

# Phytochemical Screening of Turmeric (*Curcuma longa* Linn.) Extract With 97% Ethanol Solution

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## Abstract

**Background research** Indonesian people have traditionally used ingredients derived from nature for medicinal purposes which are generally known to be efficacious. Based on this potential, traditional medicinal products can be widely developed, one of which is turmeric rhizome (*Curcuma longa* Linn.). Turmeric is one of the tribal plants found (Zingiberaceae). The most important part of using turmeric is the rhizome. The potential of turmeric plants as medicinal plants raises the idea of conducting research aimed at knowing the content of compounds in turmeric rhizomes. Turmeric in this study was obtained from the city of Payakumbuh, West Sumatra.

**Objective Research** To know the phytochemical screening of turmeric extract qualitatively.

**Research method:** This study is a laboratory experimental study, the turmeric rhizome used comes from Payakumbuh City, West Sumatra using 97% ethanol solvent, the parameters used are in the Indonesian herbal pharmacopeia standard (2008) by testing through phytochemical screening, phytochemical screening method used This is done by looking at the color reaction using several reagents. Data analysis was carried out in a qualitative descriptive way.

**Result research** Phytochemical Test Results Compound Content Turmeric extract contains Phenol with the formation of a purple-blue color, steroids with the formation of a blue color, triterpenoids forming a brownish color, alkaloids forming a brown to black color, and Saponin compounds with stable foam >10 minutes as high as 1-10 cm, if Dropped 1 drop of HCl 2 N foam does not disappear as well as compounds glycosides, tannins, flavonoids and essential oils. **Conclusion** Turmeric rhizome

contains phenols, essential oils, steroids, triterpenoids, alkaloids, saponins and also contains glycosides, tannins and flavonoids.

**Keywords:** phytochemical screening, turmeric extract, ethanol solvent

## Introduction

Turmeric (*Curcuma longa*) is one type of medicinal plant that has many benefits and is found in many parts of Indonesia. Turmeric is a tropical plant native to Asia and has now spread to subtropical areas around the world (Li et al., 2011). The dark yellow powder produced from the rhizome of turmeric is known as turmeric powder, in India, China, and Asia it has long been used as a food ingredient and medicine (Singh et al., 2010). Turmeric rhizome contains a chemical that is a yellow dye called curcuminoids. Curcuminoids can act as antioxidants, which can prevent cell damage caused by free radicals. In addition, curcuminoids can also be anti-inflammatory (Winarto and Tim Lentera, 2004). This plant which has always been the mainstay of traditional medicine is still suspected of having active compounds that have not been identified. The study was carried out by analyzing the content of compounds in turmeric rhizome powder.

## Objective Research

To Know the phytochemical screening of turmeric extract qualitatively.

## Method

### 1. Making turmeric extract

Turmeric rhizome weighing 1.5 kg is dried in the sun to dry, then blended until smooth, and then macerated. Maceration is done by soaking turmeric rhizome simplicia into 2 liters of 97% ethanol for 3 days then allowed to stand in a tight container. Ethanol is used as a solvent for maceration because ethanol solvent has a level of safety and ease of evaporation so it is easy to separate. Ethanol is polar and has properties that can attract secondary metabolites in simplicia with optimal amounts. The remaining simplicia was stirred with a stirrer between the immersion times. After that, it was filtered with filter paper to obtain the first liquid extract. The residue from the first liquid extract was macerated again by immersing it into 1 liter of 96% ethanol for 1 day and stirring. The residue is then filtered to obtain a second liquid extract, which is then combined with the first liquid extract

## 2. Phytochemical testing

Phytochemical test to determine the content of flavonoids, saponins, steroids, alkaloids, phenols, glycosides, tannins, and essential oils.

### a. Flavanoid test

Extract as much as 1 ml of turmeric rhizome extract was put into a test tube, then 2 drops of concentrated HCL were added and shaken vigorously. After that, magnesium powder (Mg) was added and shaken vigorously. Positive samples contain flavonoids if there is foam with a lot of intensity and the solution will change color to orange (Ningtyas, et al., 2015).

### b. Tanin test

1 ml of turmeric rhizome extract was put into a test tube, then 2-3 drops of 1% FeCl<sub>3</sub> were added. Positive samples contain tannins when they change color to blackish green (Ningtyas, et al., 2015).

