

Data acquired during the realization of the project will determine the pleiotropic mechanism of action of three allatostatins – Trica-AST C (pESRYRQCYFNPISCF-OH) from PISCF/AST family, Grybi-AST B1 (GWQDLNNGGwa) and Trica-AST B5 (SKWDNFRGSWa) representing MIP/AST family, in beetle *Tenebrio molitor* L. in respect to already known mode of action of these compounds in other insects. At the moment, there are three known types of allatostatins: type A, that was isolated for the first time from the cockroach *Diploptera punctata*, B discovered in the cricket *Gryllus bimaculatus* and C isolated from Lepidoptera. However Coast and Schooley (2011) are suggesting to rename all types due to their biological properties and amino acid sequence. They suggest that the type B belong to a family of mioinhibitory peptides (MIP/AST), and two other types should be called FGL/AST (type A) and PISCF/AST (type C). Studies show that allatostatins from all three groups inhibit the synthesis of juvenile hormone (JH) by neurocerebral complex - corpora allata (CA). JH is responsible for regulation of the development, metamorphosis and gonadotropic cycle. In research taken so far it was determined that some of these peptides show pleiotropic activity. It was shown that allatostatins from PISCF/AST family exhibit cardio inhibitory properties on heart of *Drosophila melanogaster*, are responsible for regulation of gut contractility of moths *Lacanobia olearacea* and *Manduca sexta* by decreasing the frequency of contractions of this organ and also they decrease survival rate of feeding larvae in *L. olearacea*. Similarly it was observed that allatostatins from MIP/AST inhibit endogenous contractile activity of gut of cockroaches and bugs and oviduct of *Locusta migratoria*. Taking into consideration the mode of action of allatostatins in mentioned insects, it can be assumed that these peptides will show similar biological activity in beetles. However our preliminary studies show that Grybi-AST B1 affect differently the contractile activity of oviduct and hindgut of *T. molitor* in comparison to mechanism known in cockroaches. The Grybi-AST B1 also show slight mioinhibitory effect on the heart of *T. molitor* which may indicate that mode of action of this peptide is species-specific. As well, available data do not explain how and if allatostatins affect the function of insect immune system and haemolymph cells. Initial studies on haemocytotropic activity show that Grybi-AST B1 significantly change morphology of beetle's haemocytes as well as the structure of F-actin cytoskeleton and it impairs the immune system of insect. Project involves a comprehensive studies of effect of allatostatins on physiological functions of beetle, *Tenebrio molitor*. This insect belong to economically important group of animals for which little information is available on the action of the allatostatins and their physiological role. These studies can serve for better understanding of processes regulated by allatostatins in beetles and taking into consideration that insects are the biggest group of pests of forests and agriculture, more precise knowledge on the role of allatostatins may help in the future in search for new compounds in form of peptidomimetic, which can be used as potential bioinsecticides.