

The biodegradation of the constituents of olive fermentation wastewaters using fungal and bacterial systems.

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During the production of table olives, large quantities of olive fermentation wastewater (OFW) are produced, some 10^8 L.year⁻¹ are consumed in the process and the treatment of each kilogram of olives results in 8,5 L of wastewater (1). The wastewater is high in phenolic content (approx. 5 g/L), highly saline due to the fermentation, as well as possessing a high chemical oxygen demand (50-100 g/L). It thus constitutes a serious environmental pollution problem, especially in the Mediterranean countries, due to the phytotoxic and antimicrobial effects attributed to the high concentration of phenolic compounds (2). The dark colour that this waste possesses is a result of the abundance of polyphenolic compounds present.

In this research, fungal and bacterial systems will be investigated for their abilities to remove this phenolic fraction by taking advantage of the enzymatic systems capable of degrading these organic components. The data has shown that a reduction in phenols of up to 51%, as well as reducing COD levels as much as 40% can be achieved with the bacteria *Citrobacter amalonaticus* in a period of 96 hours. The fungus *Trametes pubescens* has shown the capacity to reduce phenols by more than 70%, but at a slower rate. A reduction in the phenolic fraction and colour of this waste could allow for its reuse as irrigation or cleaning waters.

¹Beltran-Heredia J., Torregrosa J., Dominquez J. R., Garcia. (2000) Aerobic biological treatment of black table olive washing wastewaters: effect of an ozonation stage. *Process Biochem.* 35, 1183-1190.

²Capasso R., Evidente A., Schivo L., Orru G., Marcialis M. A., Cristinzio R. (1995) Antibacterial polyphenols from olive oil mill wastewaters. *J. Appl. Bacteriol.* 79, 393-398.