

Screening of *Lentinula edodes* strains able to degrade polyphenols in Olive Wastewater

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Abstract

The olive waste (both solid and liquid) generated from olive industry such as Olive mill wastewater, olive cakes, leafs etc. plays a considerable role in environmental pollution. The uncontrolled disposal of this biomass is becoming a serious environmental problem. As a means of recycling, these wastes can be used as manure, but the presence of aromatic compounds, such as polyphenols makes it recalcitrant as very less species of natural microflora are able to degrade these polyphenolic substances. Sometime, these wastes when used in anaerobic treatment plants doesn't show up good results because, the anaerobic microbes were sensitive to the high concentration of polyphenols which inhibited their growth, subsequently resulting in less products. Although, many of the micro-organisms were not reported to degrade the polyphenols such as tannins, certain filamentous fungi belonging to the species *Aspergillus*, certain edible mushrooms such as Pleurotus, shiitake etc. are able to produce enzymes resulting in the degradation or biotransformation of these molecules, utilising it as sole carbon source. The Shiitake mushroom (*Lentinula edodes*), falls under the category of the second most popular edible mushroom available in the global market. Its quality as an edible mushroom is not only attributed to its nutritional value or its flavor, but also to its possible applications in medical and food industry. Also this mushroom is reported to be able to synthesize certain substances with antitumor activity, antibacterial such the lentinan. The objective of the present work, was to screen shiitake strains available in the culture collection from different areas (like China, Europe, Belgian, American, Japan, Taiwan), and to select one, able to degrade or transform polyphenols existing in olive waste. Solid-state fermentation was carried out using olive waste as substrate to check the capability of the strains to degrade polyphenols. The degradation of the polyphenols will be analysed along with enzyme activity assays and results will be discussed.

Key words: Olive cake, solid state fermentation, edible mushroom, polyphenols degradation, *Lentinula edodes*.

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