

## PRODUCTION OF $\gamma$ -DECALACTONE BY YEASTS VIA CASTOR OIL BIOTRANSFORMATION

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Lactones are compounds with sensory properties of great interest for food industries. Among lactones,  $\gamma$ -decalactone is the most used and it has a fruity peach aroma. In most biotechnological processes, castor oil, ricinoleic acid or its esters are used as a substrate for the synthesis of  $\gamma$ -decalactone by microorganisms. This compound is synthesized by microbial biotransformation on the peroxisomal  $\beta$ -oxidation pathway. The objective of this study was to evaluate the production of yeast  $\gamma$ -decalactone using castor oil as substrate and their growth during biotransformation process. Yeasts *Yarrowia lipolytica* CCMA 0242, *Yarrowia lipolytica* CCMA 0357 and *Lindnera saturnus* CCMA 0243 were used and obtained from Lavras Federal University- Agriculture Microbiology Culture Collection (Coleção de Culturas da Microbiologia Agrícola- CCMA). These yeasts were reactivated in liquid YEPG medium and stored at 28°C/ 48 hours. Following, 10% of initial inoculum was transferred to a bigger volume until reaching 200 ml and incubated at 28 °C/ 150 rpm for 18h. All content was centrifuged at 4 °C/ 6000 rpm for 5 min, cells were washed three times with sterile water and added in YNB medium with 30% castor oil, incubated at 29 °C/ 200 rpm for 120h, pH 5.0. Quantification of viable cells was done with a Neubauer chamber, using methylene blue, to evaluate cell viability. The  $\gamma$ -decalactone produced during fermentation was extracted with diethyl ether and quantified by gas chromatography using a flame ionization detector (GC-FID). Yeast species differed in  $\gamma$ -decalactone production ( $P < 0.05$ ). Production of yeast *L. saturnus* CCMA 0243 (234.3 mg/L) was 2.4 times greater than yeast *Y. lipolytica* CCMA 0242 (96.7 mg/L). Aroma production by *Y. lipolytica* strain CCMA 0357 was not detected, however, this yeast used castor oil as a carbon source for growth. Yeast *L. saturnus* CCMA 0243 population reached the stationary phase after 24 hours, *Y. lipolytica* CCMA 0242 and *Y. lipolytica* CCMA 0357 after 96 hours of incubation. Cells remained viable during all the cultivation time. Under evaluated conditions, yeasts demonstrated their ability to grow on medium with castor oil as substrate during cultivation, particularly, *L. saturnus* CCMA 0243 showed a high production of  $\gamma$ -decalactone.

**Key words:** Castor oil, Lactone, Yeasts

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