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# Changes in Total Acid of Snake fruit (*Salacca edulis* Reinw.) during Storage Room Temperature

Siska Agustina Dwi Haryanti[1], Anang Mohamad Legowo[1], Ahmad Ni'matullah Al-Baari[1,2]*, Mulyana Hadipernata[3], Wisnu Broto[3]
[1]Food Technology Department, Faculty of Animal and Agricultural Sciences, Diponegoro University, Semarang, Indonesia
[2]Central Laboratory for Research and Services Diponegoro University (CORES DU), Semarang, Indonesia
[3]Indonesian Center for Agricultural Post Harvest Research and Development (ICAPOSTRD), Bogor, Indonesia

*Corresponding author (albari@live.undip.ac.id)

**Abstract**

Snake fruit (*Salacca edulis* Reinw.) is an indigenous fruit of Indonesia that has weakness as easily-damaged fruit, therefore it has a short shelf life at room temperature. During storage, total acid may be changed in snake fruit. The purpose of this study was to determine the change of total acid in snake fruit during storage at room temperature. The total acid was calculated by titration method using malic acid calculation. Based on the results of the study showed an increase in total acid when snake fruit was stored in room temperature. As conclusion, the total acid was able to be detected in snake fruit during room storage and its change could be determined.

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## Introduction

Salak (*Salacca edulis* Reinw.) is one of the original Indonesian fruit crops whose production is quite high in various types of fruit and the Indonesian Government prioritizes as a commodity for exports purposes (Lestari *et al.,* 2011). In Indonesia, snake fruit – that is known as "salak" – is cultivated on various islands including Java, Bali, and Sumatra and it is consumed as fresh fruits. According to statistical data from the Central Statistics Agency (BPS) in 2011, salak production increased from 423.5 tons in 2000 to about 1 thousand tons in 2011. Fresh salak have been exported to various countries such as Singapore, England, Malaysia, Hong Kong, and Saudi Arabia. As one of the export commodities, salak should always in good quality and free from foodborne disease-causing microorganisms as well as it should have a long shelf life (Lestari *et al,* 2013).

Salak fruit is known also as easily-damaged fruit and its short shelf life is about 5-8 days at room temperature (Maulina, 2017). The high water content and carbohydrate content in salak causes the fruit to be easily damaged. Damage to the fruit can be caused by mechanical damage, physical damage, microbiological damage and physiological damage (Pudja, 2009). Damage to salak could be detected by foul odour and the hardness turned into soft and the colour converted to brownish (Andrianto, 2013) that may affect to the acidity in fruit. Therefore, the aims of this study was done to determine the changes in the total acid of salak during storage at room temperature.

## Materials and Methods

Salak was obtained from Turi, Sleman, Yogyakarta by one night transport to Indonesian Center for Agricultural Post Harvest Research and Development, Bogor and immediately sorted, so it had a weight of 35±3 g. After that, salak was cleaned using aseptic thin paper. Immediately after cleaning, salak was stored using 0.45 $\mu$m porous containers in a aseptic room storage which was carried out at room temperature for 10 days. A total of 60 salak were grouped into 4 containers which were used as replicates. At the 0, 5, and 10$^{th}$ day storage, three fruit snakes were taken to observe the total acidity.

Total Acid Testing Procedure

Total acidity was analyzed by titration. A total of 10 g of sample was added to 100 ml of distilled water, then was homogenized using a slow spin blender, and filtered using a aseptic filter cloth. To a 20 ml of sample, indicator of 0.1% of 3 drops PP (Phenolphthalein) was dropped. The filtrate was then titrated using 0.1 N NaOH until red in color was appeared (Rengana, 1977). Total acid levels was calculated using the molecular weight of malic acid.

Data Analysis

The test results of the total acid level were calculated using Microsoft Excel 2007 and the data was shown as average±standard deviation.

**Results and Discussion**

The total acid from the fruit is expressed as the present dominant non-volatile acid in salak. The dominant non-volatile acid is malic acid (Djaafar and Mudjisihono, 1998). Organic acids were derived from biochemical processes or from the activities of some microorganism such as fungi and bacteria (Lee *et al.*, 2013). Total acid levels in salak during storage at room temperature tended to increase 5.4% from initial level of 0.277±0.043 during 10 days of room storage. Based on the research of Santosa and Suliana (2010), total acid in salak fruit might increase at a range of 0.11 to 0.50. The acidity of salak may increase during ripening since the acids are used as a substrate of the respiration process. Increase in total acid levels in fruit during storage is due to organic acids accumulation in fruit (Anna *et al.,* 2012). Respiration remodels complex compounds in cells such as starch, sugar and organic acids, into simpler molecules such as carbon dioxide, water and energy (Wills, 1981).

Changes in total acid levels are one of the chemical changes that occur during the ripening process. Changes in total acid content of fruit after harvesting are influenced by storage temperature and fruit maturity level Pantastico (1986). Storage at low temperatures may inhibit the process of respiration in the fruit (Silaban *et al.*, 2013).

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