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Use of olive pomace treated by ultrasounds as substrate for cellulases and xylanases production.

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The reutilization of biological wastes is of great interest since, due to legislation and environmental reasons. Moreover, the use of these wastes considerably reduces the production costs. Olive oil production is the most common food processing activities in the countries of southern Europe. Environmental pollution posed by olive mill wastes (OMW) is a growing problem especially in the Mediterranean region. Research into finding new uses for wastes from olive oil will allow obtaining not only economic benefits, but also to the environment in areas where industries are located.

The two-phase system is a recent process that allows the production of olive oil with economic and environmental benefits and produces a semi-solid waste, termed two-phase olive mill waste or olive pomace. Generally, the residual oil from this waste is recovered and the solid is dried to use in combustion processes. In this work, we searched other alternatives as its use as solid substrate in solid-state fermentation for cellulase and xylanase production

To improve the production of enzymes, the treatment of olive pomace by ultrasounds was evaluated. In a previously work, it was optimized the sonication time and liquid solid ratio. After treatment, solid fraction was separated from the liquid fraction and used as solid substrate in SSF by *Aspergillus niger*. The xylanase production was improved by treatment, however the cellulase production decreased. In the present study, it was evaluated the use of liquid fraction from ultrasounds treatment to adjust the moisture of solid fraction. In this way, all fractions from ultrasounds treatment were used.

The addition of liquid fraction to solid pretreated showed a positive effect in xylanase and cellulase production by SSF. This liquid is rich in free sugars that can induce the enzymes production. This study clearly improved the production of cellulases and xylanases under SSF of olive pomace. The xylanase production was increased from 28 (initial SSF) to 100 U/ g and the cellulase production 38 U/g (initial SSF) to 46 U/g. This friendly environment treatment was a suitable process to enhance the valorisation of olive mill wastes by improving the enzyme production.