### c. Alkaloid test

Extract as much as 1 ml of turmeric rhizome extract was put into a test tube, then added with a little HCL 2N solution was heated and added Mayer's solution to form a white or yellow clotted precipitate and with Dragendrof a brown to black precipitate formed, then there is a possibility that there are alkaloids (Depkes RI, 1977).

## Data analysis

Data analysis was carried out in a qualitative descriptive manner.

## Results and Discussion

**Table 1: Phytochemical Test Results for Turmeric Extract Compounds**

Compound content	Reactor	Results	Information
Fenol	FeCl <sub>3</sub>	+	Formation of purple blue color
Atsiri oil		+	
Steroid	asam asetat anhidrat and H <sub>2</sub> SO <sub>4</sub>	-	Blue color is formed
Triterpenoid	asam asetat anhidrat and H <sub>2</sub> SO <sub>4</sub>	-	Formation of brown

Alkaloid	HCl 2 M with reactan Mayer and Dragondrof	-	Formation of a white/yellow lumpy precipitate
Saponin	HCl 2 N	+	there is a stable foam >10 minutes as high as 1-10 cm and when 1 drop of 2 N HCl is added, the foam does not is lost.
Glikosida		-	
Tanin	FeCl <sub>3</sub> 1%	+	Formation of purple blue color
Flavanoid	Mg. HCl concentrated	+	Formation of green color

+ indicates that there are compounds

- indicates that there are no compounds

### Result and discussion :

Turmeric is a plant that has biological activity, one of which can function as an antibacterial, anti-inflammatory, and antidepressant. Secondary metabolite compounds that are often used as indicators of biological activity in plants are flavonoids, alkaloids, and tannins. The results of the phytochemical test of turmeric extract aim to ensure the presence of secondary metabolites contained in turmeric rhizomes (Harborne, 2016). Secondary metabolites found in turmeric rhizomes are compounds that are not directly involved in the growth, development, or reproduction of living things. However, these compounds are commonly used for plant breeding and defense because generally secondary metabolites are toxic to animals, including alkaloids, phenols, saponins, and terpenoids. Turmeric rhizome contains phenols, essential oils, steroids, triterpenoids, alkaloids, saponins and glycosides, tannins, and flavonoids. According to Hariyati's research (2015), turmeric rhizomes contain flavonoid compounds, tannins, alkaloids, essential oils, and curcumin. The extraction process of turmeric simplicia soxhletation produces curcumin which gives a dark yellow color to the extract. Curcuminoids contain curcumin (49.6%), demethoxycuminoid (28.7), and bis-demethoxycurcumin (22.3%). The content of turmeric rhizome consists of alkaloids, flavonoids, and tannins (Maulidya and Sari 2016). These compounds are anti-bacterial. contains active curcuminoid compounds consisting of curcumin, bisdementoxycurcumin and dementoxycurcumin which have anti-fungal properties. Essential oils 3-5% (turmerone, zingiberene, phellandrene, sesquiterpene alcohol and borneol), curcumin, demethoxycurcumin,

bidesmethoxy curcumin, starch, tannin, resin. Turmerone and phellandrene contained in essential oils have functioned as anti-inflammatory, hepatoprotective, antimicrobial, can heal external wounds, anticancer, antitumor, and antiviral. Essential oils can also increase bile flow, effective in bronchial asthma. Essential oils and curcumin have shown that they can heal wounds, and inhibit the activity of pathogenic fungi both in vitro and in vivo. Curcuminoids consisting of curcumin, desmethoxycurcumin, and bisdemethoxycurcumin are commonly used as preservatives and colorants in foods, such as tofu, and as an anti-inflammatory, antioxidant, antiviral, and antifungal agents. The starch in turmeric has activity on the reticuloendothelial system. While tannin is an astringent that is used medically for antidiarrheal, hemostatic, and anti-hemorrhoidal, it can also be used to heal burns, and wounds caused by bee stings, and to stop bleeding. Curcuminoids and essential oils are the main bioactive found in the turmeric plant, with curcuminoids mostly accumulating in the rhizome of the turmeric plant (Li et al., 2011). Curcuminoids is a term for curcumin compounds and their derivatives (Chattopadhyay et al., 2004). According to Sujarwo (2004), the mechanism of curcumin as an anti-inflammatory is to inhibit the formation of prostaglandins.

### **Conclusion :**

Phytochemical test results of turmeric extract Turmeric rhizome contains Phenols, Essential Oils, Steroids, Triterpenoids, Alkaloids, Saponins and Glycosides, Tannins and Flavonoids.

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