

## **Aethanol Extract Of Syzygium Polianthum (EEDS) To Decreases Blood Glucose Level in sprague Dawley Rat With DM**

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### **Abstract**

Diabetes Mellitus (DM) is a chronic disease characterized by blood glucose levels higher than normal. Hyperglycemia increases the synthesis process or decrease the degradation of extra cellular matrix such as fibronectin. High glucose levels and last a long time, will affect the function and structure of various tissues in the body, including proteins in cells. *Syzygium Polianthum* extract is an antioxidant that can be used to decreasing glucose level in the blood. This study used experimental animals of Sprague Dawley rats which were injected with a dose of 40 mg / kgBB Streptozotocin i.p. Experimental animals were divided into 4 (four) groups, namely the control group and 3 treatment groups. To the treatment group, bay leaf extract was administered. The results observed were blood glucose checks are examined using blood tests in the laboratory. The results of the analysis using the t dependent test on differences Glukose level Pre EEDS with Post EEDS showed that there were significant differences between Pre EEDS and Post EEDS (p value: 0.006). This shows that the increased bay leaf dosage can regulate blood sugar. This shows that administration of EEDS to diabetes mellitus can reduce glucose level levels.

**Keywords: Glucose Level, EEDS, diabetes mellitus.**

### **BACKGROUND**

The World Health Organization (WHO) predicts that in 2030 the number of people with diabetes mellitus in the world will reach 388 million and in Indonesia will reach around 21.3 million. The International Diabetes Federation Agency (IDF) estimates an increase in the number of people with diabetes mellitus from 7.0 million in 2009 to 12.0 million in 2030. (Suharmiati, 2012).

Diabetes Mellitus (DM) is a chronic disease characterized by blood glucose levels that exceed normal and impaired carbohydrate, fat, and protein metabolism caused by a relative or absolute deficiency of the hormone insulin. The characteristic sign of DM is hyperglycemia with fasting glucose levels higher than 110 mg / dL. Normal fasting serum glucose levels are 70 to 110 mg / dL. Hyperglycemia results in failure of insulin work, insulin secretion or both. (Rujianto, & ADA 2005).

Relation to blood sugar levels which is the cause of tissue damage. High glucose levels and last a long time, will affect the

function and structure of various tissues in the body, including proteins in cells. Tissue damage caused by exposure to high glucose does not attack all cells in the body, only target cells are damaged such as endothelial capillary cells in the retina, mesangial cells, nerves and shawan cells in the peripheral nerves. Mecansme of tissue damage due to hyperglycemia occurs through 4 pathways, namely increased fluk and polyols, increased production of AGEs, activation of protein kinases (PKC), and increased hexosamine. (Bowie, 2006).

The ability of hyperglycemia in vivo in changing various substrates is a cause of tissue damage. In addition, tissue damage is triggered due to the formation of free radiacal. Hyperglycemia causes glucose auto-oxidation, protein glycation, and activation of polyol metabolic pathways that accelerate reactive oxygen compounds (ROS). The formation of reactive oxygen (ROS) will increase modification of lipids, DNA, and proteins in various tissues. This molecular modification causes an imbalance

of protective antioxidants and the production of free radicals called oxidative stress.(Liu,2009).

The body needs endogenous antioxidants that can inhibit the damage. One of the vegetable ingredients used for DM therapy is bay leaf (*Syzygium polyanthum*). Bay leaves have a hypoglycemic effect, the results of chromatographic tests show the presence of flavonoid compounds in bay leaves. The group of these compounds has sugar groups in the form of glycosides, which function as antioxidants that can prevent the oxidation of body cells.(Studiawan, wahyono, 2008)

## METHOD

This research is a true experimental study using a post test only control group design approach. The design of this study provides efficient implementation of research and provides opportunities for experimental animals to be good during relatively high experiments, because observations and research specimen collection are only conducted at the end of the study. Determination of the sample for each group is done by random allocation.

This study used experimental animals of Sprague Dawley rats which were injected with a dose of 40 mg / kg BB Streptozotocin i.p. Experimental animals were divided into 4 (four) groups, namely the control group and 3 treatment groups. To the treatment group, bay leaf extract was administered. The results observed were blood glucose levels.

## RESULT

**Table1. Phytochemical Test Results of Ethanol Extract of Salam Leaves**

Glucose level	Mean $\pm$ SD	p value	Number
Pre EEDS	356,5 $\pm$ 121,47	0,0006	16
Post EEDS	332,5 $\pm$ 149,15		

**Table 2. Blood Sugar During Pre EEDS and Post EEDS**

The results of the analysis using the t

Parameter	Ekstrak
Alkaloid	Positif
Saponin	Positif
Quinon	Positif
Fenolik	Positif
Triterpenoid	Positif
Steroid	Positif
Flavonoid	Positif

dependent test on differences in the average GDS Pre EEDS with GDS Post EEDS showed that there were significant differences between GDS Pre EEDS and GDS Post EEDS (p value: 0.006). This shows that the increased bay leaf dosage can regulate blood sugar.

## DISCUSION

Bay leaf extract contains alkaloids, saponins, quinones, phenolics, triterpenoids, steroids and flavonoids. Oxidative stress has a role in the development of DM complications. Based on the results of the study, that flavonoids as a group of phenolic compounds that have antioxidant properties and play a role in preventing cell damage and cellular components by reactive free radicals. (Santish,2013, )

The role of flavonoid antioxidants by donating hydrogen atoms or through their ability to chelate metal, in the form of glucosides (containing glucose side chains) or in a free form called aglycones. Bay leaves have a hypoglycemic effect, the results of chromatographic tests show the presence of flavonoid compounds in bay leaves. (Yohana, 2008, Kusuma, 2011, Muin, 2011)

The group of these compounds has sugar groups in the form of glycosides, which function as antioxidants that can prevent the oxidation of body cells. Based on the results of the study, that flavonoids as a group of phenolic compounds which have antioxidant properties and play a role in preventing cell damage and cellular components by reactive free radicals. The role of flavonoid antioxidants by donating hydrogen atoms or through their ability to chelate metal, in the form of glucosides (containing glucose side chains) or in a free form called aglycones. The form of flavonoid compounds in bay leaves such as gallic acid, eugenol, kaempferol and quercetin which contribute to antioxidants. The potential for antidiabetic activity through inhibition of alpha glucosidase (95%) by decreasing the absorption of glucose in the blood, is shown in postprandial plasma glucose. Besides the bay Leaf also functions as an antioxidant (87%). Alpha-glucosidase is an enzyme that is located in the epithelium membrane in the small intestine which is important that functions to hydrolyze carbohydrates in food into monosaccharides, such as glucose and fructose. (Fierro, 2008, Lee, 2013)

The enzyme is then absorbed into the blood, increasing blood glucose levels. In the initial study with a dose of EEDS dose 18.1 mg / 200 gr BB in the treatment group 1, 36.2 mg / 200 gr BB in the treatment group 2 and 72.4 mg / 200 gr BW in the treatment group 3 for 15 days could not reduce glucose levels blood so the study was re-done with a dose of 150 mg / gr BW EEDS in treatment 1, 300 mg / gr BB EEDS in treatment 2, 450

mg / gr EEDS BW in treatment 3. From the remake of bay leaf extract with maceration method obtained 700 gr of dry powder, and extract weight of 45.12 gr dissolved in 70% ethanol. The results of this study indicate a decrease in blood sugar.

## CONCLUSION

There is a significant difference between Glucose level Pre EEDS and Post EEDS in the control and treatment groups (p value: 0.006). This shows that administration of EEDS to diabetes mellitus can reduce glucose level levels.

## SUGGESTION

Giving bay leaf extract to lower blood sugar when it needs to be considered the right time, how long it can regulate blood sugar to normal conditions.

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