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ANTIOXIDANT ACTIVITY OF THE METHANOL EXTRACT OF TURKEY EGGPLANT (*Solanum betaceum* Cav.) INVITRO

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P e n u l i s K o r e s p o n d e n s i

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A B S T R A C T

Duch Eggplant rich in phytochemicals, such as polyphenols, flavonoids, and carotenoids. Studies have demonstrated the powerful antioxidant activity of these compounds, which can shield body cells from free radical-induced oxidative damage.The aim of this study is to determine the IC50 value of the antioxidant activity present in the skin of the Holland turnip. This study also has implications for human health. Knowing the anti-oxidant skin activity in the inviter allows us to estimate the potential benefits of protecting the body from oxidative damage. 1.1-diphenyl-2-picrylhydrazil (DPPH) is the method employed. This method involves measuring the ability of the extract to neutralize the free radicals in DPPH. We will observe the color changes from purple to yellow and evaluate the free radical's capture capacity based on the degree of color change. The study's findings revealed an IC_{50} value of 41,019 ppm. The conclusion from the IC50 values obtained is that the methanol extract in the skin of the Dutch teranga has an antioxidant activity that is very strong to counter free radicals.

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INTRODUCTION

Free radicals are molecules that are unstable and highly reactive because they contain one or more unpairing electrons in their outer orbit. Then, for stability, free radicals need a donor of one electron, an antioxidant compound (Ozturk et al., 2024). The human body continuously forms free radical reactivity, which the antioxidant system recognises. However, under certain circumstances, the body cannot cope with it on its own, so it needs antioxidants from outside the body to prevent the occurrence of such free radical reactive reactions. An antioxidant functions by donating one of its electrons to an oxidative compound, thereby inhibiting the oxidant's activity (Surya, 2019), (Kartini et al., 2023)(Pratama & Busman, 2020)

Indonesia has a tropical climate that is rich in a variety of plants. We have not yet fully explored and maximized the presence of medicinal plants. (Sukweenadhi et al., 2020). One of them is the Solanum betaceum cave. It is a member of the Solanaceae family of herbaceous plants. As a cormesial value plant, the Dutch turnip requires both quality and quantity development. Indonesia's high plains, with their suitable weather conditions for Dutch fruit growth, abundantly produce Dutch turnip. (Kartini et al., 2023).(Firmansyah & Duppa, 2022)

The fruit is rich in nutrients and chemicals required by the body, including vitamins (A, B1, B2, B6, C, and E), carotene, and flavonoid compounds. You can use this plant as a natural antioxidant for fever, sickness, constipation, heart disease, and cancer prevention. (Putu Widayanti dkk., 2016).(Dwi Sandhiutami et al., 2021) The underutilized portion of the skin turns into waste. (Suzanna et al., 2019)

From previous studies according to Putu Widayanti dkk., (2016) extract of ternage skin with n-butanol fraction in vitro with known positive contains flavonoid compounds with results 69.89 mg/L. Quantitative analysis shows that n-butanol fractions have strong antioxidant activity, Compounds that have IC50 values ranging between 50-100 mg/l belong to antioxidants that have strong activity. With this study, using natural ingredients from Dutch tuber skin as an antioxidant for free radicals inhibitors with the title “Antioxidant Activity of methanol extract in Dutch Tuber skin (Solanum betaceum Cav.) by method 1.1 – dipheny – 2 – picrylhydrazyl (DPPH)”. Antioxidant testing with DPPH will produce an IC50 (Inhibitor Concentration) value that indicates how much concentration of the extract is needed to reduce free radical (DPHP) as much as 50%. (Surya et al., 2023)

RESEARCH METHODS

Sample Extraction

We wash the samples, thinly chop them to separate the meat from the fruit, and then dry them at room temperature. The process involves storing 10 grams of finely peeled Dutch tuber leather in a dark bottle. The useBy using dark bottles, you can minimize exposure to light, which can destroy light-sensitive compounds like pigments or easily oxidized compound compositions, reduce extraction efficiency, and accelerate the degradation of the desired active ingredients. Next, you add methanol as a solvent to extract the active substances from the sample, soaking and silencing it for three consecutive 24 The sample

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results are then filtered using filter paper. Test antioxidant activity with the DPPH method(Yunita & Sari, 2022)(Surya & Marliza, 2020)(Baliyan et al., 2022)

