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# Bees as entomovectors and the biological control agent *Gliocladium catenulatum* J1446

Riin Muljar, Marika Mänd

Estonian University of Life Sciences, Institute of Agricultural and Environmental Sciences,  
1 Kreutzwaldi St., 51014 Tartu, Estonia; riin.muljar@emu.ee

There is a need for more environmentally friendly plant protection methods, since the increasing use of agrochemicals has led to pesticide residues and resistance problems in the control of *Botrytis cinerea*. An alternative to chemical spraying is to use bees as entomovectors to disperse biological control agents. Prestop Mix is a biofungicide that contains spores of the parasitic fungus *Gliocladium catenulatum* J1446, which has been successfully used in the control of *B. cinerea*. In 2010 we conducted a field experiment to study the efficiency of using bees in dispersing *G. catenulatum* in Estonian conditions. The study was carried out in two strawberry plantations of Tartu County, strawberry varieties were `Sonata` and `Polka`. Honey bee hives were placed at the edge of strawberry fields; to each hive we attached a dispenser containing the Prestop Mix preparation. Exiting the hive honey bees walked through the preparation powder and carried it onto the strawberry flowers. We compared the bee-disseminated biocontrol with untreated control, the control plots were covered with exclusion cages. The proportion of healthy and botrytis infected berries were evaluated. Our results show that treating strawberry plants with the bee-dispersed *G. catenulatum* significantly reduced the proportion of infected berries compared with the control; efficiency of the treatment also depended somewhat of the strawberry variety.

Since there is little data on the safety of *G. catenulatum* to the physiology of bees, we conducted contact and feeding tests with commercially produced bumble bees in the laboratory, to study the effect of the preparation to the metabolic rate of bees, measured by recording the amount of CO<sub>2</sub> release (VCO<sub>2</sub> ml h<sup>-1</sup>). Results show that dusting bumble bees with Prestop Mix powder lowered the metabolic rate of treated bees, whereas feeding bees with the biopreparation had no effect on the metabolic rate of treated bumble bees.