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Effect Of Anting-Anting Leaf Extract (Acalypha Indica L.) On Lowering Blood Glucose Rats (Rattus Norvegicus) Induced By Sukrosa

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ABSTRACT

Anting-anting leaves (Acalypha indica L.) are weeds that have various properties, one of which is as a lowering blood glucose levels. The chemical content contained in the form of flavonoids that function as inhibitors of α-glucosidase, maltase, α-amylase enzymes, tannin substances are also known to function as astrigents that can inhibit glucose intake is not excessive. The purpose of this study is to determine whether there is an effect of anting-anting leaf extract (Acalypha indica L.) on reducing blood glucose levels in rats (Rattus norvegicus) induced by sucrose. This research used 20 rats (Rattus norvegicus) as test animals which were divided into 5 groups. The group consisted of negative control group, positive control and 3 dose groups. The doses used were 500 mg/kgBB, 1000 mg/kgBB and 1200 mg/kgBB. Mice were made hyperglycemia with sucrose induction which was then given anting-anting leaf extract (Acalypha indica L.) according to lower glucose levels in mice. The results obtained were continued with the two-way ANOVA test and obtained significant results indicated by $p < 0.05$ (0.005) which showed there was a significant effect of anting-anting leaf extract (Acalypha indica L.) on reducing blood glucose levels in sucrose-induced rats (Rattus norvegicus). Significant results were continued with the post hoc test and obtained significant results.

Keywords: Anting-anting Leaves (Acalypha indica L.), Blood Glucose

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INTRODUCTION

Diabetes Mellitus or diabetes is a chronic disease that can last a lifetime. This disease is caused by metabolic disorders that occur in the pancreas, characterised by an increase in blood glucose. Such a condition is called hyperglycaemia, which is caused by a decrease in the amount of insulin from the pancreas. (Lestari et al., 2021). The global prevalence of Diabetes in 20-79 year olds in 2021 is estimated to be 10.5% (536.6 million people), increasing to 12.2% (783.2 million) in 2045. The largest relative increase in Diabetes prevalence between 2021 and 2045 is expected to occur in middle-income countries (21.1%). Indonesia is fifth with 19.47 million people with

diabetes with a population of 179.72 million, the prevalence of Diabetes Mellitus in Indonesia is calculated at 10.6%. (IDF, 2021).

Diabetes mellitus can be treated with insulin or by consuming drugs both traditionally and modernly. The use of synthetic anti-diabetes drugs in combination is likely to have unwanted side effects because it is used for a relatively long time. Traditional medicines can be another option for Diabetes Mellitus therapy, the use of traditional medicines is considered safer and can minimise side effects on the body. Diabetes Mellitus (DM) treatment is a long-term and expensive treatment. People need to look for anti-diabetic drugs that are relatively cheap with little side effects. Treatment or oral antidiabetic drug therapy Diabetes Mellitus (DM) which is often used as a blood glucose lowering is metformin, long-term use of cystic drugs can cause several side effects. Side effects can include impaired renal function caused by drugs that must be taken regularly to keep blood glucose stable (Gumantara & Oktarlina, 2017).

Alternative drug therapy that can be tried is by conducting research on traditional drugs that have hypoglycaemia effects. Earring leaves contain flavonoids and tannins as active ingredients. Flavonoid compounds are antidiabetic with the mechanism of lowering blood glucose levels which act as inhibitors of α-glucosidase, maltase, and α-amylase enzymes and can protect pancreatic β-cells as insulin producers so as to increase insulin sensitivity. Tannin compounds function as astrigents that can inhibit the absorption of food juice in the intestinal epithelium so as to inhibit excess glucose intake. The compounds contained in earring leaves as Diabetes Mellitus therapy are not widely known and utilised. (Islamiyati & Lina, 2019).

Based on this, researchers conducted this study to determine the effect of earring leaf extract as an alternative to oral antidiabetic drugs that lower blood glucose levels in sucrose-induced mice.

METHOD

The type of research used is quantitative research and the design used in this study is Laboratory Experimental conducted to determine whether there is an effect of Anting-anting leaf extract (Acalypha indica L.) on reducing blood glucose levels in rats (Rattus norvegicus) induced by sucrose. The sampling technique uses the inclusion criteria technique. The samples taken from this study were male mice aged 2 months, healthy, and had a body weight of about 150-200 grams as many as 20 heads.

Research Tools and Materials

The tools used in this study are: Animal rearing cages, animal drinking water containers, glassware, blender, sieve, analytical scales, filter paper, hot plate, NGT (nasogastric tube), 3ml disposible syringe, sudip, pipette, scissors, glucometer (Easy Touch). The materials used in this study: Earrings leaves (Acalypha indica L.), 96% ethanol, distilled water, sugar, metformin, animal feed, drinking water and rat venous blood (Rattus norvegicus).

Simplisia Preparation

Earring leaves were washed under running water. The washed earring leaves will be sliced. Earring leaves are then sliced into small slices. Then dried at room temperature, puree with a blender until smooth, then filtered.

Preparation of Earring Leaf Extract

Earring leaves that are already in powder or simplisia form are weighed as much as 80 grams, Extraction using 800 ml of 96% ethanol. The maceration process is carried out for 3 days (every day is cornered), the resulting extract is filtered using filter paper. Volume reduction is done using a hot plate.

Rat venous blood sampling

Venous blood of mice is done by taking blood using a syringe inserted into the tail of the rats.

