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IDENTIFICATION OF SECONDARY METABOLIC COMPOUNDS GARLIC ROOT ETHANOL EXTRACT (Crinum asiaticum L.)

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ABSTRACT

Background: Lily plant is a plant that has efficacy in traditional medicine, the Latin name of the lily plant is Crinum asiticum L. The lily plant provides antimicrobial, anti-inflammatory, antioxidant, anti-emetic, laxative, diuretic, rheumatic, and bleeding control effectiveness. **Objective:** The population in this study was lily roots taken from Tunuo Village, North Kao District, North Halmahera Regency. **Method Research:** phytochemical screening method The sample used in this study was 100-gram lily root Simplicia powder. Maceration was carried out for 3 days, at room temperature protected from direct sunlight while stirring occasionally. for 3 days the maceration was filtered and the dregs were squeezed out. then the dregs were macerated with 400 ml of 70% ethanol solvent for 3 days, then filtered the filtrate was collected and evaporated with a rotary evaporator to produce a thick ethanolic extract of lily roots.

Research Results: results of phytochemical screening tests for secondary metabolites found in ethanol extract of lily root. Contains flavonoids, alkaloids, saponins, and tannins.

Conclusion: ethanolic extract of the lily root contains secondary metabolites because it contains flavonoids, alkaloids, tannins, and saponins.

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PRELIMINARY

The Indonesian nation is rich in natural resources; almost all kinds of plants can be grown in this country.[1] especially medicinal plants. The lily plant is one of the herbal plants consumed by the community as medicine.[2]

Plants are widely used as medicine. The knowledge of the people of North Maluku about medicinal plants was passed down from one era to another. Currently, there is a great deal of aid for the scientific exploration of plants whose abilities are generally not seen as utilization and decoration, but also as medicinal plants.[3]

Traditional medicine is a material sourced from minerals, animals, and plants that have been used for generations for treatment, disease prevention, or health maintenance. [11] Currently, herbal medicines are increasing in both developing and developed countries. There are several factors that cause, among others, history, culture, and individual attitudes. Herbal medicines that are widely used throughout the country or region are plants.

North Maluku is a society full of natural resources. Especially plants used in traditional medicine. Lilies have a significant impact on the treatment of diseases. The people of North Kao District often use this plant as one of the herbal medicines they use to treat various diseases

Currently, the people of North Kao Sub-district, especially in Tunuo Village, many people tend to use lily as herbal medicine to eliminate poisoning caused by the rabies virus. This lily plant also has leaves, flowers, stems, roots, and tubers.[3]

The Latin name of the lily plant is Crinum asiaticum L. The lily plant is useful in traditional medicine because of its antimicrobial, anti-inflammatory, antioxidant, antiemetic, laxative, diuretic, rheumatic, and bleeding properties.[13]

In a previous study of lilies, the ethanol extract of the lily consisted of alkaloids, flavonoids, sapiens, triterpenoids, and steroid secondary metabolites. Flavonoids, sapiens, and tannins are examples of secondary metabolites found in lilies. Alkaloids can be found in roots, seeds, and tubers.[2]

Secondary metabolites themselves are organic molecules that have a function for growth and development. Several plant organs, such as roots, leaves, flowers, fruits, and seeds, can make secondary metabolites.[4.]

Based on the description, the researcher wants to do additional research on the identification of secondary metabolites of ethanol extract samples taken in the study, namely the lily root extract, which is currently being found by many people, especially the coastal area of Tunuo Village, North Kao District.

RESEARCH METHODS

A. **Type of Research**

This type of research uses a phytochemical screening method to find secondary metabolites in the ethanolic extract of lily root on a laboratory scale.

B. **Population and sample**

1. Population

This study used lily roots from Tunuo Village, North Kao Districtand, North Halmahera Regency as the population.

2. Sample

This study uses a sample of 100 grams of lily root Simplicia powder.

How it works

1. Material collection Lily roots taken from Tunuo Village, District, North Kao, Kab, and North Halmahera were used. Sorted wet, washed with running water, and then dried by aerating at room temperature.
2. Making Daffodil Root Ethanol Extract 1 kg of dried samples of lily roots was re-sorted from the remaining dirt, the simplicia which had been sorted and then mashed by coarsely ground until a small powder was obtained, then sieved using an 80 mesh sieve, intended for uniformity of Simplicia size making it easier for processing extraction. After

The manufacture of lily root extract was carried out using the maceration technique. 100 grams of lily root Simplicia powder and 600 ml of 70% ethanol solvent.

