

## IDENTIFICATION OF ETHYL ACETATE FRACTION OF 70% ETHANOL EXTRACT OF GLODOKAN TIANG LEAF (*Polyalthia longifolia* (Sonn.) Thwaites)

**Metha Anung Anindhita<sup>1</sup>, Kharismatul Khasanah<sup>1\*</sup>, Sajuri<sup>2</sup>, Essya Chantika M. A.<sup>1</sup>,  
Tata Ika Sabrina<sup>1</sup>**

<sup>1</sup>Program Studi S1 Farmasi, Fakultas Farmasi, Universitas Pekalongan

<sup>2</sup>Program Studi S1 Argoteknologi, Fakultas Pertanian, Universitas Pekalongan

E-mail address of the corresponding author: [khaskharisma@gmail.com](mailto:khaskharisma@gmail.com)

### Abstract

Current technological advances, have an impact on changing people's unhealthy life patterns, which can cause degenerative diseases such as cancer. One of them is caused by free radicals, which can cause oxidative stress, which is an imbalance condition between free radicals and antioxidants, one way to overcome oxidative stress is by adding antioxidant compounds. Compounds that have properties as natural antioxidants are flavonoids, alkaloids, and tannins. Glodokan tiang is one of the plants reported to contain these compounds, in the leaves there is a strong activity of antioxidant compounds. This study aims to identify the compounds contained in the ethyl acetate fraction of glodokan tiang leaves, fractionation is carried out to separate compounds with solvents based on the level of polarity in ethyl acetate fraction samples. This research is an experimental study, which is to know the compounds contained in samples of ethyl acetate fraction of 70% glodokan tiang ethanol extract. A sampling of glodokan tiang leaves was carried out by a drying process that had previously been sorted first, the drying process using sunlight and an oven at a temperature of 105°C and extraction using 70% ethanol, after that the extract was fractionated using ethyl acetate and then carried out a compound identification test.

**Keywords:** degenerative diseases, cancer, antioxidants, glodokan tiang

### INTRODUCTION

Increasing technology and physical activity are likely to diminish and consumption of high-sugar beverages and *junk food adds* new problems. Smoking and alcoholic beverages are also one of unhealthy patterns of living habits and one of the causes of degenerative diseases such as asthma, stroke, chronic kidney failure, diabetes mellitus, hypertension, and cancer (Linda, 2021). One of the degenerative diseases that often occur in the community is cancer.

Cancer occurs due to the presence of free radicals resulting in oxidative stress, where there is an imbalance between the number of free radicals and antioxidants triggered by two common conditions, namely lack of antioxidants and excess production of free radicals in the body

(Situmorang, 2020), so antioxidant compounds are needed.

Flavonoid compounds are one of the most common secondary metabolite compounds found in plant tissues (Redha, 2018). In research (Soemarie, 2018), one of the plants that contain flavonoid compounds is the glodokan tiang plant.

Glodokan tiang plants are found on the roadside, this plant in addition to being a shade for the road is also used as a fence plant and garden decoration (Susilo, 2016). In research (Kurniawati, 2021), phytochemical studies of *polyantha longiofolia* found many isolated compounds. These compounds were tested using KLT which contained chemical compounds such as tannins, phenols, saponins, alkaloids, and flavonoids as the main compounds. One part of the glodokan

tiang plant, which shows the highest activity of flavonoid compounds is found in its leaves (Soemarie, 2018).

The selection of the leaf part on the glodokan tiang is because it has the most active compounds found in the leaf and is most easily used as an antioxidant test. To ensure that the leaves contain antioxidants, it is necessary to do an identification test for antioxidant compounds.

## RESEARCH METHOD

This research is an experimental study, namely to determine the compounds contained in samples of ethyl acetate fraction of 70% glodokan tiang ethanol extract.

The samples used in this study were obtained from glodokan tiang trees around the University of Pekalongan, and young leaves were selected because they contain more antioxidant compounds.

## RESEARCH TOOLS AND MATERIALS

Tools: glassware (*Pyrex*), drip pipette (*pyrex*), volume pipette, micropipette (*pyrex*), measuring flask (*pyrex*), test tube (*pyrex*), oven (*Anymetre*), maceration vessel, moisture analyzer (*And mx-50*), grinder, rotary evaporator (*Boeco-RV0 400 SD*), analytical balance (*CHQ*), electric stove (*Maspion*), micropipette (*Socorex*), test tube rack, horn spoon, parchment paper, aluminum foil, filler, tissue

Ingredients: glodokan tiang leaves, ethyl acetate (Merck), n-hexane (Merck), methanol (Merck), 70% ethanol (Merck), HCl (Merck), Wagner solution (*Nitra Chemical*), NaOH (Merck), FeCl<sub>3</sub> (*Merck*), HCl (Merck), wilstater reagent (Chemical *Ophin*), bate-smite reagent (Chemical *Nitra*), NaOH10% (*Merck*), mayer reagent (Chemical Center), draggendroff reagent (Chemical *Centra*), FeCl 1% (Chemical *Centra*), gelatin (*Chemical Nitra*).

## METHOD

### 1. Organoleptic Test

Organoleptic tests are carried out using the five senses of smell, taste, and color in the simplistic of glodokan tiang leaves (Wijaya, 2022). The organoleptic parameters of the ethyl acetate fraction of glodokan tiang leaves are typically aromatic, blackish-brown in color, slightly sticky shiny viscous texture, and bitter taste.

### 2. Moisture Test

Testing using a moisture analyzer. The moisture content test is said to be good if, the figure that comes out on the tool is < 10%, the viscous extract has a moisture content between 5-30 % (Yuri, 2017).

