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**Biosynthesis of pyruvic acid from glycerol-containing substrates
and its regulation in the yeast *Yarrowia lipolytica***

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Abstract

The ability of different yeasts to synthesize pyruvic acid (PA) from glycerol-containing substrates has been studied. The selected strain *Yarrowia lipolytica* VKM Y-2378 synthesized PA with α -ketoglutaric acid (KGA) as a byproduct. The content of KGA greatly depended on cultivation conditions. The minimal formation of the byproduct was provided by the limitation of yeast growth by thiamine (0.6 μ g/g biomass); the use of ammonium sulfate (0.6%) as a nitrogen source; addition of glycerol to cultivation medium in 20 g/L portions; maintaining the cultivation temperature at 28°C, pH of the cultivation medium at 4.5, and medium aeration between 55 and 60% of saturation; the optimal cultivation time was 48 h. The selected strain cultivated under such conditions in a fermenter with a waste glycerol from biodiesel production process synthesized 41 g/L PA with a yield of 0.82 g/g. The mechanism of PA production from glycerol-containing substrates in *Y. lipolytica* is discussed.

Keywords:

pyruvic acid (PA) production; *Yarrowia lipolytica*; waste glycerol from biodiesel
production process; optimization

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