

C727028. MAJOR BIOTECHNOLOGY

KEY WORD: CITRIC ACID /HYDROLYSED CASSAVA PULP /*Candida oleophila*

SINEENAT JEAMANUKULKIT : PRODUCTION OF CITRIC ACID BY *Candida oleophila* NN-39 FROM HYDROLYSATE OF CASSAVA PULP. THESIS AVISOR: ASSO.PROF. NALINE NILUBOL, Ph.D. THESIS CO-ADVISOR: ASSO.PROF. PAIROH PINPHANICHAKARN, Ph.D. AND ASST.PROF. SURAPONG NAVANKASATTUSAS, Ph.D. 97 pp. ISBN 974-635-405-1

The starch content of cassava pulp was found to be approximately 50% dry basis. It is therefore, highly probable to further process the cassava pulp to obtain sugar syrup for carbon source in fermentation industries. This research explored the application of the sugar syrup, obtained from the acid hydrolysed cassava pulp, for citric acid production by fermentation using *Candida oleophila* NN-39. The impurity in sugar syrup from hydrolysed cassava pulp reduced productivity of the citric acid production. The relevant impurity may be chemical components of cassava pulp which may be partially leached with water or derivatives from sugar syrup preparation namely acid hydrolysis of the cassava pulp and subsequent neutralisation with alkaline. Production medium with concentration of sodium chloride over 0.04 M, sodium sulfate over 0.01 M, or calcium chloride over 0.06 M decreased the citric acid productivity. Soluble calcium sulfate, however, had no effect on citric acid productivity. Dark brown sugar syrup with 420 nm optical absorbance above 1.940 would decrease citric acid productivity. The sugar syrup was therefore prepared by hydrolysing water washed cassava pulp with sulfuric acid, and subsequently neutralised with calcium carbonate. Insoluble calcium sulfate was eliminated by filtration. The filtrate was decolorized by treating with activated carbon giving sugar syrup with optical absorbance at 420 nm below 1.940. Citric acid production in 5 liter fermenter using the sugar syrup as a carbon source gave citric acid of 151.49 g/l and 162.32 g/l with the yield ($Y_{P/S}$) of 0.75 and 0.71 over fermentation period of 96 hrs and 120 hrs, respectively. The initial glucose concentration of the medium was 100 g/l and the concentration was then maintained at 50 g/l throughout the process by continuous adding the concentrated glucose syrup until 220 g/l of total glucose provision was attained. The fermentation broth was also relatively less viscous.

ภาควิชา.....

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