Test activity with DPPH method

We performed the antioxidant activity test using a microplate reader with a two-fold delution using the DPPH method (2.2-diphenyl-2-picrylhydrazyl) at 520 nm wavelength. We dissolve a sample of 2 mg in 2 mL of methanol to achieve a sample concentration of 1000 ppm. A row is inserted with a sample of 100 µL (plates consisting of rows A–HH each of 12 wells). A total of 50 µL of methanol is inserted in each well in rows B–HH. Row A is tricked in 50 µl and carried out to row B; line B is tricked in row C and done until row F; line F is tryked in a row of 50 µL and then discarded, thus obtaining a concentration of 1000 ppm, 500 ppp, 250 ppm, 125 ppp, 62,5 ppm, and 31,25 ppm. A-G lines are added to 80 µL of DPPH at a concentration of 40 ppm, then incubated for 30 minutes. A microplate reader measures the radical capture activity as a decrease in DPPH adsorption and records the resulting data (Salim, 2020)

Analysis determines the percentage of inhibition (IC5o) by creating a correlation curve between the barrier percent and the concentration. You can calculate the value of inhibition using the following formula:

$$\% \text{ inhibisi} = \frac{A\,control - A\,sample}{A\,control} \times 100\%$$

Information:

A control = Absorption no containing sample

A sample = Absorption containing sample

The linear equation formula is as follows:

$$Y = ax + b$$

Information :

Y = Absorption sample

*A*x = Sample concentration

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Data Analysis

We perform data analysis by measuring the adsorption of the sample and using the percentage inhibition formula. Data is analysed by making a calibration curve and then inserted into the linear regression equation of the solution concentration with % inhibition and then the IC_{50} value

RESULTS AND DISCUSSION

Using the DPPH method and a microplate reader 96-well (Berthold Technologies) at a wavelength of 520 nm to look at antioxidant activity gave us the IC50 value shown in Table 1.

Table 1. Antioxidant Activity of Dutch Eggplant Skin

Sample Concentration (ppm)	ln Kons	%Inhibisi	IC_{50} (ppm)
1000	6,90776	86,6815	
500	6,21461	83,4628	
250	5,52146	82,131	
125	4,82831	81,1321	41,019
62,5	4,13517	54,717	
31,25	3,44202	35,6271	

Free radicals in the body cause oxidative damage, which antioxidants effectively combat by preventing a variety of diseases. With a microplate reader 96 well (berhold technology) at a wavelength of 520 nm, the study aims to find out how well the methanol extract from the Dutch tubular skin fights DPPH as an antioxidant. We calculated the IC50 value to determine the antioxidant activity of the sample.

First, we clean the leather sample and then dry it until we achieve a constant weight. Next, we weigh the sample to 10 grammes, place it in a dark bottle, and immerse it in a methanol solvent. Metanol is a solvent capable of dissolving polar compounds. We then submerged the sample three times for 24 hours.

This study employs the free radical inhibition method of 1,1-diphenyl-2-picrylhydrazil (DPPH) as the antioxidant activity test method. This method requires a small sample and is easy, fast, and sensitive to evaluate the antioxidant activity of natural compounds (Hudaifah, 2020). The DPPH method was used to measure antioxidant activity using a microplate reader with a two-fold delution at 520 nm wavelength. We used a number of concentrations in this test: 1000 ppm, 500 ppm, 250 ppm, 125 ppm, 62.5 ppm, and 31.25 ppm. We determine the

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antioxidant activity of the sample by measuring the magnitude of the DPPH radical barrier to obtain an IC50 value.(Sholekah, 2017)

We obtain the IC50 value using a linear regression equation by plotting the relationship between the sample concentration (symbol x) and the capture activity of the flat-radical (y symbol) in the replication series of the measurement. A substance that has antioxidant properties is very strong when the IC50 is less than 50 ppm, strong when the IC50 value is between 50 and 100 ppm, and weak when the IC50 value varies between 100 and 150 ppm. Substances with IC50 values over 200 ppm are very weak antioxidants (Musdalipah et al., 2021) (Handayani dkk., 2014)

CONCLUSION

A study of antioxidant activity on an invitro sample of Dutch tuber skin using the 1,1-diphenyl-2-picrylhydrazyl (DPPH) method has concluded that Dutch Tuber skin extract has very strong antioxidants with an IC50 of 41,019 ppm.

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