### 3. Extraction

Glodokan tiang's simplisia was extracted by maceration method using 70% ethanol (1:5). Macerated extraction as much as 1x24 hours. The extraction results are filtered and macerated for 2x24 hours, then concentrated on a waterbath at an adjusted temperature (Sutomo, 2017).

### 4. Fractionation

A total of 50 grams of ethanol extract from glodokan tiang leaves was dissolved with 50 mL of methanol, and stirred until homogeneous. The extract is put into a split funnel, fractionated using a nonpolar solvent, namely n-hexane as much as 50 mL each time fractionation until the n-hexane fraction and methanol fraction are obtained. The methanol fraction obtained is fractionated with a semipolar solvent using ethyl acetate as much as 50 mL each time fractionation, separating the ethyl acetate fraction. The ethyl acetate fractionation is evaporated using a *rotary evaporator*, then concentrated on a *water-bath* until a viscous fraction is obtained (Ansar, 2017).

### 5. Antioxidant Compound Identification Test

A compound identification test is a test to determine the class of chemical

compounds contained in fraction samples. The method of identifying the compounds used is the color reagent test, the chemical compounds to be examined are flavonoids, alkaloids, and polyphenols.

## RESULTS AND DISCUSSION

### 1. Organoleptic Test

The results of organoleptic tests on samples of ethyl acetate fraction of 70% ethanolic extract glodokan tiang-leaves were observed using the five senses taste, smell, color, and texture. This study produced organoleptic fractions with a distinctive aroma, blackish-brown in color, a glossy texture, and a slightly sticky and bitter taste.

### 2. Moisture Test

Testing water content is very important to know the minimum limit of the water content range in a sample, a good water content is <10% (Yuri, 2017), if the water content limit is more than 10% the water content can cause microbial growth so that a good water content <10%. From the results of this study, the results of water content were obtained as follows. Table 1. These results meet the requirements of a good moisture content of <10% (Yuri, 2017).

**Table 1. Water Content Test Results**

| Simplisia | Extract | Faction |
|-----------|---------|---------|
| 5,32%     | 5,26%   | 5,93%   |

### 3. Extract

Simplisia of glodokan tiang leaves was extracted by maceration method for 1 x 24 hours and macerated for 2 x 24 hours. It can be seen in Table 2. The extraction result obtained a yield value of 25.48%, the higher the yield value produced shows the the extract produced is better.

**Table 2. Extraction Results**

| Sample             | Simplisia weights | Extract weights | Extract yield |
|--------------------|-------------------|-----------------|---------------|
| Glodokan tiangLeaf | 884 gram          | 225,267 gram    | 25,48 %       |

### 4. Fractionation

After the extraction process is carried out continued with the fractionation process which aims to separate compounds using solvents based on their polarity level, fractionation results can be seen in Table 3.

The higher the yield value produced indicates that the resulting fraction is better. The yield value is said to be ideal if the value is 100% or more and if it is below 40% it is said to be not good (Anjaswati, 2021).

**Table 3. Fractionation Results**

| Sample              | Extract weight | Fraction Weights generated | Fractional yield |
|---------------------|----------------|----------------------------|------------------|
| Glodokan tiang Leaf | 50 gram        | 6,14 gram                  | 12,28 %          |

### 5. Antioxidant Compound Identification Test

The compounds to be identified are tested using 3 different color reagents to ascertain the chemical compounds contained in the sample.

#### a. Flavonoid

Based on ethyl acetate fraction, 70% ethanol extract of glodokan tiang leaves is proven to contain flavonoids. Proven by using 3 color reagents with 3 times replication shows a positive color reaction containing flavonoid compounds. Results can be seen in table 4.

**Table 4. Flavonoid Identification Results**

| Reagent                    | Color Reaction Results   | Conclusion |
|----------------------------|--------------------------|------------|
| <i>wilstater</i>           | Turns reddish-orange     | Positive   |
| <i>bate smite-metcalfe</i> | Turns brownish-red color | Positive   |
| NaOH 10 %                  | Turns orange             | Positive   |

b. Alkaloid

Based on the results of research that has been done, research on ethyl acetate fraction of 70% ethanol extract of glodokan tiang leaves is not proven to contain alkaloid compounds using color reagents with 3 times replication. There are 3 color reagents carried out showing negative results, can be seen in table 5.

**Table 5. Alkaloid Identification Results**

| Reagent      | Color Reaction Results | Conclusion |
|--------------|------------------------|------------|
| Mayer        | No deposits            | negative   |
| Wagner       | No deposits            | negative   |
| Draggendorff | There are no deposits  | negative   |

c. Polyphenols

Based on the results of research on ethyl acetate fraction ethanol 70% glodokan tiang leaves, proven to contain polyphenolic compounds. This is shown from 3 color reagent tests performed with 3 replications, showing positive results, the results can be seen in table 5.

**Table 5. Polyphenol Identification Results**

| Reagent               | Color Reaction Results                         | Conclusion |
|-----------------------|------------------------------------------------|------------|
| FeCl <sub>3</sub> 1 % | Blackish-green in color                        | Positive   |
| Gelatin 10 %          | A precipitate of white color is formed         | Positive   |
| NaCl + gelatin        | Turbid yellow color, white deposits are formed | Positive   |

## CONCLUSION

The results of the examination of the ethyl acetate fraction of 70% ethanol extract glodokan tiang produce:

1. The organoleptic result of ethyl acetate fraction characteristic aroma, blackish-brown has a glossy texture and is slightly sticky, and has a bitter taste.
2. The yield of fractional moisture content

of 5.93% means that it meets a good water content

3. The positive ethyl acetate fraction contains flavonoid and polyphenol compounds while the negative contains alkaloid compounds.

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