Int J Adv Life Sci Res. Volume 5(1) 12-17
https://doi.org/10.31632/ijalsr.2022.v05i01.003

International Journal of Advancement in Life Sciences Research

Online ISSN: 2581-4877

Journal homepage http://ijalsr.org

Original Article

Characterization of *Rollinia mucosa* (Jacq.) (Baill) Fruit Ethanol Extract

Siti Jubaidah*, Heri Wijaya, Aulia Mutmainah

Sekolah Tinggi Ilmu Kesehatan Samarinda, AW Syahranie Street, Number 226 Samarinda, East Borneo, Indonesia

**Correspondence E-mail :pusam_12@yahoo.com*

Abstract

Introduction: The srikaya malinau plant (*Rollinia mucosa* (Jacq.) Baill), is empirically used to treat the gastrointestinal tract, antipyretic, stamina enhancer, scabies medication and antimicrobial.Research on the efficacy and characteristics of malinau srikaya fruit extract to date has not been reported. **Objective:** determine the characterization and class of chemical compounds in the malinau srikaya fruit extract. This research is non-experimental research. The research phase includes sample collection, plant determination, making simplicia, extraction using maceration method with 70% ethanol as solvent. **Results:** The results of the extraction were characterized by organoleptic, water content, water soluble extract content, ethanol soluble extract content, ash content and acid insoluble ash content, then phytochemical screening was carried out. Data were analyzed using descriptive method. The results of the specific characterization of the organoleptic test of the extract have a thick consistency, blackish brown in colour, have a distinctive smell like soy sauce and have a bitter taste. The content of the extract was soluble in water 88%, the content of the extract was soluble in ethanol 77% and the results of the identification of phytochemical screening were known to contain flavonoids. The results of the non-specific characterization test determined the water content of 9%, ash content of 1.665% and acid insoluble ash content of 2.075%.

Keywords: *Extract, Characterization, Rollinia mucosa (jacq.) Baill*

Introduction

According to WHO, 68% of the world's population uses traditional herbal medicines to cure diseases and more than 80% of the world's population uses herbal medicines to support their health (Saifudin, A.*et.al*. 2011). Indonesia is one of the largest countries that use medicinal plants in the world, this is related to its diverse natural wealth. There are various types of plants in Indonesia that have many benefits for life, one of which is as an ingredient in traditional medicine, one of which is *Rollinia mucosa* (Jacq.) Baill (Ngajow M.*et al.*, 2013, Hidayat M.*et.al*. 2005). Rollinia mucosa is a plant that is related to sugar apple and soursop, where this plant is known to have potential as a drug because it contains secondary metabolites (Sumarni F. *et.al.* 2019).

The *Rollinia mucosa* (Jacq.) Baill) plant is empirically believed by the public as a natural medicine, the seeds in the fruit have benefits for treating gastrointestinal diseases. *Rollinia mucosa* fruit has properties as an antipyretic, stamina enhancer and scabies medicine. *Rollinia mucosa* fruit contains vitamin C in 100 g of fruit contains 82% vitamin C (Morton J.F, 1987).The leaves of srikaya contain

secondary metabolites, such as flavonoids, that have the potential to be antioxidants, according to Mubarokah I.J *et al* (2005). Srikaya contains antioxidants such as vitamin C which helps fight free radicals in the body, vitamin A which is useful for maintaining skin, hair health, and improving eye function. Potassium and magnesium contained in the fruit also prevent heart disease (Setiono D, *et.al* 2013).

Srikaya Malinau leaf extract has antimicrobial activity (Fanning, K.et.al. 2013).The use of fruit as traditional medicine must be supported by various studies so that the content of chemical compounds, the level of safety and efficacy can be known further. Research on the characteristics of the Malinau Srikaya fruit extract has not been reported to date. Characterization is useful for knowing the quality of an extract material, so that these results can be used as a reference for the development of further research (Jannat, K *et al.*2019)

Methodology

Tools and Materials

Stirring rod, beaker glass, porcelain cup, desiccator, Erlenmeyer, measuring cup, filter paper, silicate crucible, spirit lamp, mixer, analytical balance, tube clamp, dropper, spatel, water bath and test tube, malinau srikaya fruit.

