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COMBINING BIOMASS ENERGY OF ENTOMOPATHOGENIC NEMATODES AND BACTERIAL PREPARATIONS AGAINST PEST INSECTS

Introduction

Entomopathogenic nematodes (EPN) (*Steinernema* and *Heterorhabditis* spp.) are well suited for pest control of harmful insects because they attack a broad range of pests and can be easily applied with conventional spray equipment [1,2]. Insect-pathogenic nematodes occur naturally in almost all soil and reproduce only in insect hosts, which they have killed. More than 30 species have been discovered worldwide. Due to the ease of nematode mass-production, several nematode-based products have been developed for use in the microbial control of agricultural and forest pests. Nematode species and strains differ in their activity against different insect pests. These differences are partially due to differences in the searching behaviors of nematodes, and partially to the type and number of symbiotic bacteria carried by the infective juveniles [3].

The intensive use of chemical insecticides has promoted rapid evolution of resistance, why alternative control measures are developed. Bacterial preparation *Gomeline*, *Dendrobacilline*, *Lepidocide*, *Thuringiensis-2*, *Bitoxibaçilline* (Btb) and etc. and EPNs have shown potential to control for various harmful insects.

But the efficacy of bacterial preparations can be reduced [4] due to intensive spraying and subsequent resistance development. For resistance management other biocontrol agents are necessary. We therefore focused on the combined biological management for *Operoptera brumata* and *Erranis defoliaria*, in order to avoid resistance development and enhance the efficacy of the biological agents.

For the experiment we used III-IV instar worms of *Operoptera brumata* and *Erranis defoliaria*. Both species of pest insects, which are polyphagous. They can damage more than hundred plants [5] and they are particular pests for those trees, which started vegetation early [6].

Material and Methods

We collected pest insects for laboratory experiments in different regions of East Georgia, from privat plots of orchard (an apple, pear, plum and nut) and from foliaceous trees (oak, hornbeam, maple etc.).

The collection of materials was made with packets and traps. The materials were placed in special cotton sacks, in jars and sorted them by species.