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Strategies for increasing aroma production by *Yarrowia lipolytica*: hydrolysis of substrate and cell immobilization

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Y-Decalactoneis a peach-like aroma compound well known in several food and beverages, reason why the food industry has a high interest in its biotechnological production. One of the better known applications is the biotransformation of ricinoleic acid into Y-decalactone, catalysed by yeasts with GRAS status, like *Yarrowia lipolytica*, since in this case a natural label is conferred to the aroma, which is very important, considering the increasing health- and nutrition-conscious lifestyles. However, for the different processes of aroma production described in the literature, a low yield of Y-decalactone is obtained. An alternative production technique should be considered to improve aroma production. The immobilization of viable cells for use in the biotransformation process is an approach of great interest since, as compared with free cells, immobilized cells exhibit a higher tolerance to toxic compounds (such as the aroma itself) and higher productivity. Moreover, in other to increase the availability of the substrate (castor oil) to the cells for the Y-decalactone production, hydrolyzed castor oil can be used. This hydrolysis can be promoted by enzymatic action, more specifically by extracellular lipase (Lipozyme TL IM).The main purpose of this work is study some strategies for increasing Y-decalactone production, namely the cell immobilization in calcium alginate and integrating an enzymatic hydrolysis of castor oil in the process, using a commercial lipase. Cells were immobilized in 3% (w/v) sodium alginate solution and the extracelular enzyme Lipozyme TL IM was used for castor oil hydrolysis. The use of hydrolyzed castor oil in the aroma production decreased the lag phase for Y-decalactone secretion and the immobilized cells exhibit more tolerance for toxic compounds than free cells and enhanced fermentation productivity.