

# A CHARACTERIZATION OF PROPORTION OF ORGANIC MATTER LEVEL OF TENEBRIO MOLITOR LARVA REARED IN TWO DIFFERENT MEDIA CONDITIONS

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## Abstract

The aim of this research was to observed the proportion of organic matter (MO) levels of *T. molitor* serum reared in two different conditions: lightening restriction (M1) and natural lightening (M2) detected in 10<sup>th</sup> and 20<sup>th</sup> days old of larva, beside to evaluate the its body weight. The MO was realized by using a field method of semi-quantitative technique with a portable-refractometer. Secondly was to evaluate the body weight of larva at 20<sup>th</sup> day old. The insects were reared in two lighting condition namely light and dark. The quantification was made in 10<sup>th</sup> and 20<sup>th</sup> day old. The results showed that there has no interaction ( $P>0.05$ ) of treatment on proportion of organic compound level of *T. molitor* experimental but the treatment gave a significant effect ( $P<0.05$ ) on body weight at 20<sup>th</sup> day old.

**Key words:** Insect, *Tenebrio molitor*, media, lihtening, organic matter

## INTRODUCTION

The production of *T. molitor* insects could be developed and directed as animal feed ingredient, and therefore a good rearing management is needed to be improve. This insect contained nutrient important for livestock (Rumokoy et al., 2021; Stull et al., 2019).

One of the most influential factors in rearing is the environment, including lighting. Sunlight exposure correlated with temperature, but for insects as poikilothermic animals it has a physiological role in adjusting body temperature according to environmental temperature.

Based on the conditions as stated above, we have conducted a study that aims to characterize the proportion of organic matter levels of *T. molitor* reared in two different media conditions.

## MATERIAL AND METHOD

New born larva of *T. molitor* were placed in two cylyndric glass containers having a diameter of 13 cm and a high of 17 cm, and

then two boxes were used to keep each container. These boxes were made with a dimension of (60\*35\*15) cm. The first box was conditioned under a lightening restriction by using a porous nylon sack wrapped araound the wall of box. The rearing media placed in this dark box called M1, while the second one was conditioned without a restriction lightening the rearing media in this light box was M2. All larva were fed with a same feed: wheat flour, carrot and banana.

The data of serum organic matter level were observed at 10<sup>th</sup> day old (H10) and at 20<sup>th</sup> day old of larva as H20. Randomize Complete Design arranged with two factors (time of observation and lightening conditions). The serum was isolated after dissection and septation the interior mass of body, brewing and filtering the substances adapted to the procedure of Toar et al. (2019). Ten replications of each treatment were done, five individuals per replication were used. Body weight was measured at 20<sup>th</sup> day old. The data of organic matter level were statistically analysed by using two ways anova, to detect the influence of treatment on serum organic level proportion using a portable refractometer, expressed in %Brix

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value. The body weight larva in two different lightening conditions were statistically analysed using t-test according procedur of Zar (2010).

**RESULTS AND DISCUSSIONS**

The proportion of organic matter (OM) level contained in body serum of *T. mollitor* as shown in Fig. 1 was stated with %Brix value. The data of MO proportion level of *Tenebrio molitor* which was treated with dark media (M1) and light media (M2) in 10<sup>th</sup> day and 20<sup>th</sup> day of life tended a high in M2H20 and M1H20 compared with the others treatment. We did not get an interaction

between treatment on MO proportion level ( $P>0.05$ ). These data indicate that up to this stage the organic matter content has not experienced a significant difference. This can be caused by the composition of organic matter content, including proteins, fats, carbohydrates that have not undergone significant changes during the observation period but this still needs to be confirmed through further searches. The body temperatur of insect as a poikolothermic animal (van der Meer, 2021; van Broekhoven et al., 2015) and it is not influenced by the environment sun light (Hapsari et al., 2018)

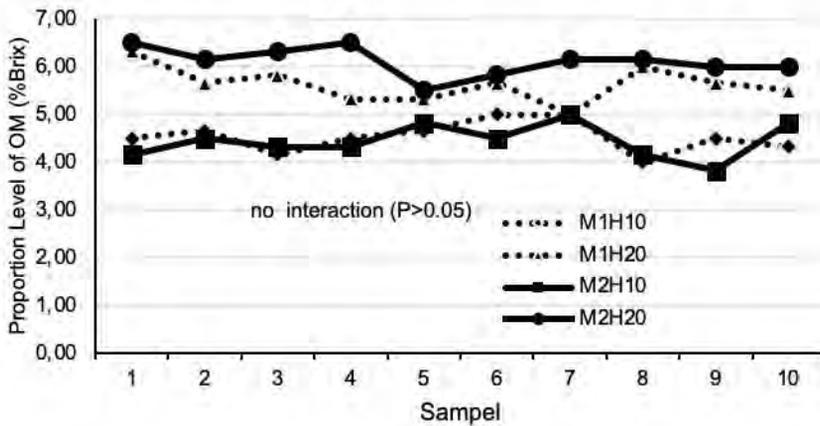


Fig. 1 Organis Matter Level of Serum of *T. mollitor* Larva

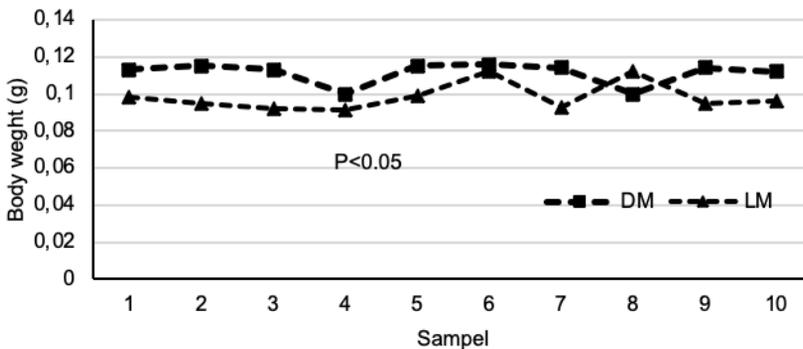


Fig. 2 Body weight of *T. mollitor* Larva

The Fig. 2 described the body weight of *T. molitor* larva obtained at 20<sup>th</sup> day old which were reared in dark media (M1) and light media (M2). According to this graph, the body weight of larva reared in M1 were significantly higher than those in M2 ( $P < 0.05$ ). This performance tends to be due to the higher activity of *T. molitor* larvae in less luminous media than in media that openly have brighter light. This tendency means that in slightly darker conditions the larvae have the opportunity to use the available food to convert it into body mass as related to the scientific report of Stull et al. (2019).

## CONCLUSIONS

The lightening and life time up to 20<sup>th</sup> day old was not influence to the proportion of organic matter of *Tenebrio molitor* larva This results could be a direction to allow the use of this various life stage insect production for feed ingredients. While the body mass chagement could be connected to the calculation for animal feed requirement.

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