EFFECTIVENESS OF CHROMATOGRAPHIC METHOD FOR ORDERING SECONDARY METABOLITE COMPOUNDS ON PLANT (PEPEROMIA PELLUCIDA L.) WITH METHANOL SOLUTIONS

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Abstrak

This study aims to determine the effectiveness of chromatographic methods to isolate secondary metabolite compounds in methanol condensed extracts of surrogate plants. A total of 200 grams of simplified planting plants were macerated with methanol solvent for 8x24 hours. The resulting maserate is further distilled to produce a methanol condensed extract of 40 grams. Methanol condensed extract was further analyzed by using thin layer chromatography to see how many compounds in the sample. The result of the thin chromatography obtained by the color of the basket showing in the plants there are some compounds.

Keywords: Surety, Isolation, Simplicia, Secondary Metabolite, Flavonoids

1. Introduction

1.1 Background

The natural wealth possessed by the Indonesian people is very abundant, especially the richness of flora that has many varieties of plants. These plants have great benefits for human life, especially as a source of food and medicine. Plants are the essential ingredients that must exist and become the main food source for the nation of Indonesia, while for the source of drugs, kekayaann flora in Indonesia is actually quite widely exploited by our nation's ancestors to treat various diseases.

One of the plants that are often used as a traditional medicine is plant suruhan (Peperomia pellucida L.). Society in general, do not know the efficacy and benefits of plant suruhan (Peperomia pellucida L.). Plants (Peperomia pellucida L.) are small and shallow-rooted plants. Plants (Peperomia pellucida L.) are weeds that usually grow wild in places that are moist and clustered. Plants (Peperomia pellucida L.) have traditionally been used in treating several diseases, such as gout, ulcers, acne, skin inflammation, kidney disease, and abdominal pain (Hariana, 2006). People in North Sulawesi have also used this plant to lower blood cholesterol (Sitorus, Momuat, and Katja, 2013)

Based on the results of research conducted by Nithiya Paramsothy, Yasmiwar Susilawati, and Supriyatna (2012) it is known that the secondary metabolite compounds contained in plants ordered (Peperomia pellucida L.) include flavonoid compounds, tannins, saponins, steroids, monoterpenes, and sesquiterpen. Secondary metabolite compounds contained in plants are bioactive substances associated with chemical content

in plants, so some plants can be used as a drug ingredient. Secondary metabolites can be spread throughout plant organs such as leaves, roots, stems, flowers, skin, tubers, and fruit. The type and content can be the same or different in every plant organ.

In this study the chromatography to be used is column chromatography which will then be tested for purity by thin layer chromatography. Chromatographic methods are chosen for many advantages, such as rapid and selective separation methods. The equipment used is simple and easy to obtain. Complex mixes can be easily separated. Another advantage is that the footage used very little. Test compounds in chromatography can be done repeatedly.

The process of isolating a secondary metabolite compound on a plant requires a good solvent to extract the compound. The choice of solvent in the extraction process will give a high effectiveness in considering the solubility of natural material compounds in the solvent. Methanol is one good solvent that is often used to extract compounds. In general, methanol solvent is the most widely used solvent in the process of isolation of organic compounds of natural materials because it can dissolve the class of secondary metabolites (Darwis, 2000; Anonymous 1993).

Extraction is a method used to separate a component from another component or from a mixture of components. Extraction of a component can be done using chromatography. The identification of secondary metabolite compounds was used UV-VIS and IR spectrophotometers. Based on the above background the researcher tries to isolate and identify the secondary metabolite compounds found in the farming plants (Peperomia pellucida L.) with methanol solvent using column chromatography method and tested purity with thin layer chromatography.

1.2 Formulation of the problem

Based on the background presented there are several problems that can be formulated, among others:

1. How are the results obtained from the isolation of the surfer plants (Peperomia pellucida L.)?
2. How long will it take in the process of isolating secondary metabolite compounds from the surrogate plants (Peperomia pellucida L.)?
3. How is the effectiveness of chromatographic method in the process of isolation of secondary metabolite compounds from the surrogate plants (Peperomia pellucida L.)?

