EFFECTS OF TEMPERATURE, PH AND GLUCOSE CONCENTRATION ON BIOETHANOL PRODUCTION BY MUCOR INDICUS

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Background: Mucor indicus has recently been presented as an ethanol producing microorganism, particularly from lignocellulosic hydrolyzates [1]. The fungus can efficiently produce ethanol from different hexoses as well as pentoses under aerobic and anaerobic conditions with different morphologies [2].

Objectives: To investigate the effects of temperature (30-38°C), pH (4.5-5.5) and glucose concentration (25-100 g/L) on bioethanol and other metabolites production by Mucor indicus.

Methods:

- Mucor indicus CCUG 22424 cultivated in shake flasks and the metabolites were analyzed by HPLC.
- Taguchi experimental design method has been used in order to reduce the number of experiments and also to see the effects of interaction of the parameters.

Results:

- The results showed the ability of the fungus in production of ethanol in all the experiments with yields between 0.11-0.43 g/g. The highest yield of ethanol obtained at 30°C, pH=5.5, and 100 g/L glucose concentration.
- In all conditions, the glycerol appeared in the fermentation media with relatively high yields (between 0.01 to 0.09 g/g), while the concentrations of other metabolites such as lactic, succinic, pyruvic acid were ignorable.

Conclusions: The results indicated the high impact of temperature on ethanol production by M. indicus. The pH between 4.5 to 5.5 and glucose concentration between 25 to 100 g/l does not show significant effects on ethanol yields. Whoever, the glucose concentration showed significant effects on glycerol production.

References:
