

The Antidiabetic Activity of *Ficus Carica Folium* in *Mus Musculus*

Andri Priyoherianto^a, M. Erik Saputra^a, Cikra Ikhdha Nur Hamidah Safitri^{a,b*}

^aAcademy of Pharmacy Mitra Sehat Mandiri Sidoarjo, Indonesia

^bFaculty of Pharmacy Universitas Gadjah Mada, Yogyakarta, Indonesia

Corresponding Author: Cikra Ikhdha Nur Hamidah Safitri

Email : cikraikhda@gmail.com

Abstract: Tin leaf (*Ficus carica folium*) is the fig tree plant. The fruit and the leaf of this plant rich of polifenol antioksidant such as flavonoid, can used for to reduce the level of blood sugar. To know the activity on Tin leaf (*Ficus carica folium*) toward the reduction of blood sugar to Mice (*Mus musculus*)

This research is experimental, the mice divided into six group. there are Normal group, K group (CMC Na 1%), variation dose 100 mg/kg group, Variation dose 300 mg/kg group, variation dose 600 mg/kg group and positive group (Glibenclamide 0.65 mg/kg). using two way anova analysis method.

the result of this research show reduction effect of mice's blood sugar on 100 mg/kg dose (17.3%), 300 mg/kg dose (29.3%), 600 mg/kg dose (35.2%) and the positive group (44.3%). Variation dose 600 mg/kg (35.2%) give the highest blood sugar reduction, which close to positive group (44.3%) compared with the 100 mg/kg dose (17.3%), 300 mg/kg dose (29.3%).

Keywords: Tin leaf, blood sugar, Mice

Date of Submission: 02-04-2018

Date of acceptance: 17-04-2018

I. Introduction

Indonesia is an archipelago country, has many tribes and customs in Indonesia. many kinds of diseases that exist in Indonesia one of them Diabetes melitus (DM). According to International diabetes federation (IDF) Diabetes mellitus (DM) is the largest disease in Indonesia, from global data shows that diabetes mellitus disease in Indonesia reaches 366 million people, if no invitation to prevent or cope with diabetes mellitus disease will reach 552 million people year 2030 (IDF, 2011). WHO's 2014 health report reported that 9.2% of the world's population experienced more than 25 years of fasting blood glucose (WHO, 2014). DM is a silent killer because this disease can affect everyone. Diseases that will be caused from vision problems, cataracts, heart disease, kidney disease, sexual impotence, difficult and rotting wounds or gangrene, lung infections, vascular disorders, stroke and so on. Diabetics Who Have Been Parahnya Many Members of Public Bodies Happened Form of Decay (MOH, 2005). The danger of diabetes mellitus will be used insulin drugs and other oral diabetes drugs. Medicines that are used are more expensive because they are used in the long term, can also cause unwanted side effects. Therefore, it is necessary to look for effective materials, side effects are relatively cheaper. Efforts in preventing, menundah diabetes mellitus is to use plants as ingredients of medicine. Plants that have an effect on losing blood Glucose levels are Tin leaf. Tin Leaves (*Ficus carica folium*) grow in tropical or subtropical areas. Generally known as the fig tree. These fruits and berries are rich in antioxidant polyphenols such as flavonoids to prevent free radical damage. Part of the plant can be used for treatment, as a remedy to overcome digestive disorders, respiratory disorders, liver disorders, spleen disorders, gout, anti-inflammatory, antipyretic, antidiabetic, lowering blood, even as anticancer (Tiono, 2016). Previous research that leaves the Tin (*Ficus carica folium*) has the effect of being hepatoprotective, hyperlipidemic, anticancer, immune system, antioxidant, antipyretic, antibacterial, antifungal and hyperglycemic (Joseph et al, 2011). Based on this background, this study yielded Tin leaf (*Ficus carica folium*) with Texas blue giant max varieties that grew in queue area, such as blood Glucose to mice (*Mus musculus*) by using 70% ethanol maseration method.

II. Method

1. Collection of raw materials
Leaves are obtained from the Krian region.
2. Simplicia Process
Tin leaves are cleaned, washed, chopped, dried to dry simplicia. after that in powder with blender.
3. Making Tin Leaf Extract

700 g of Tin leaf simplicia powder inserted in beaker glass then given n-heksan until submerged, soaking done for 3 days. After that filtered and dregs were given 70% ethanol 1.4 L. Maseration was done for 5 days, while the remaseration was given 70% ethanol then filtered until the extract colored until clear. the process is carried out in a room protected from sunlight and often stirring. The result is filtered with filter paper in a porcelain dish then concentrated with a waterbath at a temperature of 400 C until it becomes thick maserate.

4. Free Test of ethanol
The extract added concentrated sulfuric acid then heated, if there is no odor of ester means on the extract there is no ethanol (Yuliani, 2014)
5. Phytochemical Screening
Identification of triterpenoid compounds A total of ± 1 ml of extract is included in the test tube. Then coupled with anhydrous acetic acid and concentrated sulfuric acid. If the colored purple or orange color indicates the presence of a triterpenoid (Nafisah, et al 2014).
Identification of flavonoid compounds A total of ± 1 ml of extract is included in the test tube. Then added with 5 drops of ethanol, then shaken until homogeneous. Add 5 drops of concentrated HCl. If it produces yellow, orange, and red colors indicate the presence of flavonoids (Nafisah, et al 2014).
6. Preparation of tin leaf extract
Preparation of leaf extracts that have been done phytochemical screening, divided into 3 parts dose, among others, 100 mg / kg, 300 mg / kg, and 600 mg / kg.
7. Preparation of test animals
Preparation of diabetes mice, alloxan induced mice as much as 180 mg / kg body weight with the volume of 0.1 ml / 10 g BB (Pasaribu, et al 2015). if blood Glucose levels of mice more than 200 mg / dL are categorized as DM (Ridwan, et al., 2012). Mice as many as 30 tails divided into 6 groups, one healthy group (S) as normal control. While 5 groups have been induced alloxan 180 mg / Kg BB by gavage. Treatments with 100, 300 and 600 mg / kg leaf extracts were given to groups A, B and C. 1% CMC suspension was given to group K, while glibenclamide was given to group 0 (positive control) with a dose of glibenclamide 0.65 mg / Kg BB mice (pasaribu, et al. 2012).
8. Analysis
Data analysis use descriptive method by comparing the treatment result in positive control group and normal control. Using Two Way Anova analysis data with 95% confidence level.

III. Result and Discuss

700 g of simplicia powder was extracted with 70% ethanol solvent as much as 1.4 L by maceration method, then evaporated with waterbath in temperature range 500C - 600C to obtain 362.5 g thick viscous extract. The solvent used is ethanol which is a universal solvent, is expected to attract the soluble compound in non-polar solvent to polar (Mukholifah, 2014). Based on phytochemical Screening done can be known that Tin leaf extract contains flavonoid compound and does not show triterpenoid compound. The results of the Tin leaf extract screening are shown in Table 1

Table 1. Phytochemistry Screening

Assay	Reagent	Result	Interpretation
Triterpenoid	CH ₃ COOH+H ₂ SO ₄	No colours change (not orange form)	Negative
Flavonoid	Mg + HCl + ethanol	Orange Form	Positive

The flavonoid compound in the tin leaf extract was identified using Mg as a reducing agent, the reduction was performed in an acidic atmosphere with the addition of HCl. Reduction with concentrated Mg and HCl results in a deep red color in the extract (Nirvana et al., 2015). The induction of this study using the Aloxan 180 mg / kgBB alloxan working mechanism resulted in damage to the pancreatic β cell mainly attacking cellular compounds containing sulfidryl groups, cysteine amino acids and proteins binding to SH groups (including enzymes containing SH groups). The alloxan reacts with two SH groups binding to the sides of proteins or amino acids to form disulfide bonds to inactivate proteins that result in impaired protein function (Prameswari, 2014).

