

TITLE: *Corynebacterium glutamicum* growth in sugarcane ethanol vinasse

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ABSTRACT: *Corynebacterium glutamicum* is a very important microorganism in industrial bioprocesses, such as amino acids and organic acids production. This study aimed to evaluate the *C. glutamicum* cellular growth in sugarcane ethanol vinasse, a residue from ethanol production. In order to do so, we employed an ethionine-resistant strain, obtained after strain ATCC 13032 was submitted to UV radiation. The mutated strain was submitted to two different culture media: i) a defined culture medium, referred as F1, previously studied by other authors; ii) a mixture of F1 medium with vinasse (1:1), referred as mixed medium. Carbon (sucrose 50 g L⁻¹) and nitrogen (urea 10 g L⁻¹) sources were kept in the same concentration for both media. The experiment was carried out in shaker flasks, at 30°C, 180 rpm and initial pH between 6,8 and 7,5, which was adjusted with NH₄OH 4 N. Processes were monitored by pH, optical density (OD₆₀₀), sugars (sucrose, glucose and fructose), acetate, lactate and glycerol concentrations. Processes were carried out for 42 h, with samples collection every six hours. In F1 medium we observed decreasing cellular growth at 36 h, whereas in mixed medium the same was observed at 42 h. Both media had very low concentrations of residual sugars after 42 h: 1.60 g L⁻¹ in F1 medium and 0.42 g L⁻¹ in mixed medium. No acetate was detected in any of the samples, however, lactate was detected at 42 h in important concentration: 18.03 g L⁻¹ in F1 medium and 17.72 g L⁻¹ in mixed medium. Lactate production by *C. glutamicum* is strongly related to O₂ limitation in culture media rich in glucose and minerals. *C. glutamicum* is capable of consuming glycerol from environment and employ it as an osmoprotectant in hyperosmotic environments. Such behavior was observed in the mixed medium, but not in F1 media. That was already expected, since sugarcane vinasse has very high concentration of several salts. Our results show that *C. glutamicum* has an interesting potential for growing in culture medium with vinasse, what might be very interesting for further studies about vinasse application as a nutrient source for other bioprocesses.

Keywords: amino acids; bioprocesses; agroindustrial wastes.

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