A. Extract Making

Rollinia mucosa fruit was obtained from Palaran District, Samarinda City Regency. Plants were determined at the Laboratory of Plant Anatomy and Systematics, Faculty of Mathematics and Natural Sciences, Mulawarman University. Samples of 500 g of simplicia malinau srikaya fruit that have been chopped into small pieces, macerated in a vessel with 70% ethanol solvent as much as 5 L until all simplicia is submerged, soaked for the first 6 hours while stirring occasionally, then let stand for 18 hours. Then filtered to obtain maserate, repeat the process twice with the same type and solvent. Collect all the maserate, then the liquid is evaporated on a water bath until a thick extract is obtained

B. Specific characteristic test of ethanol extract

1. **Organoleptic Test**
   Organoleptic test by observing the organoleptic shape of the extract using the five senses by describing the shape, color, smell and taste
2. **Determination of water soluble juice content**
   A total of 5 g of ethanol extract was macerated with 100 mL of chloroform water for 24 hours and allowed to stand for 18 hours. Quickly filtered, 20 mL of the filtrate was evaporated in a shallow dish on a flat bottom on a water bath to dryness, the remainder was heated at 105°C to constant weight.
3. **Determination of the concentration of soluble essence in ethanol**
   A total of 5 g of ethanol extract that has been dried, macerated with 100 mL of 95% ethanol for 24 hours and then allowed to stand for 18 hours. Quickly filtered, 20 mL of the filtrate was evaporated in a flat bottomed dish on a water bath to dryness, heated the remainder at 105°C until the weight remained constant.
4. **Identification of chemical compounds**
   a) **Test for alkaloid compounds**
      Take 10 drops of ethanol extract, then put into a test tube, then added Bouchardat reagent, Dragendr of, Mayer
   b) **Test for flavonoid compounds**
      A total of 5 mL then added 0.1 g of Mg powder and 1 mL of concentrated HCl and 2 amyl alcohol, shaken, and allowed to separate.
   c) **Tannin Compound Test**
      As much as 10 drops of extract then added 1-2 drops of iron (III) chloride reagent,

d) Saponin compound test

A total of 10 drops of ethanol extract were put into a test tube, added 5 mL of hot water, cooled and then shaken vigorously for 10 seconds.

e) Test for terpenoid/steroid compounds

A total of 0.5 g of ethanol extract was put into a cup, added 10 mL of n-hexane, macerated for 1 hour and then filtered. The filtrate is evaporated and then 2-3 drops of anhydrous acetic acid are added and 1-2 drops of concentrated sulfuric acid are added

5. Non-specific characteristic test of ethanol extract

a) Determination of Water Content

A total of 2 g of extract, put in the oven for 2 hours at a temperature of 105°C. After 2 hours put in a desiccator for approximately 15 minutes, weighed until the weight obtained is constant

b) Determination of Ash Content

A total of 2 g of the ethanol extract that had been ground and weighed carefully was put in a porcelain crucible that had been ignited and thawed, then leveled. The crucible is slowly heated until the charcoal runs out, cooled and weighed

c) Determination of Ash insoluble in Acid

The ash obtained on the determination of the ash content, boil with 25 mL of dilute sulfuric acid for 5 minutes, collect the insoluble part in the acid, filter through a glass crucible or ash-free filter paper of known weight, then the remainder is heated, then cooled and weighed to a constant weight

Result and Discussion

Table 1: Results of Phytochemical Screening Examination of the Ethanol Extract of *Rollinia mucosa* Fruit

No.	Compound Test	Result
1	Alkaloids	(-)
2	Flavonoids	(+)
3	Tanins	(-)
4	Saponins	(-)
5	Steroids /Terpenoids	(-)/(-)

Table 2:Result of Organoleptic Examination of the Ethanol Extract of *Rollinia mucosa* Fruit.

No.	Organoleptic Examination	Result
1	Extract Consistency	Thick
2	Colour	Blackish Brown
3	Odor	a distinctive odor like soy sauce
4	Taste	Bitter

Table 3:Results of Examination of Water Soluble Essence Levels and Ethanol Soluble

No.	Test	Result
1	Water Soluble Essence Levels	88%
2	Ethanol Soluble	77%

Table 4:Result of Non-Specific Characterization of *Malinau Srikaya* Fruit Ethanol Extract

No.	Non-Specific Characterization Test	Result
1	Determination of Water Content	9 %
2	Determination of Ash Content	1,665%
3	Determination of Acid Insoluble Ash Content	2.075%

A. Specific Characterization of Malinau Srikaya Fruit Ethanol Extract

1. Results of Organoleptic Examination of the Ethanol Extract of *Rollinia mucosa* Fruit.

The results of organoleptic examination of the ethanolic extract of *Rollinia mucosa* fruit obtained that the extract was thick in consistency, blackish brown in color, had a distinctive odor like soy sauce and had a bitter taste.

