of patients with neurological diseases. A total of 271 yeasts were recovered and identified using phenotypic and molecular methods . Most of them (58%) belonged to *Candida* species and *C. parapsilosis* was the most encountered species followed by *C. glabrata, C. albicans, C. tropicalis* and *C. krusei*. The remaining 42% of the yeast isolates belonged to different fungal Genera (*Rhodotorula, Aureobasidium, Saccharomyces e Blastoschizomyces*). This study confirms that *C. parapsilosis* is particularly prevalent in Italian hospitals where contaminates various surfaces including air and medical devices. Therefore, the implementation of surveillance and control measures is imperative to prevent the spread of nosocomial fungal infections among hospitalized patients.

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IN VITRO ACUTE TOXICITY OF CADMIUM AND ZINC IN HAEMOLYMPH AND DIGESTIVE CELLS OF *MYTILUS GALLOPROVINCIALIS*

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