

## **Starch extracted from pineapple *Ananas comosus* plant stem as a source for amino acids production**

### **ABSTRACT**

Background: Pineapple plant (*Ananas comosus*) is one of the largest productions in Asia and its increasing production has generated a huge amount of pineapple wastes. Pineapple plant stem is made up of high concentration of starch which can potentially be converted into value-added products, including amino acids. Due to the increasing demand in animal feed grade amino acids, especially for methionine and lysine, the utilisation of cheap and renewable source is deemed to be an essential approach. This study aimed to produce amino acids from pineapple plant stem hydrolysates through microbial fermentation by *Pediococcus acidilactici* Kp10. Dextrozyme was used for hydrolysis of starch and Celluclast 1.5 L for saccharification of cellulosic materials in pineapple plant stem. Results: The hydrolysates obtained were used in the fermentation to produce methionine and lysine. Pineapple plant stem showed high starch content of 77.78%. Lignocellulosic composition of pineapple plant stem consisted of 46.15% hemicellulose, 31.86% cellulose, and 18.60% lignin. Saccharification of alkaline-treated pineapple plant stem gave lower reducing sugars of 13.28 g/L as compared to untreated, where 18.56 g/L reducing sugars obtained. Therefore, the untreated pineapple plant stem was selected for further process. Starch hydrolysis produced 57.57 g/L reducing sugar (100% hydrolysis yield) and saccharification of cellulosic materials produced 24.67 g/L reducing sugars (56.93% hydrolysis yield). The starch-based and cellulosic-based of pineapple plant stem were subjected as carbon source in methionine and lysine production by *P. acidilactici* Kp10. Conclusions: In conclusion, higher methionine and lysine production were produced from starch-based hydrolysis (40.25 mg/L and 0.97 g/L, respectively) as compared to cellulosic-based saccharification (37.31 mg/L and 0.84 g/L, respectively) of pineapple plant stem.

**Keyword:** Pineapple plant; Stem; Starch; Amino acids; Methionine, Lysine