The effectiveness of *Myrmeleon* sp in reducing blood sugar levels to diabetess mellitus patients in the Batui health center Banggai Regency.

Mirawati Tongko[1*], Siska Mahmud[1]
[1]Department of Public Health, Faculty of Public Health, Tompotika Luwuk University
*Email: tongkomirha@gmail.com

Abstract

Myrmeleon sp. is an insect that lives in the soil that some people believe in a certain ethnicity in the treatment of Diabetes disease. This research aims to find out the effectiveness of *Myrmeleon* sp in lowering blood sugar levels of Diabetes Mellitus patients in the working area of Puskesmas Batui Banggai Regency. This type of research is a "Quasi experiment" using the design of One group Pretest-Posttest. The study sample was patients diagnosed with Diabetes mellitus in the working area of Batui Health Center Banggai Regency, Respondents were divided into a group of experiments that were previously sampled selected with purposive sampling techniques, then the data was analyzed to find out the effectiveness of *Myrmeleon* sp, To test the hypothesis of this study used Wilcoxon Signed Rank Test with SPSS program. The results showed that there was a significant difference between GDS measurements before and after *Myrmeleon* sp consumption. It concluded that *Myrmeleon* sp is effective in lowering blood sugar levels in patients with Diabates mellitus.

Key words : *Myrmelleon*, diabetes mellitus.

Introduction

The main health problem experienced by developing countries today is the diabetess mellitus (Brown et al., 2005; Morgan & Harris, 2015). Diabete mellitus (DM) is a condition in which blood sugar levels exceed normal limits otherwise known as hyperglycemia (Verma et al., 2006), if the condition is not well controlled leads to various complications of the disease which will aggravate the condition leading to death (Deshpande et al., 2008). Diabetes mellitus is one of the top causes of death in the world (Mathers et al., 2009). The largest increases in prevalence occurred in South Asian and African (Bindraban et al., 2008) of risk factors include urbanization, age and unhealthy lifestyle (Motala, 2002), and projected rise to 366 million in 2030 (Wild et al., 2004). Indonesia is one of the top ten countries of diabetes prevalence in Asia (Ramachandran et al., 2010). The prevalence of diabetes predicated a potentially increase in Indonesia (Sutanegara et al., 2000). In Indonesia was 1.1% of the total population aged 15 years and over, increasing to 2.1% in 2013 (Kurnia et al., 2017).

The highest prevalence of diabetes mellitus in Indonesia is found in Central Sulawesi (3.7%), cases of patients at Anutapura Palu Hospital were reported in 2017 as many as 4177 sufferers (Hardayanti et al., 2018). Based on the report Health Office of Central Sulawesi in

2018, the number of DM patients reached 6,547 cases. In health clinic of Kampung Baru Luwuk Banggai District was recorded that increased of diabetes mellitus case namely 50 clients in 2014 and 85 clients in 2015 (Yulianti & Rayasari, 2016).

Generally, the treatment of diabetes mellitus is carried out using antidiabetic drugs (Hampp et al., 2014) or insulin injection (Petznick, 2011; Zeyfang et al., 2012). Traditional therapy is also rated quite effective for the treatment of diabetes and have few side effects (Seto et al., 2015). One of the natural ingredients that can be used for the treatment of DM is *Myrmeleon* sp (Maryati et al., 2019). Methanolic extract of *Myrmeleon* sp sphad the highest inhibitory activity toward α-glucosidase enzyme (Rahma et al., 2016), and can significantly lower of blood glucose levels (Rahma et al., 2016). This study aimed to examine the effectiveness of *Myrmeleon* sp to lower blood sugar in diabetes mellitus patients at Batui health center Banggai Regency.

Methods

The type of this research is quasi experiment, used one group pretest-posttest design, where the research subjects were divided into one experimental group, a pretest was given before treatment, after that a posttest was carried out to determine the results of the study. The subjects of this study were 40 patients diagnosed with diabetes mellitus in the working area of Batui health center Banggai Regency. The sample selection used a purposive sampling technique, including: (a) chronic diabetes mellitus patients, (b) having blood sugar levels (GDS) more than the normal limit> 180 mg / dl when the treatment is going to be carried out (c) the patient who is willing / agree to be given the *Myrmeleon* sp consumption (d) there is not experiencing serious complications from diabetes mellitus

The experiment was conducted twice observationally before and after treatment. Research with one group pre-test and post-test design design is conducted in three stages. The first, measuring the dependent variable, namely blood sugar levels before the *Myrmeleon* sp test (pre-test). The second, giving treatment, namely consumption of *Myrmeleon* sp, and the third, measuring differences in GDS levels after treatment (post-test). The treatment is given for 7 days by consuming *Myrmeleon* sp. The data were collected using a questionnaire and observation sheet measuring blood sugar levels through a glucometer examination where normal is within the GDS range of 100mg / dl - 180 mg / dl, mild diabetes if the GDS level is in the range 200mg / dl - 350 mg / dl, and severe diabetes if in the range of more than 350 mg / dl. The data were analyzed used Wilcoxon Signed Rank Test (Reidy & Dancey, 2007) using SSPS program.

