Antlion (*Myrmeleon sp.*) Infusion as Antidiabetic in Dexamethasone Induced Mice

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Abstract. Diabetes Mellitus (DM) is a degenerative disease which classified as number 6 death caused worldwide mark by hyperglycemia condition. Antlion (*Myrmeleon sp.*) used as antidiabetic traditionally in Tasikmalaya. This research aims to evaluate antlion (*Myrmeleon sp.*) infusion antidiabetic activity. Dexamethasone was used to induce hyperglycemia condition in all treatment group. Negative group were given CMC 0.5%, positive group were given metformin 1.3 mg/20 g bw, dose 1, dose 2 and dose 3 were given antlion infusion 0.104 mg/20 g bw, 0.208 mg/20 g bw and 0.416 mg/20 g bw respectively. The effect of antlion infusion was observed at 0, 30, 60, 90 and 120 minutes. Antlion infusion has an antidiabetic activity which dose 2 showed the best effect in decreasing blood glucose. The best blood glucose decrease (BGC) come out from dose 2 with % BGC at 60, 90 and 120 minutes 28.19%, 28.39 %, and 31.20 % respectively.

1. Introduction
Diabetes Mellitus (DM) is a noninfectious disease which has become a global health problem and increasing every year. DM is a clinical syndrome mark by hyperglycemia condition where blood glucose remains high. DM should be treated with non-pharmacology or pharmacology treatment. Antlions (*Myrmeleon sp.*) used empirically to treat DM.

The community believes that antlion larva can decrease blood glucose level in DM patients. Antlions juice dose 0.01 mL/200 g bw rat (14 days) fix hyperglycemia condition [1]. Antlion extract or powder give the same result in decreasing blood glucose level in hyperglycemia condition [2]. Dexamethasone (corticosteroid) has a side effect in increasing blood glucose level [3] and can be used as hyperglycemia induction.

As mention earlier, antlion (*Myrmeleon sp.*) antidiabetic effect has to be evaluated using dexamethasone as hyperglycemia induction.

2. Experimental Details
It was an experimental research using female mice. Mice were divided into 5 groups induced by dexamethasone intraperitoneally until it reached hyperglycemia condition. Blood glucose was monitor using GlucoDr at 0, 30, 90 and 120 minutes. Data were analyzed using ANOVA and LSD.

2.1 Tools
Glass tools, gavage oral, glucometer, glucose strip, restrainer, stopwatch, and spuit 1 mL.
2.2 Ingredients
Antlions (Myrmeleon sp.), aquadest, female mice, CMC-Na 0.5 %, aqua pro injection, metformin, dexamethason, alcohol.

2.3 Animals
Female mice 2-3 months (20-30 gram body weight) were adapted for 7 days.

2.4 Research Procedure
2.4.1 Animal Determination
Determination of antlion (Myrmeleon sp.) was done at Laboratorium Entomologi Fakultas Biologi Universitas Gadjah Mada.

2.4.2 Antlion Infusion Dosage
Empirical dosage from 3 antlions larva equal to ±80 mg human dose. The dose was converted to mice:
- Dose 1: 0.104 mg/20 g bw
- Dose 2: 0.208 mg/20 g bw
- Dose 3: 0.416 mg/20 g bw

2.4.3 Dexamethasone induction Dosage
Dexamethasone was injected intraperitoneally 20 mg/Kg bw mice using dexamethasone ampoule 5 mg/mL.

2.4.5 Antlion Infusion Preparation
Antlion (Myrmeleon sp.) were obtained from Talagasari, Kawali-Ciamis. Antlion was boiled in 90°C water for 15 minutes.

2.4.6 Antidiabetic Activity Test
Female mice were adapted for 7 days and were given normal feed.
Group 1: Negative group induced by dexamethasone and given CMC 0.5 % (p.o.).
Group 2: Positive group induced by dexamethasone and given metformin.
Group 3: Dose 1 induced by dexamethasone and given antlion infusion 0.104 mg/20 g bw.
Group 4: Dose 2 induced by dexamethasone and given antlion infusion 0.208 mg/20 g bw.
Group 5: Dose 3 induced by dexamethasone and given antlion infusion 0.416 mg/20 g bw.

