ABSTRACT

Water hyacinth contains high quantity of biomass which can be digested by microorganism anaerobically to produce methane. Water hyacinth biomass from wastewater treatment facility of thread dying textile industry is usually disposed of without further treatment.

This research was aimed to determine whether methane could be produced by anaerobic process using the above mentioned water hyacinth waste.

Variations which were used in this research included: 1) COD concentrations, 2) cow manure and terrestrial snail intestines as biostarters, and 3) acid hydrolysis for breaking cellulosic material in the biomass. The amount of cow manure addition, which was applied in the bioreactor, was 50 g/50 g biomass.

Results of this research showed that water hyacinth bioreactor with COD = 31,311 mg/L and BOD 23,358 mg/L, and that of COD = 23,800 mg/L and BOD 19,725 mg/L didn’t produce methane at all. Bioreactor which applied cow manure and snail intestines of 1.25 g didn’t produce methane either. Water hyacinth bioreactor with COD = 21,520 mg/L and BOD = 14,234 mg/L, which was pretreated with acid hydrolysis could produce methane only 7 mL CH₄/50 g biomass. Water hyacinth
bioreactor with COD = 23,752 mg/L and BOD 22,389 mg/L, which applied acid hydrolysis and cow manure of 1.25 g could produce 17 mL CH₄/50 g biomass.

Maximum methane production of 1,003 mL CH₄/50 g biomass was observed in water hyacinth bioreactor with COD of 85,634 mg/L and cow manure of 50 g/50 g biomass.

Key word: biomass, water hyacinth, methane gas, anaerobic digestion