Maceration was carried out for three days at room temperature, under indirect sunlight, while stirring occasionally. The rest is squeezed after maceration and filtered for three days. After that, the pulp was macerated for three days in 400 milliliters of 70%. ethanol solvent, filtered, then evaporated using a rotary evaporator to produce a thick ethanol extract of lily root.

3. Identification of secondary metabolite compounds. A phytochemical screening test was carried out to determine the secondary metabolite compounds contained in the roots of the lily.

    1. Flavonoid Test
    10 Mg lily root samples, 5 ml ethanol, and a few drops of FeCl3 were added to the solution until a color change occurred. If there was a color change to black, blue, purple, green, or red, and no color change occurred, up to 20 drops occurred. FeCl3, then negative flavonoids.[27]
    2. Alkaloid Test
    10 mg of the lily root was taken, 10 mL of HCI was added, and the mixture was heated for 2 minutes with constant stirring. Then the extract mixture was filtered. A few drops of Wanger's reagent were added to the filtrate, if it was a brown precipitate then the alkaloids were positive.

RESEARCH RESULT

A. Results

Table 4. 1 Phytochemical Screening Results of ethanol extract of lily root

PHOTOCHEMICAL SCREENING	REACT OR	OBSERVATIONS	RESULTS
Flavonoids	Ethanol $FeCl_3$	Shaped black color	+
Alkaloids	HCI Wanger	In the form of a brown precipitate	+
Saponin	Aquades	Bubble	+
Tanin	Aquades $FeCl_3$	In the form of green-brown	+

The table above, the results of the phytochemical screening test for secondary metabolites in the ethanolic extract of the lily root. Contains saponins, alkaloids, tannins, and flavonoids.

Table 4.2 Yield of thick extract of lily root

Simplicia	Powder sample (grams)	Ekstract (grams)	yield (%)
Daffodil root	100	15	15

The yield of the thick extract of lily root based on the table above is 15% with a weight of 100 grams of simplicia powder and 15 grams of thick extract.

a. Yield calculation formula 27
% Yield = weight of thick extract (grams) x 100%
Simplicia weight (grams)
% Yield = 15 gram x 100 %
100 grams
% Yield = 15 %

DISCUSSION

A. Discussion

This research was conducted in the laboratory of the Faculty of Health Sciences Makariwo Halmahera. In this study, the sample used was 100 grams of lily root powder taken from Tunuo Village, North Kao District, North Halmahera Regency. Samples were cleaned using clean and running water, washing was carried out to remove dirt attached to the simplicia.

Simplicia is dried at room temperature and protected from direct sunlight, the purpose of drying is to reduce the water content in simplicia. Simplicia in dry sorting by separating the remaining impurities in the dry simplicia.

The simplicia was mashed using a blender, refining was done to make it easier for the solvent to enter the simplicia and attract more compounds into it. The simplicia was sieved using a sieve, the sieving was carried out to separate the small particles mixed in the simplicia and facilitate the extraction process.

The maceration method, which involves immersing the simplicia in a solvent at room temperature (without heating) to prevent the breakdown of the simplicia metabolites, is used in the extraction procedure because of its simplicity and wide use. Because ethanol can be polar, it is used as a solvent because it can extract polar and non-polar compounds in various polarities.[15]

The weight of simplicia macerated with ethanol solvent is 100 grams of simplicia dissolved with 600 ml of ethanol for 3 days while occasionally stirring. Because the longer the simplicia is soaked, the higher the yield value.[15] This can happen because there is a continuous extraction process.

The chemical components or compounds in the sample are isolated effectively through repeated filtration with a relatively constant amount of solvent.[16] The solvent will penetrate the cell wall and then enter the cell cavity which contains the active substance. the active substance will dissolve. If this is done again, the solution outside and inside the cell has the same concentration. To speed up the extraction process, stirring is done.[7]

The macerated simplicia is evaporated to evaporate the solvent. With a variety of compounds contained in the roots of the lily, with different chemical structures can have an impact on the solubility and

stability such as light, air. With evaporation in the maceration process to prevent damage to the extract, because evaporation is better and it is easy to separate solvents from different extracts with light. during the maceration process it must be evaporated to produce a thick extract.[13] with an extract weight of 15 grams and an extract yield of 15%.

