UTILIZATION OF AGROINDUSTRIAL WASTES FOR LACTIC L(+) ACID PRODUCTION

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Introduction. Agricultural industry wastes represent one renewable organic material with high content in cellulose, hemicellulose, starch or lactose, which are generally not exploited. Many of these wastes are dumped to effluents and soil generating pollution problems (1). For this reason, the possibility of adding value to these wastes, by using them as carbon and energy sources in fermentation processes for the production of metabolites of industrial interest, have been evaluated. In this way, it is possible to reduce the environmental impact of organic wastes, and decrease the costs of biotechnological production due to the low prices that have this type of wastes (2).

The aim of this study is to evaluate the use of hydrolysate from agroindustrial wastes as sawdust (Saw), calyx of Physalis (Cal) and cellulose (Cel) for lactic acid production by submerged fermentation process using *Rhizopus oryzae* NRRL 395 microorganism.

Methods. Agroindustrial residues were subjected to acid hydrolysis with H_2SO_4 to release fermentable sugars. The fungus *Rhizopus oryzae* NRRL 395 was subcultured on PDA agar to obtain spores. Subsequently, these spores were inoculated in a preculture medium, where the fungus grew for 24 hours. Finally the organism was passed to production medium. The carbon and energy source in the medium varies depending on the substrate. Trials were conducted at shake flask level.

Results. The hydrolysis yield based on dry weight lost for action of the acid was 28.47%, 37.17%, 13.12% for Saw, Cal and Cel respectively. Figure 1 shows the production of lactic acid with different agroindustrial substrates and a sucrose (Sa) mixture with each residue to assess its initiator effect.

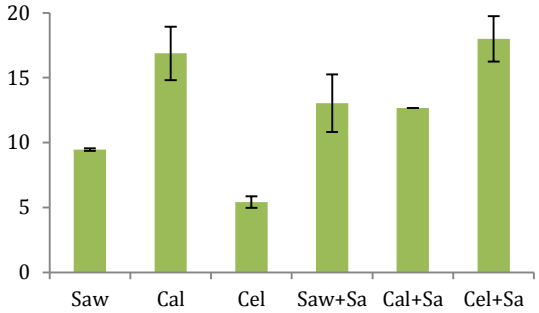

Fig.1 Production of lactic acid (g L^{-1}) with different agroindustrial waste and sucrose as initiator of fermentation.

Figure 2 shows the product/substrate yield (Yp/s, g g^{-1}) generated by lactic acid fermentation from the residues.

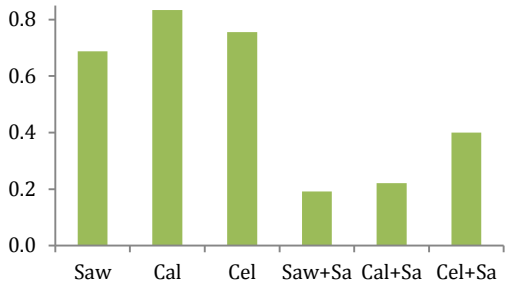

Fig. 2 Yp/s from different agroindustrial wastes and sucrose as initiator of fermentation.

Conclusion. *Rhizopus oryzae* NRRL 395 is a fungi able to produce acid lactic from agroindustrial wastes hydrolysates presenting good yields of conversion of substrate. The use of sucrose as initiator sugar decreased significantly the yields in the production of lactic acid.

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