POTENTIAL OF SAGO FOR COMMERCIAL PRODUCTION OF SUGARS

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ABSTRACT

This presentation reviews previous research works and publications, and regales the accumulated knowledge on the conversion of sago starch and sago hampas into sago sugar. Previous works have focused on the fermentation of this sugar into either lactic acid or bioethanol under various parameters and approximation for commercial scale process. This report however, details on the renewed interest into a very much lower capital and less technical process of producing sago sugars (liquid and crystallised). It also befits the level of technology widely available in absence of huge capitals to initiate the project at pre-commercial level. Sago starch can be enzymatically hydrolysed into sugar with total (100%) recovery and the syrup purified using powdered activated charcoal to remove all impurities and colour. Scaling up the process (up to 10kg) did not significantly reduce the sugar recovery during hydrolysis. Apart from sago starch, lab-scale hydrolysis of treated sago hampas can generate up to 40 to 80% sugar, which not only will create extra income for the sago mill operators, but will concomitantly reduce environmental pollution frequently associated with the sago industries. Sago sugar contains mostly glucose (94%), with maltose and other impurities, both at 3% each. Drying of the purified sago syrup is best performed using an oven (minimum 60^{o}C), producing high (100%) recovery albeit after several days. Analysis of sweetness revealed that the purified sago sugar is as sweet as 50% glucose. Sago starch therefore has a potential to be the alternative raw material to complement the frequent shortages of sugar supplied by processing imported sugar cane in this country.

Keywords : sago starch, sago fibre, enzymatic hydrolysis, sugar, glucose.

INTRODUCTION

Sago palm (*Metroxylon sagu*), which can be found scattered in South East Asia is a palm species that has been recognized as a food commodity for this region. The palm is able to thrive in swampy areas or peat soils and grows naturally without the need for pesticide and herbicide (Pei-Lang *et al*., 2006). The palm is well adapted to the tropical areas with an average temperature of 25°C and approximate humidity of 70%. Low salt concentration in the soil and exposure to light above 800*K*/cm^2 per day is preferred for maximum growth (Singhal *et al*., 2008).

In Sarawak, where over 90% of the sago palm is cultivated, the production of sago starch was reported to be approximately at 15-25tons/ha, comparable to estimation as reported elsewhere (Ishizaki, 1997). In order to sustain the systematical exploration of sago resource along with providing sufficient amount of sago palm for increasing demand of sago starch in the global market, the state government of Sarawak has launched two large plantations located at Dalat and Mukah districts at a total of 30,000ha (Singhal *et al*., 2008). Due to the many potentials of sago palm derived products, the demand for starch for both local and