Preparation of sucrose solution

Weigh as much granulated sugar as much as 9.6g. Dissolve in distilled water as much as 20 ml

Testing

Mice were divided into 5 groups, each group consisting of 4 mice. All mice are acclimatised for 7 days to adjust to the environment. Weigh the body weight of the mice and marked. Mice are satisfied for 8 hours (still given a drink). On the second day, the fasting blood glucose level of each rat was measured by taking venous blood from the tail. All rats were induced with sucrose solution according to their body weight. Blood glucose levels were checked again after 30 minutes. Administration of the preparation per oral to mice that have been induced sucrose.

Group I : 1 ml distilled water as negative control
Group II : metformin 1.3 mg/20g as positive control
Group III : earring leaf extract 1.3 mg/20g
Group IV : earring leaf extract 1.9 mg/20g
Group V : earring leaf extract 2.6 mg/20g

Blood glucose levels of rats will be checked again after giving preparations according to the groups above.

FINDING AND DISCUSSION

The results of the examination of fasting blood glucose levels of mice can be seen in table 1 above. The average blood glucose level of mice during fasting is 73.6 mg/dl. Fasting blood glucose levels in mice are said to be normal if 73-96.6 mg/dl. The results of mice blood glucose levels after sucrose induction increased by 165.5 mg/dl. Mice are said to be hyperglycaemic if > 126 mg/dl. Examination of blood glucose levels after 30 minutes of treatment according to the group decreased to 122.6 mg/dl.

Table 1. Results of blood glucose test

No	Treatment groups		GDP 1	GDP 2	GDP 3
1.	Negative control	N1	112	282	226
2.		N2	76	137	134
3		N3	88	149	172
4		N4	96	231	220
5	Positive control	P1	86	143	100
6		P2	63	201	154
7		P3	74	102	80
8		P4	61	141	86
9	Dose (I)	D (I) 1	46	146	117
10		D (I) 2	63	106	97
11		D (I) 3	59	230	127
12		D (I) 4	82	284	117
13	Dose (II)	D (II) 1	91	173	138
14		D (II) 2	73	177	122
15		D (II) 3	49	160	127
16		D (II) 4	93	135	71
17	Dose (III)	D (III) 1	83	107	60
18		D (III) 2	67	154	108
19		D (III) 3	57	149	124
20		D (III) 4	53	103	72
	Mean		**73,6**	**165,5**	**122,6**

The results of blood glucose examination after dosing according to the group decreased due to the administration of earring leaf extract (Acalypha indica L.) at a dose of 1.3 mg/BB, 1.9 mg/BB and 2.6 mg/BB. Earring leaves contain flavonoid compounds that have antihyperglycaemia properties, flavonoid activity can reduce blood glucose levels by protecting pancreatic β cells as insulin producers so as to increase insulin sensitivity.

According to Alfaridz et al (2016) Flavonoids are secondary metabolites of polyphenols that have several benefits including as antidiabetics. The mechanism of flavonoids as antihyperglycaemia compounds reduces blood glucose levels by protecting pancreatic β-cells as insulin producers so as to increase insulin sensitivity.

According to research from Mu'nisa et al (2020), flavonoids also have antioxidative properties and play a role in preventing cell damage due to reactive free radicals. Flavonoids act as antioxidants by donating their hydrogen atoms or binding to free radicals.

The data obtained from the normality test using Saphiro Wilk and obtained significant results> α. From these significant results continued with the two-way

ANOVA test. The result of the two-way ANOVA test is 0.005. These results are declared significant because (p value) < α (0.05). ANOVA test resulted in a significant difference (H1 accepted) there is an effect of earring leaf extract (acalypha indica L) on lowering blood glucose levels of rats (rattus norvegicus). The significant results were continued with the post hoc test to find out further which groups had different meanings. Post hoc test results. The post hoc test explained that the three dose groups of earring leaf extract had comparable activity with the positive group. The higher the dose given, the better the reduction in blood glucose levels in rats (rattus norvegicus).

Table 2. Post Hoc Test Results

Uji *post hoc*		Significance value	Description
Negative	Positive	0,002	there is an effect
	Dose I	0,005	there is an effect
	Dose II	0,005	there is an effect
	Dose III	0,001	there is an effect

The decrease in blood glucose levels is getting better if the dose is higher due to the flavonoid content in the earrings leaf extract (acalypha indica L) which is increasingly causing insulin sensitivity to increase. Putri et al (2017) stated that at small concentrations, the compounds contained in the extract, namely flavonoids, have less influence and a longer way of working in reducing blood glucose levels in rats, while larger concentrations have more influence and a faster way of working in reducing blood glucose levels by increasing insulin sensitivity in pancreatic cells. β In line with the research of Islamiyati and Lina (2019) using earring leaf extract tested on rats, the best reduction in blood glucose levels was shown at the highest dose of 3.9 mg /gBB.

CONCLUSION

From the results of research conducted on rats treated according to 5 groups after being induced and seen the decline in blood glucose can be concluded that: There is an effect of earring leaf extract (Acalypha indica L) on reducing blood glucose levels in rats (Rattus norvegicus) induced by sucrose.

DECLARATION/STATEMENT

1. Author Contribution
   The first author's contribution is to conduct research, analyse data and prepare the journal. The contribution of the second author is to prepare tools and materials and conduct research.
2. Ethics
   This research has received ethical approval from the Health Research Ethics Commission of STIKes Ngudia Husada Madura No. 1630/KEPK/STIKES-NHM/EC/V/2023)

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