

Conference Paper

Determination of Levels of Phytochemical Compounds (Saponins, Alkaloids, Tannins) In Ripe Fiber Extract of Palmyra Fruit (*Borassus flabellifer* Linn)

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ABSTRACT

Palmyra fruit (*Borassus flabellifer* L.) is one of the palm tree family that can be utilized as a source of food. It also possess numerous benefits in medicinal applications, including secondary metabolites in the form of alkaloids, flavonoids, saponins, tannins, and terpenoids. All of which exhibit antioxidant, anti-inflammatory, and antimicrobial. Therefore, it is imperative to conduct quantitative phytochemical analysis to garner the composition of each compound in Palmyra fruit. This study aims to determine the level of saponins, alkaloids, and tannins in Palmyra fruit fiber extract originating from Werain village, Selaru, West Southeast Maluku. The extraction process was done using the maceration method with 96% ethanol solvent. Method: This study is geared toward quantitative laboratory-scale experiments to determine the sample level. Saponin and alkaloids were analyzed using gravimetry methods while tannins were analyzed using UV-Vis spectrophotometric. Results: it is revealed that saponins level is 1,02%; Alkaloids level is 1,5464; and tannins level is 1,0220%. Conclusion: The presence of saponins is 1,02%; Alkaloids is 1,5464; and tannins is 1,0220%.

Keywords: Ripe fiber extract of palmyra fruit (Borassus flabellifer linn.), saponin, alkaloid, tannin

Introduction

Indonesia is a country with abundant floral variety. Its wide forest and tropical climate allow for various floral to grow. In many of the plants in Indonesia, Indonesians have acknowledged thousands of plants as having medicinal effects to cure many kinds of diseases (Udayani et al., 2022).

One of the reasons for this “back to nature” lifestyle less within the belief that consuming herbal medicine is relatively safer compared to its synthetic counterpart which has negative side effects. There are plenty of ways to prevent or slow down the development of disease through medication and a healthier lifestyle. One of them is consuming functional foods that contain one or more metabolic compounds like flavonoids, alkaloids, tannins, and saponins (Noviyanty et al., 2020). Plants with secondary metabolite are often used as traditional medication. This is because the secondary metabolite has a range of benefits especially for health. In addition, plants with secondary metabolites are available and have relatively fewer side effects compared to chemical ingredients (Listiana et al., 2022).

Many of the Palmyra components can be utilized in many ways including palm sugar from its sap, handicraft from its leaves, construction materials from its trunks, and can be sold for consumption. The part in which the Palmyra tree can be consumed optimally is the young fruit. However, it is limited to only the flesh and water contents that are covered by the husk, whilst the fibrous part becomes waste. Plantations in general contain metabolite. Metabolic compound is a

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molecule that is responsible for metabolism processes in plants. These molecules are divided into two categories: secondary and primary metabolic compounds (Ngginak et al., 2021).

Scrutinizing on Mary and Jasmin's (2022) study, Palmyra fruit contains 15,6 µg/mg of tannins; 9,8 µg/mg of flavonoids; and 27,3 µg/mg of saponin; while no alkaloid and terpenoids were found. A study by Maakh et al. (2021), in contrast, found that determining mesocarp specific parameters of Palmyra fruit (*Borassus sp.*), characterized by thick extract, dark brownish, distinctive scent, and a slightly bitter taste, contains chemical compounds including alkaloids, flavonoids, saponin, tannins, and terpenoids.

Quantitative phytochemical analysis in this study is carried out to determine the bioactive (saponins, alkaloids, and tannins) level contained in genus *Borassus flabeliffer linn*. This analysis allows for attaining the bioactive compound level contained in the Palmyra fruit. In addition, future research may benefit by using empirical evidence found in this study as a foundation for further investigation to enrich the current existing literature. This study is geared toward gravimetry and spectrophotometry UV-Vis methods. With all of the justifications aforementioned, there is a need to determine the secondary metabolite (alkaloids, saponins, and tannins) level in Palmyra fruit extract (*Borassus flabeliffer linn*).

Material and Methods

Palm fruit was obtained from Werain Village, Selaru Subdistrict, Southwest Maluku Regency, Maluku Province, Indonesia with the criteria of ripe fruit, non-hard, and fibrous fruit peel. Manufacture Sample Extract Using Maceration Method with 96% Ethanol. Determination of saponin and alkaloid levels using the Gravimetric Method. Determination of tannin content using UV-Vis Spectrophotometer.



Figure 1. Extraction result of *Borassus flabeliffer L*

Results and Discussion

Results of lontar plant identification: Plant identification showed that the fruit samples used were lontar fruits derived from plants of the species *Borassus flabeliffer lin*. Organoleptic results from palm fruit fiber extract in the form of thick extract, blackish brown, and has a distinctive aroma. Quantitative phytochemical test results contained 1.02% saponin, 1.5464% alkaloid, and 1.0220% tannin in palm fruit.

Palm fruit contains antioxidant tannins, alkaloids, flavonoids, and saponins. Research by Maakh et al. (2021), using the method of thin layer chromatography, the mesocarp of the lontar fruit contains flavonoids and saponins. In the research of Ngginak et al. (2021), UV-VIS spectrophotometry showed the presence of saponins in the mesocarp of palm fruits. The results of research by Idayati et al. (2014) using the UV-Vis spectrophotometer method showed that the mesocarp of Palm fruit taken from Kupang district had a tannin content of 0.08%. The results of some of these studies prove that there are different levels in the chemical content of palm fruit. Geographical location, climate, harvesting method and time, and post-harvest treatment (drying, storage) can affect the chemical content of palm fruits.

Conclusion

The results of quantitative phytochemical tests on palm fruit contain 1.02% saponin, 1.5464% alkaloid, and 1.0220% tannin.

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