

EFFECTS OF ESSENTIAL OILS AND THEIR COMPOUNDS ON MEALWORMS (*TENEBRIO MOLITOR L.*) LARVAE

Gabrielė Bumbulytė^{1,2}, Vincas Būda²

¹Vilnius University Faculty of Natural Sciences, Vilnius

²The Nature Research Centre, Laboratory of Chemical and Behavioural Ecology, Vilnius
gabriele.bumbulyte@gmail.com

Entomophagy is not a new phenomenon in our society. Insects have been eaten by humans from prehistoric times. Nowadays people eat insects not only as an exotic snack, but in some societies insects are the main food source. According to the Food and Agriculture Organization of the United Nations [1], population growth, urbanization and the increase of human population of average income has increased global demand for food products, in particular those with great source of protein. One of the main aspects why insect eating is an alternative to the animal meat is because insects are very nutritious, they multiply fast and do not contaminate the environment. Currently the ecological insect farms are very popular and attempt to include insects in the daily diet of humans.

Mealworms (*Tenebrio molitor L.*) are easily cultivated, have a relatively large increase in biomass, are nutritious and a great source of protein. Because of these characteristics mealworms are the best example of insect food for humans. It is very important to increase the effectiveness of the collection of insect larvae biomass for the insect breeders. One of the possibilities could be the manipulation of insect larvae behavior using natural repellents. Natural repellents could divert larvae from their food source to the collection points since this is related to the food industry, most of materials should be non-toxic to humans. Essential oils as natural repellents could be perfectly used for controlling insect behavior. The current thesis describes the impact of natural essential oils on the behavior of mealworm larvae. The results showed that the best repellents for the mealworm larvae were the essential oils of thyme (*Thymus vulgaris L.*) and mint (*Mentha spicata L.*). The effect of active compounds of essential oils was also tested. The best repellency was recorded for 100 mM concentration of citronellol and 100 mM of linalool. It has been observed that in control plates without stimulus, the larvae spend most of their time on the periphery, not in the central zone. The effect of 3-methylbutanol, a product of mold metabolism, has been studied on the largest larvae of mealworms. However, this substance has not shown affect to larvae locomotors.

[1] FAO. Edible Insects. Future Prospects for Food and Feed Security; 2013