Gypsy moth (*Lymantria dispar*) natural midgut microflora and its potential role in populations regulation

Zane Metla*, Jūlija Haļimona, Rita Sešķēna, Līga Jankevica*
Laboratory of Experimental entomology, Institute of Biology, University of Latvia,
Addres: Salaspils, Latvia, LV-2169
e-mail: zmetla@inbox.lv

Digestive tract of insects contains complex biota that impacts host insect's physiology – development, growth, pathogenesis and environmental adaptation. Entomopathogenic organisms – bacteria, viruses, fungi, protozoa, and nematodes are used for microbial control and they show considerable control of target populations (Lacey et al. 2001). Many entomopathogens are specific to certain species or groups of insect pests and have the potential to provide long-term control. There are also some disadvantages, linked with their persistence, speed of kill, specificity.

Natural gut microflora of insects reflects the state of health of their host. Beneficial contribution of gut microbiota to host health is generally acknowledged. Studies suggest that microorganisms provide essential nutrients or assist in important biochemical functions (Broderick et al. 2004). Symbiotic relationships between insects and guts microflora have been studied extensively in last few years by investigation of larval gut enteric bacteria role on susceptibility of *B. thuringiensis* and it's interactions with it and the possibility to use mixed infections in larval control. There is the evidence that establishment and maintenance of microbial assemblage within the larval midgut may contribute to insect health perhaps by suppression of pathogens (Broderick et al. 2009).

There have been the attempts to change traditional formulations of biopesticide by various alternative means of delivery, including endophytic bacteria such as *Clavibacter xyli* or *Bacillus cereus* or plant-colonizing bacteria, including *Pseudomonas fluorescens*, *Burkholderia cepacia*, *Rhizobium leguminosarum* and *Azosporillium* spp. (Lacey et al. 2001).

Aim of our investigation was to evaluate changes in natural midgut microflora of gypsy moth during past few years and to compare its structure changes per individual and all population in general with impact on potential midgut microflora synergist, which might be used in development of biological control strategies based on symbiotic interactions.

The results showed relatively simple composition of gypsy moth midgut community, but there were significant differences between larval individuals. Microbial composition depends on different biotic and abiotic factors whose changes can cause development of pathogenic microorganisms and also affect its stability.

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References:

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