



## Increase of the anaerobic biodegradability of olive mill wastewaters through a pre-treatment with hydrogen peroxide in alkaline conditions

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### ABSTRACT

Olive mill wastewaters, due to a low biodegradability, acidic pH, high salinity, lack of nutrients and elevated amounts of polyphenols, are hard to treat using conventional biological processes. In recent years, several pre-treatments of these by-products have been developed to increase their anaerobic biodegradability and to exploit them for biogas production. However, these processes are often expensive and hard to carry out. This paper presents a process, easy to manage, that involves the use of hydrogen peroxide under alkaline conditions without the addition of catalysts. This process is able to efficiently increase the anaerobic biodegradability of olive mill wastewaters. In fact, with mild treatment conditions, it is possible to obtain polyphenols abatements of 78%, increases of 48% in the volatile fatty acids content and only a restricted reduction in the organic matter content. By conducting many digestion tests, it was verified that this process permits high biogas production by olive oil by-products. Indeed, with properly prepared samples, after a negligible acclimation period, methane yields of approximately 0.37 LCH<sub>4</sub>/gCOD<sub>removed</sub> were detected.

*Keywords:* Anaerobic digestion; Biogas; Hydrogen peroxide; Olive mill wastewaters

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