

Siriwan Numsomboon 2008: Alcohol Production from Mixture of Wastewater Sludge and Agricultural Residues. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Assistant Professor Pathra Pengthamkeerati, Ph.D. 79 pages.

This study investigated the potential of cassava pulp residues as carbon source and wastewater sludge as nutrient source for amylase and ethanol production. The study was composed of three parts: (1) amylase production from cassava pulp residues and wastewater sludge, (2) enzymatic hydrolysis of cassava pulp residues by produced amylase for fermentable sugar, and (3) ethanol production from sugar derived from cassava pulp residues by yeast. The result showed that *Aspergillus oryzae* TISTR 3605 was chosen for further study due to its high potential for amylase production in quantity and production period. The appropriate ratio of cassava pulp and sludge as substrates for amylase production was at 3:2 (w/w). The optimum condition for amylase production was at the moisture content of 60% using 1 ml inoculum and maximum amylase production was obtained after 48 h incubation at 35 °C. The influence of supplementary carbon suggested that glucose slightly increased the amylase production. But for nitrogen sources, peptone and ammonium sulfate decreased amylase production. It was found that the maximum reducing sugar was 5.76 g/l when using the cassava pulp residues-to-amylase ratio of 5:133 (g/unit) and 48 h of incubation. After fermenting sugar by *Kluyveromyces marxianus*, the ethanol was produced and achieved a maximum of 0.9 % (w/v) after 96 h of incubation. Overall, cassava pulp residues and wastewater sludge can be served as a low cost, alternative substrate for enzyme and energy production.

Siriwan Numsomboon

Student's signature

Pathra P.

Thesis Advisor's signature

28 / 05 / 08