1.3 Purpose

Goals to be achieved in this program include:

1. Knowing the results of isolation on the surfer plant (Peperomia pellucida L.)
2. Knowing the time required for the process of isolation of secondary metabolite compounds from plant suruhan (Peperomia pellucida L.)
3. Knowing information about the effectiveness of chromatographic methods on the process of plant isolation (Peperomia pellucida L.)

1.4 Expected Expectations

Based on the above description, the target outcome to be achieved is:

1. Getting information about the secondary metabolite compounds in the surfer plants (Peperomia pellucida L.)
2. Produce scientific articles for the publication of national seminars

1.5 Research Benefits

Benefits to be achieved in this program include:

1. For Kemristekdikti
   Knowing the effectiveness of chromatographic methods on the process of plant isolation (Peperomia pellucida L.)
2. 2. For the Community
   Provides information on the usefulness of compounds contained in the plant (Peperomia pellucida L.) and how to obtain it
3. 3. For Researchers
   The resulting compounds can be re-examined for the health field

2. Method Implementation

2.1. Time and Place of Study

The research was conducted in Integrated Laboratory of Muhammadiyah University of Semarang for 4 months. The study used column chromatography method and tested purity with thin layer chromatography.

2.2. Research variable

In this study the process of isolation as independent variables, and secondary metabolite compounds as dependent variable. The object of the study was the plants of the order (Peperomia pellucida L.). The initial method used is solvent extraction using a maceration system. The extract result from maceration will be reused by column chromatography method and tested purity with thin layer chromatography.

2.3. Tools and materials

The tools used in this research are glass beaker, measuring cup, dropper drop, analytical balance, evaporator, micro pipette, set of column chromatography tool, set of thin layer chromatography tool, UV lamp, funnel, separating funnel, stative and clamp, spatula , test tube, Petri dish, UV-Vis Spectrophotometry, and Infrared Spectrophotometry.

The ingredients used in this research are the plants (Peperomia pellucida L.) obtained from Semarang area. The chemicals used are aquades, methanol, ethyl acetate, n-hexane, chloroform, acetone, anhydrous acetic acid, silica gel, TLC plate, phytochemical reagents, and diethyl ether reactants.

2.4. Research procedure

A. Extraction Process

1. Roots, stems, and leaves of the surfer's plants are washed thoroughly, cut into small pieces and then dried and extracted by maceration using methanol.
2. The maseration is carried out for 8x24 hours, each 2x24 extract is filtered and macerated with new methanol.
3. The extracts are added together to obtain the methanol filtrate.

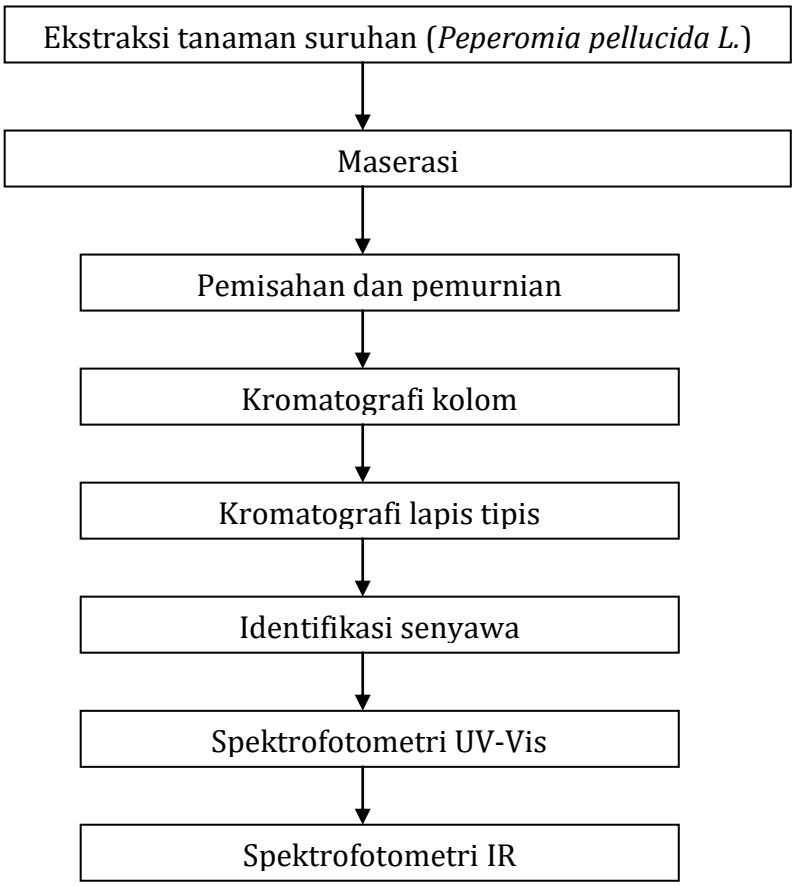
4. Evaporation is carried out at a temperature of 40˚C by using a vacuum evaporator to obtain a thick methanol extract.