Result and Discussion

Based on table 1 showed that the age group of respondents is at most 50% in the age range 56 - 65 years, this shows that the majority of people with diabetes are at a degenerative age before reaching the old elderly period. The data above shows that there is sufficiently strong evidence that age will increase the risk of increasing blood sugar in the body

Table. 1 Distribution of respondents by Age, Gender, Profession (N=40)

No	Characteristics	Frequency (n)	Percentage (%)
1	Age		
	<26 years	0	0
	26-35 years	0	0
	36-45 years	5	12.5
	46-55 years	13	32.5
	56-65 years	20	50
	> 65 years	2	5
2	Gender		
	Male	23	57.5
	Female	17	42.5
3	Profession		
	Housewife	11	27.5
	General employees	7	17.5
	Farmer	4	10
	Government employees	10	25
	Retired	8	20

The gender with the majority of diabetes is male as much as 57.5%, while the work group with low activity has the largest percentage, namely as housewives 27.5%. This is in line with research published in The Scottish Diabetes Research Network Epidemiology from the University of Glascow which states that men are more likely to be insulin sensitive than women, thus increasing the risk of diabetes. Dolongseda et al., (2017) concluded that there is a relationship between physical activity patterns and blood sugar levels in Type II DM patients.

Based on the measurement of blood sugar levels when using a glucometer to 40 respondents before the treatment of *Myrmeleon* sp consumption was carried out, it was found that respondents who had normalblood sugar levels were 0%, and respondents who had mild blood sugar levels were 62.5% and then 37.5% for severe blood sugar level (Table 2). The results of measuring blood sugar levels using a glucometer after the treatment of *Myrmeleon* sp consumption above showed a decrease in blood sugar levels after being given the action on the seventh day. So that the table states that there is a decrease in GDS which is on a weight scale which originally had 15 respondents (37.5%) down to 9 respondents (22.5%) and the normal category became 11 respondents (27.5%) where previously there were no respondents who had normal GDS levels. *Myrmeleon* sp spextract can be used to control blood glucose and at the same time lower hematocrit concentrations that generally accompany DM (Susanto et al., 2020). Based on the results of the research by Muadifah et al., (2017) using the LC-UV method that the extract *Myrmeleon* sp. contained metformin, one of compounds for hyperglycemia treatment type 2-diabetes. In addition, the results of research by Mujahid et al., (2013) also explain that, the combination of bitter gourd and ant lion larvae (75:25 w/w percentage) exhibited hypoglycaemic

effect by 32.20+2.57%. Metformin, an antidiabetic agent with extrapancreatic action, decreased the blood glucose level by 39.29+2.96%.

Table 2. Distribution of respondents based on Glucose levels prior to and after consuming *Myrmelleon* (N = 40)

Glucose levels	Before to consuming *Myrmeleon* sp n (%)	After consuming *Myrmeleon* sp n (%)	p Value
Normal			
100mg/dl – 180 mg/dl	0 (0%)	11 (27.5%)	0.000
Mild			
200mg/dl – 350mg/dl	25 (62.5%)	20 (50%)	
Severe			
>350mg/dl	15 (37.5%)	9 (22.5%)	

Based on the measurement of blood sugar levels when using a glucometer to 40 respondents before the treatment of *Myrmeleon* sp consumption was carried out, it was found that respondents who had mild blood sugar levels were 62.5%. Even though it is mild, a person with blood sugar levels above 180mg / dl is still diagnosed with Diabetes mellitus, which will have harmful secondary effects on the body including complications that lead to a more severe condition. Meanwhile, the percentage of respondents who had a heavy blood sugar level of 37.5% would certainly be a destructive threat to the respondent's condition. The state of high sugar levels above normal continuously (chronically) must be addressed immediately to get back to normal controlled blood sugar conditions. The results of measuring blood sugar levels using a glucometer after the treatment of *Myrmeleon* sp consumption above showed a decrease in blood sugar levels after being given the action on the seventh day. This means that there is a significant difference between GDS measurements before and after the consumption of *Myrmeleon* sp.

Conclusion

The majority of people with diabetes are at a degenerative age before reaching the old elderly period. The gender with the majority of diabetes is male as much as 57.5%, while the work group with low activity has the largest percentage, namely as housewives 27.5%. The treatment of Myrmellleon consumption showed that there is a decrease in GDS which is on a weight scale which originally had 15 respondents (37.5%) down to 9 respondents (22.5%) and the normal category became 11 respondents (27.5%) where previously there were no respondents who had normal GDS levels. So that it can be concluded that *Myrmeleon* sp is effective in reducing blood sugar levels in people with diabetes mellitus.

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