2.5 Data Analysis
Blood glucose level from all groups was the monitor at 0, 30, 60, 90, and 120 minutes. Analyzed using SPSS version 22.
% Blood Glucose Decreaseement (BGD) were calculated:

\[ \frac{(\text{Negative Group} - \text{Treatment Group}) \times 100}{\text{Negative Group}} \]

3. Results and Discussion
3.1. Sample preparation
Larva from the ground was washed. Antlion infusion made based on empirical dosage, 3 antlions equal to 80 mg for human dosage and was converted to mice dosage. Mice dosage were divided into dose 1 (0.104 mg/20 g bw), dose 2 (0.208 mg/20 g bw) and dose 3 (0.416 mg/20 g bw). Antlion infusion was made by boiling simplicia/larva in 90°C water for 15 minutes [4].

3.2. Dexamethasone Induction Method
Dexamethasone is a corticosteroid used as antiinflammation and its side effect is increased blood glucose level. Dexamethasone increases the gluconeogenesis process in the liver and decrease glucose uptake into peripheral tissue causes hyperglycemia [3]. Intraperitoneal dexamethasone 20 g/Kg mice bw successfully increased blood glucose level>110 mg/dL [5].

3.3. Antidiabetic Activity Test

Blood glucose level was monitor 5 times at 0, 30, 60, 90 and 120 minutes after given antlions infusion. Table 1 showed from 0, 30, 60, 90, 120 minutes, every group gave the best decrement of blood glucose at 120 minutes. After 120 minutes, the drug has optimally absorbed by the body so it can give the best result in blood glucose level. Dose 1, dose 2 and dose 3 showed decreasing in blood glucose higher than positive group (metformin). Dose 1, dose 2 and dose 3 did not differ significantly in % BGD, with dose 2 as the best dosage.

| Table 1, Blood Glucose Level |
|-----------------------------|
| Blood Glucose Level (mg/dL) |

| Group | Post test | Dose | 0 minute | 30 minute | 60 minute | 90 minute | 120 minute |
|-------|-----------|------|----------|-----------|-----------|-----------|------------|
|       |           |      |          |           |           |           |            |
|       |           |      | 8 hours  |           |           |           |            |
| Negative | 106±9.80 | 120±2.1 | 153±16.85 | 140±8.9 | 131±25.4 | 130±7.8 | 133±8.25 |
| Positive | 97±11.75 | 125±8.81 | 120±2.54 | 115±24.2 | 110±5.4 | 110±5.3 | 114±7.35 |
| Dose 1 | 106±4.08 | 110±2.5 | 103±5.5 | 103±25.1 | 102±3.1 | 102±3.5 | 94±7.5 |
| Dose 2 | 102,75±10,53 | 112±8,08 | 103±2.5 | 94±17 | 91±7.5 | 91±5.9 | 91±9.14 |
| Dose 3 | 106±4.08 | 7 | 99 | 91 | 37 | 40 | 100,5±10,24 |

Blood Glucose Level (mg/dL)

**Picture 1. Blood Glucose Decrease**
3.4. Data Analysis
Data analysis using SPSS version 22, ANOVA normality and homogeneity test, and LSD test. Normality test was done from 0, 30, 60, 120 minutes showed p>0.05 as data normally distributed. Homogeneity test from 0, 30, 60, 90 and 120 minutes showed p>0.05 as data were homogenous. ANOVA showed there was significant differentiation in every group from 0, 30, 60, 90 and 120 minutes. LSD (Least Significant Differences) test showed that negative group differs compared to the positive group, dose 1, dose 2 and dose 3. Dose 1, dose 2 and dose 3 did not differ compared to the positive group.

4. Conclusion
Dose 2 (0.208 mg/20 g bw) has the best antidiabetic effect in hyperglycemia mice induced by dexamethasone.

5. References
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