

Enhanced volatile fatty acid production from sago hampas by *Clostridium beijerinckii* SR1 for bioelectricity generation using microbial fuel cells

ABSTRACT

Sago hampas is a starch-based biomass from sago processing industries consisted of 58% remaining starch. This study has demonstrated the bioconversion of sago hampas to volatile fatty acids (VFAs) by *Clostridium beijerinckii* SR1 via anaerobic digestion. Higher total VFAs were obtained from sago hampas (5.04 g/L and 0.287 g/g) as compared to commercial starch (5.94 g/L and 0.318 g/g). The physical factors have been investigated for the enhancement of VFAs production using onefactor-at-a-time (OFAT). The optimum condition; 3% substrate concentration, 3 g/L of yeast extract concentration and 2 g/L of ammonium nitrate enhanced the production of VFAs by 52.6%, resulted the total VFAs produced is 7.69 g/L with the VFAs yield of 0.451 g/g. VFAs hydrolysate produced successfully generated 273.4 mV of open voltage circuit and 61.5 mW/m² of power density in microbial fuel cells. It was suggested that sago hampas provide as an alternative carbon feedstock for bioelectricity generation.

Keyword: Sago hampas; *Clostridium beijerinckii* SR1; Volatile fatty acids; Microbial fuel cells; Bioelectricity generation