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Characterization of the Microorganisms Associated with Pleurotus ostractus and Pleurotus tuber-Regium Spent Mushroom Substrate

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Abstract : Introduction: The microbial ecology of Pleurotus osteratus and Pleurotus tuber–regium spent mushroom substrate (SMS) were characterized to determine other ways of its utilization. Materials and Methods: The microbiological properties of the spent mushroom substrate were determined using standard methods. This study was carried out at the Microbiology Laboratory University of Port Harcourt, Rivers State, Nigeria. Results: Quantitative microbiological analysis revealed that Pleurotus osteratus spent mushroom substrate (POSMS) contained $7.9x10^5$ and $1.2\ x10^3$ cfu/g of total heterotrophic bacteria and total fungi count respectively while Pleurotus tuber-regium spent mushroom substrate (PTSMS) contained $1.38x10^6$ and $9.0\ x10^2$ cfu/g of total heterotrophic bacteria count and total fungi count respectively. The fungi species encountered from Pleurotus tuber-regium spent mushroom substrate (PTSMS) include Aspergillus and Cladosporum species, while Aspergillus and Penicillium species were encountered from Pleurotus osteratus spent mushroom substrate (POSMS). However, the bacteria species encountered from Pleurotus tuber-regium spent mushroom substrate include Bacillus, Acinetobacter, Alcaligenes, Actinobacter, and Pseudomonas species while Bacillus, Actinobacteria, Aeromonas, Lactobacillus and Aerococcus species were encountered from Pleurotus osteratus spent mushroom substrate (POSMS). Conclusion: Therefore based on the findings from this study, it can be concluded that spent mushroom substrate contain microorganisms that can be utilized both in bioremediation of oil-polluted soils as they contain important hydrocarbon utilizing microorganisms such as Penicillium, Aspergillus and Bacillus species and also as sources of plant growth-promoting rhizobacteria (PGPR) such as Pseudomonas and Bacillus species which can induce resistance on plants. However, further studies are recommended, especially to molecularly characterize these microorganisms.

Keywords : characterization, microorganisms, mushroom, spent substrate
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