Indigenous technology of tapping, collecting and processing of coconut (Cocos Nucifera) sap and its quality in Blitar Regency, East Java, Indonesia

1Somawiharja, Y., 1*Wonohadidjojo, D.M, 2Kartikawati, M., 2Suniati, F.R.T. and 2Purnomo, H.

1Department of Informatics. Ciputra University, Indonesia
2Department of Food Technology, Ciputra University, Surabaya, Indonesia

Abstract

Coconut sugar is widely used in Indonesian and other Asian countries cuisine for centuries and also very popular as a natural sweetener in Indonesia, and nowadays it is also becoming popular as a sweetener in some developed countries. This product is still produced in cottage level with a wide quality level and this study tried to investigate the indigenous technology of tapping, collecting and processing coconut sap in Kemloko Village, Blitar Regency and the sugar components of either fresh coconut sap without and with preservative as a raw material in producing coconut sugar. The HPLC analysis of sugar components of samples showed that the fresh coconut sap without preservative start undergoes fermentation as its sucrose content decreasing while its fructose and glucose contents were increased compared to the one with preservative. On the contrary, the sucrose component of coconut sugar prepared using fresh coconut sap without preservative were lower while its fructose and glucose contents were higher compared to the one prepared using fresh coconut sap with preservative. It can be concluded that the indigenous technique of tapping, collecting and processing fresh coconut sap in this area affected the quality of coconut sugar. Therefore, an investigation of better and safer tapping, collecting and processing techniques are crucial needed to improve the coconut sugar quality.

1. Introduction

Coconut sugar as one of sweetener which has a lower glycemic index (GI) compared to cane sugar becoming popular nowadays in developed countries as reported by Solanki (2016). Trinidad et al. (2010) observed that coconut sap sugar has a GI in the range of 35±4 and 42±4. Furthermore, Solanki (2016) also noted that the demand for palm sugar in European countries within the last five years is very high.

Fresh sap from palm trees including coconut (Cocos nucifera) tree is the raw material in producing palm or coconut sugars. In Indonesia, this sap is known as nira and in other countries coconut fresh sap has its own name such as toddy (Sri Lanka), maprau (Thailand), tori (India), lagbi (North Africa) and lubki (Egypt). This fresh sap is collected from cutting the inflorescence of palm trees and contained sucrose, glucose and fructose as well as other nutrients such as minerals, vitamins, antioxidants and phytochemicals (Nathanael, 1970; Purnomo, 1992; Purnomo and Mufida, 2004; Purnomo, 2007; Hebbar et al., 2015).

According to Kusumah (1992), Purnomo (1992) and Purnomo and Surjoseputro (2001), in Indonesia coconut fresh sap are collected by climbing about 15-17 m height of coconut tree to cut the inflorescence. The collecting container is tied up on the spadix inflorescence after cutting it and left about 9-12 hours. If preservative is not added to the collecting container, the collected fresh sap could easily have fermented after 15 hours. While Purnomo and Surjoseputro (2001) and Hebbar et al. (2015) noted that the most common natural preservative used are limestone powder or solution, jack fruit (Artocarpus heterophylus) wood chip, mangosteen (Garciana mangosteen) exocarp fruit skin, and finely cut Hall bark (Artha acuminata) chips or combination of these preservatives and sodium metabisulphite is also quite popular as chemical preservative in preventing the fermentation process of fresh sap.

Coconut sugar is prepared by boiling the already strained fresh sap in a casting iron wok at 105°C for