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<b>Abstract title</b>	PRODUCTION OF CITRIC ACID FROM GLYCEROL BY YARROWIA LIPOLYTICA – OPTIMIZATION OF CULTURE CONDITIONS
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The global expansion of biodiesel production turned the glycerol (the main byproduct of this industry) into an excess product, consequently available at low cost on the market. Despite the well-known applications of pure glycerol, it is important to look for new ways to valorize the raw glycerol; it can be through biotechnological alternatives, by its use to produce high added value compounds. Several microorganisms are able to use glycerol and convert it into different compounds. *Yarrowia lipolytica* is the non-conventional yeast more extensively studied; it is not pathogenic to humans and was classified as GRAS by FDA to produce citric acid. This yeast can use several different carbon sources like glucose, glycerol, alcohols, acetate and hydrophobic substrates as fatty acids or alkanes, moreover it can produce important metabolites having an intense secretory activity. Citric acid is one of these metabolites that this yeast can produce and secrete. The citric acid is an intermediate of the tricarboxylic acid cycle, that are used as a food ingredient and used in the production of wines, jams, cheese, ice creams, kellites and ciders, is also used in the pharmaceutical industry and recently in the manufacture of detergent. Most of citric acid has been produced by *Aspergillus niger* in submerged fermentation, but because of the constant increased of the amount of citric acid needed is important to find alternative processes and the use of high-yield yeast could be this alternative. The production of citric acid by *Y. lipolytica* is influenced by the culture conditions: the carbon source and its concentration, the concentration of nitrogen, pH value and others factors that change the metabolism to produce other organic acids instead of citric acid.

The principal aim of this work was to select the better conditions to stimulate and maximize the production of citric acid by *Yarrowia lipolytica* W29 (ATCC20460:CLIB89).

Using the Taguchi method through the experimental design software (Qualitek-4), the influence of carbon/nitrogen ration (C/N), the pH, quantity of salts and the aeration in the production of citric acid was evaluated. These four factors were varied at three different levels resulting in a total of 9 experiments that were preformed in flasks.

The optimal conditions to maximize the concentration of citric acid (9.6 g/L) were a C/N ratio of 50/0.1, a pH of 5, presence of salts at middle concentration and aeration of 200 rpm in flasks with baffles. The optimum conditions were validated in flasks and in 2 L bioreactor operating either with pure or crude glycerol.

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