

## Screening of *Geotrichum* Species from the Culture Collection URM for the Production of Lipases

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### Abstract:

The high industrial demand for new sources of lipases with different characteristics has stimulated the searching of new strains of lipolytic micro-organisms, mainly fungi, as well as searching for new sources of carbon with the aim of optimize the production of lipases using substrate of low commercial value. The objectives of that work were to detect and produces lipases using as substrate olive and mamona oil in cultures of *Geotrichum* maintained in the Culture Collection URM; to select the best producer, check the best conditions for enzyme production and determine the effect and stability of lipases against pH and temperature. The cultures reactivation and certification were made through the morphophysiological characteristics. The detection of lipases was made using Tween 20 as substrate. In the fermentation were used olive and castor oil as carbon sources according to standardized methodology. To determine the best conditions of production was made a complete factorial planning (24) with parameters of temperature, pH, castor oil and yeast extract concentrations. The enzyme was partially characterized by optimum pH and temperature and pH and temperature stability. Of the 18 strains preserved into mineral oil for 3 to 55 years, 14 remained viable and were authenticated. In the selection of lipase producer only the strain of *G. candidum* URM3135 was able to present to 3.2 mm halo of degradation. However in submerged in culture fermentation with olive and castor oil, all of the cultures produced lipases with activities that varied from 2.78 to 5.55 U/mL and 3.82 to 6, 95 U/mL respectively. *G. versiforme* URM887 presented a good performance with lipolytic activity of 6.95 U/ml in castor oil, after 96 hours of fermentation being selected for production and partial characterization. After the enzyme production in different conditions, the maximum lipase activity was 12.25 U/mL in 72 hours of fermentation using 0.5% of castor oil, 0.7% yeast extract at 40°C. The lipase presented optimum activity in pH 5.4 at 70°C and stability in the pH range of 5.0 to 5.4 at 30 to 90°C. *Geotrichum* strains were stored under mineral oil in culture collections for long periods are able to maintain the physical and physiological features. *G. versiforme* is a promising specie to produce lipases with potential for application in industrial scale.

**Key words:** Lipases, *Geotrichum*, Culture Collection URM, Biotechnology Application, mamona oil