The thick extract from the root of the lily was tested for flavonoid compounds, alkaloids, saponins, and tannins, using the phytochemical test method. The purpose of the phytochemical test of this study was to determine the content of the secondary metabolites of simplicia.[12]

In this follow-up study, the ethanolic extract of the lily root was used for testing secondary metabolites using the phytochemical screening method.

Identification of flavonoids in the ethanolic extract of the lily root which was added to an ethanol solution and the addition of positive FeCl3 resulted in a change in the color of the solution to black. This is because flavonoid compounds undergo a reduction reaction caused by FeCl3 and ethanol. In previous studies, it was written that flavonoid compounds found in plants were useful as medicines, both as antibleeding and antihypertensive.[18] Asiyah Mentari and Nurul Hidayah tested flavonoids in daffodils. on the identification of flavonoids with a phytochemical screening method in which 0.5 M Mg and HCl react to become yellow. [7]

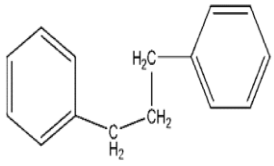

Figure 5.1 The Figure 5.1 The basic structure of flavonoids.[28]

Identification of alkaloids in the ethanolic extract of lily roots which was added with HCl and the addition of positive wanger resulted in a change in the form of a brown precipitate. The purpose of the addition of HCl is to extract alkaline alkaloids using an acid solution. alkaloids to form a complex that precipitates.[19] while Aisyah Mentari and Nurul Hidayah tested the lily leaf alkaloids.

In the identification of alkaloids with a phytochemical screening method where Meyer's reagent is in the form of a yellow lumpy precipitate, Dragendrof's reagent is in the form of an orange precipitate and Bouchardat's reagent is in the form of a dark brown precipitate.

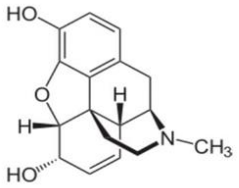

Figure 5.2 Basic structure of alkaloids.[29]

Identification of tannins in the ethanolic extract of lily roots added with distilled water and the addition of positive FeCl3 resulted in a change in the color of the solution in the form of a green-brown color. This is because aquadest is polar so it easily reacts with FeCl3. A previous study wrote that tannins are polar compounds because they have an OH group in them. Therefore, a green-black color change occurs when FeCl3 is added to the sample, indicating the presence of tannin compounds.[20] Aisyah Mentari and Nurul Hidayah conducted a tannin test on C. asiaticum L. leaves to identify tannin with a phytochemical screening method where there is no precipitate of FeCl3 which gives a negative result.[7]

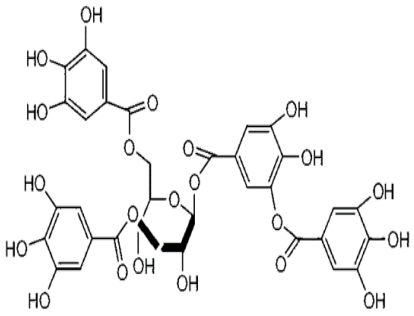

Figure 5.3 basic structure of tannins.[28]

Identification of saponins in the ethanolic extract of lily roots added with distilled water. Positive is in the form of foam. This is because saponins can reduce the surface pressure of the water, so that foam forms on the surface of the water after shaking.21 Aisyah Mentari and Nurul Hidayah conducted a saponin test on daffodils on the identification of saponins by the method phytochemical screening in which 2N HCl formed foam which gave a positive result.[7]

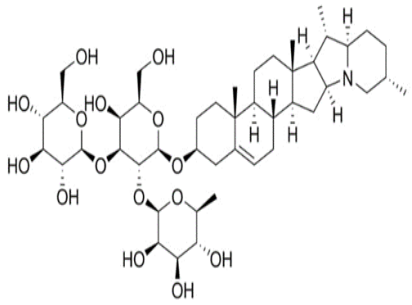

Figure 5.4 The basic structure of saponins.[25]

The results of previous studies conducted on the ethanolic extract of daffodils with phytochemical screening methods showed that there were flavonoid compounds, alkaloids, saponins, and tannins. Tannins have an anti-inflammatory effect so that they can inhibit the release of prostaglandins in the arachidonic pathway, which are inflammatory mediators

CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

Based on the results obtained from the research, it is concluded that The ethanolic extract of the lily root contains secondary metabolites because it contains tannins, alkaloids, flavonoid compounds, and saponins.

B. Suggestion

Based on the conclusion of the research on secondary metabolites of the ethanolic extract of the lily root, the authors provide suggestions for other researchers to conduct further research using the fractionation method.

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