



# Isolation and Identification of *Magnusiomyces capitatus* as a Lipase-Producing Yeast from Olive Mill Wastewater

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## Abstract

Olive mill wastewaters (OMW) are effluents originated from olive oil extraction. As an oil-rich residue, OMW is a potential source of lipase-producing microorganisms and a complex medium potentially suitable for lipase production. The aim of the present study was to isolate yeasts with the ability to produce extracellular lipases from OMW. Thirty-two yeast isolates were obtained and screening for esterase/lipase activity using rapid plate detection methods allowed the selection of five isolates. Subsequently, extracellular lipolytic activity was determined in shake-flasks, and the best activity was found in the isolate JT5 (0.85 U/mL). This isolate was identified as *Magnusiomyces capitatus* by DNA sequencing. Growth and lipolytic activities by *M. capitatus* JT5 were assessed in undiluted OMW, and optimization of lipase production was achieved by a positive interaction of two factors (oxygen availability and nitrogen concentration). The highest lipase activity (1.4 U/mL) was obtained at  $\text{NH}_4\text{Cl}$  concentration of 2.8 g/L and  $k_L a$  of  $0.65 \text{ min}^{-1}$ . The growth of *M. capitatus* JT5 in a stirred tank bioreactor, using undiluted OMW, allowed the improvement of lipase production (up to 3.96 U/mL) by increasing olive oil concentration in the medium, under the selected conditions of nitrogen concentration and oxygen availability. This study highlighted the isolate *M. capitatus* JT5 as a lipase-producing microorganism that is able to grow in undiluted OMW under controlled conditions. Results obtained in shake-flasks have been reproduced satisfactorily in the stirred tank bioreactor.

## Graphic Abstract