2. **Results of Examination of WaterSoluble Essence Levels and Ethanol Soluble**

Testing of specific parameters, especially the water soluble extract content and the ethanol soluble extract content, serves to determine how much the compounds in the simplicia contain in water and ethanol solvents. This can underlie whether the simplicia used is extracted using a solvent that can dissolve the compounds well or not. Because the purpose of taking active compounds depends on the nature of the polarity of the compound in question. Whether the compound in question has polar, semipolar,or nonpolar properties (Rayanti I *et al*, 2016).

Essence Levels Ethanol Extract of Rollinia mucosa Fruit. The concentration of water-soluble extract aims to determine the levels of polar chemical compounds contained in the extract, the results obtained are 88%. The concentration of soluble extract in ethanol aims to determine the content of compounds soluble in ethanol which are semi-polar and non-polar, obtained as much as 77%. The water-soluble extract content was greater than the ethanol-soluble extract content, this indicated that the amount of chemical compounds soluble in water was more than soluble in ethanol. The content of water soluble extract and ethanol soluble extract content has a high percentage because the Rollinia mucosa fruit does not go through a drying process, this makes it possible that the chemical compounds contained in the simplicia are still intact.

3. Results of Phytochemical Screening of the Ethanol Extract of Rollinia mucosa fruit.

Phytochemical screening was carried out to obtain information about the class of secondary metabolites contained in the extract. The test groups of these compounds include alkaloids, flavonoids, tannins, saponins and steroids/terpenoids.

The flavonoid test showed an orange color which means that the ethanol extract of putat leaves was positive for flavonoid compounds. The addition of concentrated Mg and HCl metals in this test serves to reduce the benzopyron core contained in the flavonoid structure so that a color change becomes dark red or orange (Ergina E *et.al*,2014). Flavonoid compounds also have potential as antioxidants because their structure contains hydroxyl groups that can donate hydrogen atoms to free radicals (Supomo S. *et al,* 2020).

B. Non-Specific Characterization of Malinau Srikaya Fruit Ethanol Extract

1. Results of Determination of Water Content

The results of the determination of the moisture content of the thick extract obtained 9%, this is still in accordance with the requirements set by Voigt (1995) namely for 15-30% thick extract, more than 30% liquid extract and less than 5% dry extract. Large water content can cause microbial growth because water is a medium for the growth of microorganisms and also as a medium for enzymatic reactions that can decompose active compounds. The measurement of water content is carried out in addition to avoiding the rapid growth of fungi in the extract, measuring the water content is also to maintain the quality of the extract (Supriningrum R *et al*, 2017).

2. **Results of Determination of Ash Content**
   The results of the determination of the ash content obtained were 1.665%. Determination of ash content has to do with minerals and a material which can be organic and inorganic salts. With this, the ash content becomes very important because the ash content can indicate the feasibility of a sample for further processing. Determination of ash content aims to provide an overview of the internal and external mineral content from the initial process until the extract is formed, in principle, the extract is heated until organic compounds and their derivatives are destroyed and evaporated until only mineral and inorganic elements are present (Khoirani N *et.al,* 2013). According to Saragih R *et.al* (2014) the higher the ash content, the higher the minerals contained in the material.
3. **Result of Determination of Acid Insoluble Ash Content**
   The results of the determination of the acid insoluble ash content obtained were 2.075%. Determination of acid insoluble ash content is carried out in order to determine the levels of acid insoluble compounds, such as silica, heavy metals such as Pb and Hg (Depkes RI, 2000). The method of determining the acid insoluble ash content using ash obtained from the determination of the total ash content with the addition of HCl aims to determine contamination originating from external factors such as sand from the soil and dust attached to the drying time (Suharti N *et al*., 2017).

Conclusion

The specific characteristics of the ethanol extract of Srikaya Malinau fruit organoleptically have a thick extract form, blackish brown in color, distinctive odor and bitter taste. It is known that the content of the extract is soluble in water 88%, the content of the extract is soluble in ethanol 77%. The secondary metabolite compound group of Rollinia mucosa fruit extract contains flavonoid compounds. The non-specific characteristics of the ethanolic extract of Rollinia mucosa fruit were known to have 9% water content, 1.665% ash content and 2.075% acid insoluble ash content.

Conflicts of Interest

The authors declare no conflict of interest

References

Departemen Kesehatan Republik Indonesia. (2000). *Parameter Standar Umum Ekstrak Tumbuhan Obat*. Jakarta: Departemen Kesehatan RI. Page: 10-11, 14-17, 31.

