STUDIES ON THE GROWTH AND FERMENTATION OF SACCHAROMYCES CEREVICIAE IN ALTERED MICROENVIRONMENT

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The optimum temperature for growth and ethanol production by Saccharomyces cereviciae was 40° C nad 35° C respectively. The optimum pH for growth and fermentation was 4.5. The growth was increased with increase in glucose concentration and maximum ethanol was produced when the glucose concentration was 80g/l. Maximum yield of ethanol was obtained at 60g/l of glucose. Growth of glucose. Growth of Saccharomyces cereviciae in the media containing polythylene glycol (PEG) was reduced and the inhibition of growth increased at higher PEG concentrations. PEG 8 000 had less influence than PEG 20 000 and PEG 1 540 on growth. However, medium containing PEG 20 000 gave the lowest cell density. The glucose consumption was faster in cases where PEG preparations were used than in the control medium and highest glucose consumption was observed with 5% PEG 20 000. Saccharomyces cereviciae was grown in a fermentor under the 4 following conditions.

i. Control, fermentation without PEG 20,000, normal innoculum
ii. Medium containing 5% PEG 20,000, normal innoculum.
iii. As in II, but with the innoculum grown in 5% PEG 20,000
iv. As in II, under aerobic condition.

Cell mass and growth rate were more in the control (I) whereas the cell growth was delayed in all other three PEG containing media. Almost no differene was observed between the growth in II and III. The growth was faster when aerated (IV). Dry weight and viable cell count were less in the media containing PEG but glucose was completely consumed and higher ethanol yield was obtained. The alcohol dehydrogenase activity was increased in PEG containing media by a factor of 2 (II) and in the experiment where an innoculum grown in PEG 20,000, the activity level increased by a factor of 4 (III).