

DETERMINATION OF VITAMIN C CONTENTS FROM ETHANOL EXTRACT OF LIME (*Citrus aurantifolia*) PEEL USING UV-VIS SPECTROPHOTOMETRY METHOD

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Abstract

Background: Lime peel is a plant that is used as a traditional medicine, the content contained in the skin of lime fruit, of which is Vitamin C. Vitamin C is a type of natural antioxidant that can ward off harmful free radicals so that it can boost the immune system. **Objective:** The purpose of this study was to measure the levels of vitamin E in the peel of lime (*Citrus aurantifolia*) using the UV-Vis spectrophotometer method. **Method:** The sample used was lime peel. The extraction method used was the maceration method and this type of research was an experiment with direct observation at the laboratory to find out how to find Vitamin C levels in lime peel (*Citrus aurantifolia*) Determination of vitamin E levels in 10 g lime peel samples was carried out using a spectrophotometer: UV-Vis in the wave range 200-400 nm Determination of the calibration curve was determined from the absorbance value standard solution of vitamin C at concentrations of 5 ppm 10 ppm, 15 ppm 20 ppm and 25 ppm. **Result:** The results of the research obtained the maximum wavelength of the Bako Vitamin C solution of 266.05 nm and the absorbance of the sample is 79.005. From the determination of the calibration curve, the regress equation is $-0.0815x + 0.02$ with a value equal to 0.09934. **Conclusion:** From the results of the calculations, it can be concluded that the level of Vitamin C in the peel of lime fruit is 0.0078%.

Keywords: Vitamin C, Lime peel (*Citrus aurantifolia*), UV-Vis spectrophotometry S

BACKGROUND

Lime is a type of fruit that grows widely in Indonesia. It turns out that lime also has many benefits for the health of the body, one of which is as an antioxidant. The lime plant has many benefits for health, one of which is the peel of the lime which contains chemicals that are immunomodulatory or increase immune system. Therefore, it is a shame if waste or wasted materials such as lime peel are wasted if they are not used properly (Fitriawan,2022).

Lime peel is one type of waste that is widely circulated in the environment. Lime peel is also a plant that is used as traditional medicine. The contents of lime peel include flavonoids, alkaloids, saponins and vitamin C which have antioxidant properties(Ismiyyatun dkk, 2019)

Vitamin C is the vitamin most commonly used as an antioxidant. Vitamin C has another name, namely ascorbic acid, which is a water-soluble vitamin and is available in several food sources. Vitamin C at the right dose functions as an effective antioxidant in inhibiting free radicals. Vitamin C is chemically capable of reacting with most free radicals and oxidants in the body. Vitamin C also helps speed up the process of absorbing drugs (Defia, 2020).

The UV-VIS spectrophotometry method can be analyzed using UV and Visible wavelengths as absorption areas to detect compounds. Compounds that can be identified using the UV-VIS spectrophotometric method are compounds that have chromophore groups and ausochrome groups (Sahumena dkk., 2020).

METHODS

This research was carried out in the Pharmaceutical biology laboratory and instrument analysis laboratory, Stikes Nani Hasanuddin.

Determination of vitamin C levels in 10 g of lime peel samples was carried out using UV-Vis Spectrophotometry in the wave range 200-400 nm. Determination of the calibration curve was determined from the absorbance value of the standard solution of vitamin C at concentrations of 5 ppm, 10 ppm, 15 ppm, 20 ppm and 25 ppm. Quantitative test of Vitamin C levels in samples where to find the Vitamin C levels in lime peel is searched using a formula

$$\% \text{ Vitamin C Levels} = \frac{\text{concentration} - \text{volume (L)}}{\text{Sample weight (Mg)}} \times 100$$

RESULTS AND DISCUSSION

Table 1. 1 Results of Absorbance Measurement for 3 Replication Samples

No	Sample Concentration	Absorbansi
1.	10 g	6,1137
		5,9592
		7,1839

Table 1.2.. Result of absorbance measurement of standard solution

No	Ppm Concentration (x)	Asorbansi (y)
1.	5	0,3562
2.	10	0,779
3.	15	1,264
4.	20	1,6557
5.	25	1,9543

Table 2. Quantitative Test of Vitamin C Levels in Samples

Sample	Concentration	Volume (L)	Sample Weight (Mg)	Level (%)
Lime peel extract (<i>Citrus aurantifolia</i>)	79,005	0,05	10,000	0,0078

The first thing to do to determine Vitamin C levels is to make a stock Vitamin C solution at a stock concentration of 100 ppm. The calibration curve is determined from the standard absorbance at concentrations of 5 ppm, 10 ppm, 15 ppm, 20 ppm and 25 ppm. By weighing 0.05 of the stock solution, namely vitamin C and then putting it into a volumetric flask and homogenizing it, after that the concentration is made by taking each solution according to the concentration of the calibration curve from this study. The wavelength of the standard solution of vitamin C is 266. .05 nm. The dilution series of the standard solution is measured on its absorbance at the maximum wavelength obtained using a distilled water blank. The blank aims to adjust the spectrophotometry so that the measurement wavelength has zero absorption. Vitamin C can be measured using UV-Vis Spectrophotometry at this wavelength. 200-400 nm because Vitamin C has a chromophore molecular structure that can absorb UV light

The results of measuring the absorbance of samples from 3 replications or 3 repetitions were entered into spectrophotometry 3 times to obtain replication results first 6.1137, second replication 5.9592 and third replication 7.1839. The sample used must be carried out in 3 replications or 3 repetitions to find out what percentage of Vitamin C levels are in the sample and to optimize the occurrence of errors in sample analysis and measuring free radical scavenging activity.

The results of measuring the absorbance value of the standard solution where in this study 5 replications were carried out with ppm concentrations of 5ppm, 10ppm, 15ppm, 20ppm and 25ppm and the absorbance results obtained from measuring the absorbance of the standard solution for 5ppm were 0.3562.10 ppm 0.779.15ppm 1.264, 20ppm 1.6557 and 25 ppm 1.9543. From the absorbance results obtained it can be concluded that the higher the ppm concentration value, the higher the absorbance value.

Quantitative test of Vitamin C levels in samples with values The average absorbance of samples was 3 replications, the volume value was obtained by changing the amount of solvent used, 50 ml, to liters to 0.05 L, the sample weight value was obtained from the value of the amount of sample used, 10 g was converted to mg to become 10,000 mg. From the calculation results, it was found that the vitamin C content in lime peel was 0.0078%. The

results obtained are in line with the National Standardization Agency as stated in SNI 01-3842-1995 where good Vitamin C levels are not more than 0.05%.

CONCLUSION

Determining the vitamin C content of lime peel extract (*Citrus aurantifolia*) using the UV-Vis spectrophotometric method found Vitamin C levels in the peel of lime fruit (*Citrus aurantifolia*) which was carried out 3 times with sample replication and the ppm concentration from 5-25 obtained the Vitamin content C is 0.0078% and is in line with the National Standardization Agency as stated in SNI 01-3842-1995 where a good level of Vitamin C is no more than 0.05%.

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