Fanning, K., & Diczbalis, Y. (2013). Collation of health literature for tropical and exotic fruits and extracts.

Ergina, E., Nuryanti, S., & Pursitasari, I. D. (2014). Uji kualitatif senyawa metabolit sekunder pada daun palado (Agave angustifolia) yang diekstraksi dengan pelarut air dan etanol. *Jurnal Akademika Kimia*, *3*(3), 165-172.

Hidayat, M. S. (2005). *Ramuan tradisional ala 12 etnis Indonesia*. Penebar Swadaya.

Khoirani, N. (2013). Karakterisasi Simplisia dan Standardisasi Ekstrak Etanol Herba Kemangi (Ocimum americanum L.). *Skripsi. Program Studi Farmasi, UIN Syarif Hidayatullah, Jakarta*.

Morton, J. F., & Dowling, C. F. (1987). *Fruits of warm climates* (Vol. 20534). Miami, FL: JF Morton.

Mubarokah, I. Z., Aznam, N., & Nurani, L. H. (2005). UJI AKTIVITAS ANTIOKSIDAN INFUSA DAUN SRIKAYA (Annona squamosa, L). *Journal FMIPAUNY*, 91-98.

Ngajow, M., Abidjulu, J., & Kamu, V. S. (2013). Pengaruh antibakteri ekstrak kulit batang matoa (Pometia pinnata) terhadap bakteri Staphylococcus aureus secara in vitro. *Jurnal MIPA UNSRAT*, 2(2), 128–132. https://doi.org/10.35799/jm.2.2.2013.3121 .

Jannat, K., Rahman, T., & Rahmatullah, M. (2019). Traditional uses, phytochemicals and pharmacological properties of Allium tuberosum Rottler ex spreng. *J Med Plants Stud*, *7*, 214-220.

Rayanti, I., Yuniarni, U., & Purwanti, L. (2016). Karakterisasi simplisia dan ekstrak etanol kulit buah naga merah (Hylocereus lemairei (Hook.) Britton & Rose). http://dx.doi.org/10.29313/.v0i0.4024 .

Saifudin, A., Rahayu, V., & Teruna, H. Y. (2011). Standarisasi Obat Bahan Alam.

Saragih, R. (2014). Uji kesukaan panelis pada teh daun torbangun (Coleus amboinicus). *E-Journal Widya Kesehatan dan Lingkungan*, *1*(1), 36804.

Setiono, D., Parjanto, P., & Djoar, D. W. (2013). Identifikasi Morfologi Aksesi Srikaya (Annona squamosa) di Gedangsari Gunungkidul. *Agrosains: Jurnal Penelitian Agronomi*, *15*(2), 32-35. https://doi.org/10.20961/agsjpa.v15i2.18994 .

Suharti, N., Yossi, G. L., & Elidahanum, H. (2017). Karakterisasi simplisia dan ekstrak etanol serta uji aktivitas antioksidan rimpang jahe merah (Zingiber Officinale Var. Vubrum Theilade) yang diinokulasi fungi mikoriza arbuskula (FMA). *Jurnal Sains dan Teknologi Farmasi*, *19*(1), 70.

Sumarni, F., Saleh, C., & Pratiwi, D. R. (2019). The Phytochemical Test And Antioxidant Activity (Dpph Method) From Leaves Of Biriba (Rollinia mucosa (Jacq.) Baill.). *Jurnal Atomik*, *4*(1), 9-13.

Supomo, S., Saadah, H., Syamsul, E. S., Kintoko, K., & Witasari, H. A. (2020). KARAKTERISASI PARAMETER SPESIFIK DAN PARAMETER NON SPESIFIK AKAR KUNING (Fibraurea tinctoria). *Jurnal Ilmiah Ibnu Sina*, *5*(2), 416-425. https://doi.org/10.36387/jiis.v5i2.592 .

Supriningrum, R., Handayani, F., & Liya, L. (2017). KARAKTERISASI DAN SKRINING FITOKIMIA DAUN SINGKIL (Premna corymbosa Rottl & Willd). *Jurnal Ilmiah Ibnu Sina*, *2*(2), 232-244.https://doi.org/10.36387/jiis.v2i2.118

Voigt, Rudolf. (1995). *Buku Pelajaran Teknologi Farmasi*. Edisi kelima. Yogyakarta: Gadjah Mada University Press. Page: 577.