

Yamamarin is a peptide isolated from the hemolymph of *Antheraea yamamai* caterpillars. What is its function? Preliminary studies have shown that yamamarin possess antiviral activity. Further research, which were focused on defining the physiological role of the peptide in insects, so far demonstrated the inhibitory effect on myocardial activity in the beetles *Tenebrio molitor* and an inhibiting effect on the process of cellular respiration and the cell cycle. Additionally yamamarin cause initiation of diapause in the moth *Bombyx mori*. It also showed inhibitory effect of yamamarin on rat tumor cells, *A.yamamai* ovary cell line and the *Drosophila melanogaster* S2 cell line growth, what confirms its anti-proliferative activity. However, its physiological function is still not fully understood. The precise role of this peptide could be used to develop a peptidomimetic, chemically modified peptides, that could serve as an alternative for synthetic insecticides. Given the anti-proliferative activity of the peptide, it seems reasonable to select for tests the reproductive system, as a place of intense cell division. Therefore, the objective of the project is to determine the yamamarin effect on reproductive system physiology, embryogenesis and early-larval development in mealworm beetle (*T. molitor*). To characterize the impact of yamamarin on the development of the reproductive system, estimation of ovarian morphology, the F-actin cytoskeleton in follicular cells - responsible for the appropriate redistribution of nutrients necessary for proper development of the eggs will be conducted. To determine the effect of the peptide on the functioning of the reproductive tissues the ability of the peptide to initiate atresia and oosorption in the follicles cells will be conducted. To assess changes in the vitellogenins content - precursors of nutrients in the tissues, Western Blot technique will be used. To determine changes in the quantity and quality of laid eggs SEM microscopy will be used. Microscopy techniques will be used also to assess the impact of yamamarin on duration of embryogenesis and early-larval development.

The obtained data will indicate the range and specificity of yamamarin action on tissue associated with reproduction and will determine its impact on embryogenesis and early-larval development in beetle, which will greatly expand the knowledge about the peptide physiological role in insects. Data obtained during the project, may in the future be used to develop alternatives to synthetic insecticides - peptidomimetics, compounds used to control insect pests. It is particularly important due to problem of providing enough food amount for an increasing human population, which is related to, among others, the destruction of agricultural crops, orchards and forests by insects.