A. Separation and Purification

The extract of methanol obtained will be analyzed by using thin layer chromatography to see how many compounds in the sample. The 2-gram methanol extract was separated by column chromatography with silica gel stationary phase and eluent elute elute. Isolates from methanol extracts from column chromatography were tested for purity by 2-dimensional thin layer chromatography to see the same stain pattern to be combined. If isolates still show a single stain pattern, then it can be said that the isolates are pure. Thin layer chromatography isolates having similar retention factors (Rf) were combined and evaporated and phytochemically tested.

Identification of Compounds

The isolated and purified isolates of the methanol fraction which have been tested by phytochemicals and have been in thin layer chromatography, were further identified using UV-Vis spectrophotometer and Infrared spectrophotometer to find out the secondary metabolite compounds contained in the surrogate plants. Here is the work scheme to do:



3. Result

3.1 Sample Preparation

The ripe plants consisting of stems and roots are cleaned by washing until clean, then dried in the open until the water wash dry. Once dried and then cut to a small size and dried back in a way diangin-aired in open areas that are not exposed to sunlight. Further weighed and obtained dry simplicia as much as 200 grams.

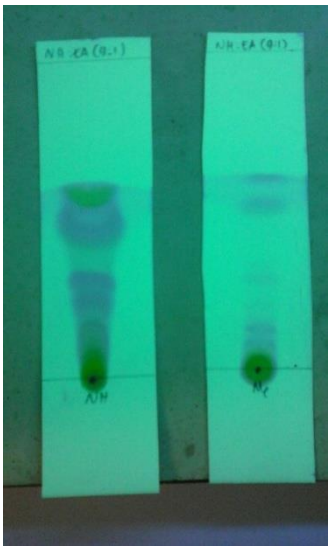
3.2 Extraction

A total of 200 grams of dried simplicia from the surrogate plant was extracted by maceration using a methanol solvent. The maseration is carried out for 8x24 hours, in which every 2x24 hours of methanol extract is filtered and re-macerated with new methanol. The obtained methanol filtral is then agitated and distilled with a distillation apparatus until a methanol viscous extract is formed. Methanol condensed extract obtained as much as 20% of the weight of dry simplisia each maseration that is about 40 grams and blackish green.

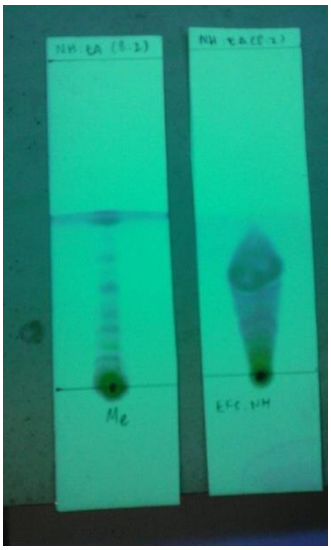
3.3 Separation

The methanol condensed extract obtained will be analyzed by thin layer chromatography (TLC). TLC was performed using a mobile phase in the form of eluent successively with a ratio of N-hexane eluates: ethyl acetate (8: 2) and (9: 1). This is done to see how many compounds are contained in the sample through stains and color bumps. In addition to know the exact eluent comparison.

The TLC results can be seen in the following figure:



N-heksan : Etil Asetat
9:1



N-heksan : Etil Asetat
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4. Conclusions

Based on the results of the research, it can be concluded that the methanol condensed acid plant extract (Peperomia pellucida L.) contains some secondary metabolite compounds. The stages in this study that begins with the preparation of the sample, as much as 200 grams of dried sampling plant sample macerated for 8x24 hours.

5. Daftar Pustaka

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