Table 2 Effect Tin Leaf of Blood Glucose Levels in Mus musculus

Groups	Blood Glucose Levels					
	Times					
	H0 (72 After Induction)	H1 (1 hour after treatment)	H2	H3	H4	H5
Normal	283.0± 3.9	285.0±4.4	287.8±4.1	291.2±5.1	293.6±5.8	302.0±9.9
Control Negative	282.0±2.9	286.6±4.5	289.4±4.9	294.4±5.7	301.0±3.2	308.2±5.9
100mg/Kgbb	282.6±2.8	279.2±2.4	266.8±7.0	258.8±9.9	256.4±4.8	233.6±5.4
300mg/Kgbb	281.0±1.0	271.8±9.5	263.0±4.3	247.8±5.8	215.8±3.8	198.6± .0
600mg/Kgbb	287.2±2.2	273.2±4.0	239.6±3.6	216.8±5.0	192.0±7.2	186.2± .8
Glibenclamide	286.6±1.7	278.2±3.1	243.0±3.5	204.6±2.1	190.4±3.2	159.6±5.0

Based on Table 2 it can be seen that there is a decrease in blood Glucose levels on a daily basis. The mean percentage of decrease in blood Glucose level of mice after induced in the Normal group was -6.7%, negative control was -9.3%, group 100 mg / kg 17.3%, 300 mg / kg 29.3%, 600 mg / kg 35.2% and glibenclamide group of 44.3%. Based on the results of the study it can be seen that the percentage decrease in each group Normal, Negative Control, Dose 100mg / Kgbb, Dose 300 mg / Kgbb, Dose 600 mg / Kgbb and glibenclamide consecutively is -6.7; -9.3; 17.3%; 29.3%; 35.2% and 44.3%%. The largest decrease in Glibenclamide was 44.3% and Tin Leaf Extract at dose of 600 mg / kgBB with percentage of 35.2%.

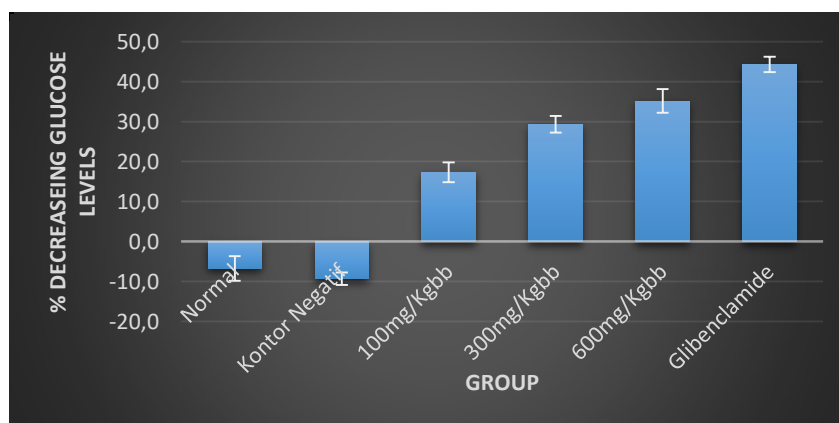


Figure 1. Percentage of Decreasing Blood Glucose Levels

Flavonoids are known to be able to capture free radicals or function as natural antioxidants. The antioxidant activity allows the flavonoids to capture or neutralize free radicals. associated with phenolic OH groups so as to improve the state of damaged tissue in other words the inflammatory process can be inhibited. Flavonoids are reported to have antidiabetic activity that is capable of regenerating cells on the island of Langerhans (Prameswari, 2014) The mechanism of action of glibenclamide forms the bonding of drug molecules with receptors in beta cells, the bonds formed can stimulate insulin secretion from the beta cells of the langerhans island of the pancreas.

Based on statistical analysis using multilayer variant analysis that is two way anova with dose variable and observation time using Kruskal-Wallis Test can be seen that there is difference between treatment group with significance value 0.000 (<0,05). Statistical analysis on percentage reduction using variant one way anova analysis known that the data is normal and homogeneous with sig value. normality and homogeneity greater than 0.05.

Table 4 Two way anovaAnalysis
Levene's Test of Equality of Error Variances^a

F	df1	df2	Sig.
2.927	35	144	.000

The value of P value is indicated by the value of Asymp. Sig of Kruskal wallis test if the value of P value <0.05 research then the decision of hypothesis is to accept H1 and reject H0 or that means there is influence of independent variable to dependent variable. Based on the value of Kruskal wallis Asymp. sig 0.00 <0.05 then There is a significant influence on giving Tin leaf extract on blood Glucose level of mice.

Table 5 Kruskal wallis
Test Statistics^{a,b}

	kadar
Chi-square	103.665
df	5
Asymp. Sig.	,000

IV. Conclusion

The Conclusion in this study Tin leaf extract (*Ficus carica folium*) was able to lower blood sugar levels in Mice (*Mus musculus*) diabetes.

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