EPN and the ERBIC* project

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* **E**nvironmental **R**isks of **BI**ological **C**ontrol introductions into Europe, EU-FAIR5-CT97-3489

In ERBIC, EPN were involved in one of the case studies (focussing on massive inundation of insect pathogens) in order to gain insights into developing a general evaluation scheme for the environmental safety of biological control agents.

Main aim was to develop general evaluation methods applicable to all sorts of biocontrol agents

Abundant data on EPN NT-safety already available; only little new work was conducted in ERBIC, often in the course of work with EP-fungi:

- **natural occurrence and epizootics**
- **direct impact on adults of carabids + *Aleochara bilineata***
- **field test in oilseed rape ecosystem on target + NT effects**
- ***S. feltiae* as a case in pilot application of risk evaluation scheme**

Naturally occurring EPN & EPF in selected non-target groups in OSR fields in Finland, during two study years

Individuals were collected from the field (traps, hand collection) and were incubated in moist chambers for two weeks. Number of tested species and individuals:

	Species	Individuals
Carabidae	32	3910
Staphylinidae (ad.)	7	148
(l.)	1	73
Coccinellidae	2	504
Collembola	2	374
Araneae	3	35
TOTAL	47	5044

Not a single infection with EPN was found: natural epizootics rare in agricultural ecosystems in Finland?

Susceptibility of Carabids to EPN in the lab

Adults of 4 dominant species of carabids were tested (maximum challenge):

Amara eurynota	(30 individuals in treatments, 30 as controls)
Harpalus rufipes	(34 trt, 20 ctr)
Pterostichus niger	(25; 15)
P. melanarius	(15; 11)

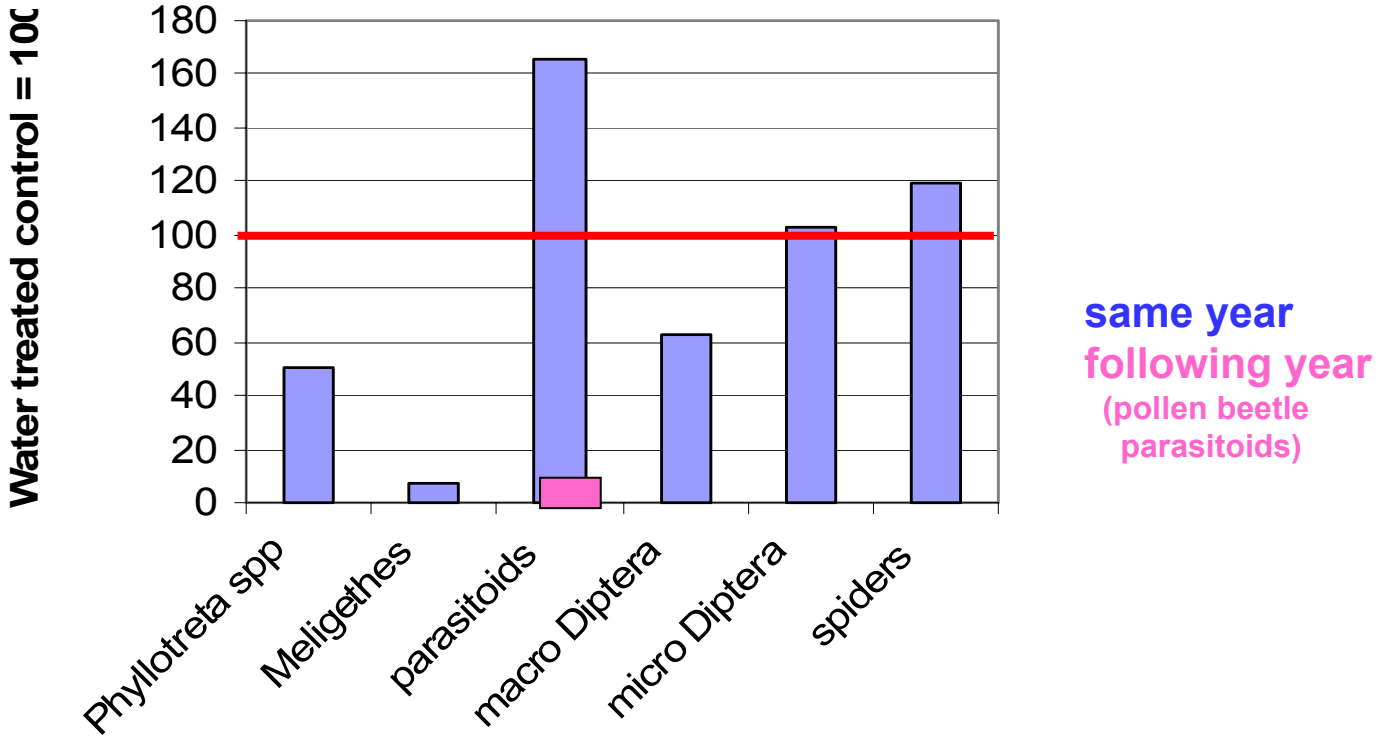
5 ml of commercially available *Steinernema feltiae* suspernsion was applied to 20 g of sterilised sand in a 9 cm Petri dish giving a concentration of 5000 - 10000 IJ/per dish.

Carabids were held in dark at 25°C - 28°C for a week; mortality was checked twice every day.

No infected (susceptible) individuals were found in any of these carabids. Same result from an extensive study with *Aleochara bilineata* (1500 indiv.)

Larvae of many carabids and *A. bilineata* known to be susceptible: **our results show that naturally occurring biocontrol by adult generalist predators is not disrupted; possible efects on larvae are localised and temporary and are not expected to result in any effects at the population level (i.e., level of naturally occurring biocontrol in the future).**

Effect of *Steinernema feltiae* - treatment on OSR target and non-target arthropods



Treatment of 1-sqm plots with 1 million *S. feltiae* applied with watering can at *M. aeneus* pupation time. Photoeclectors erected 2 weeks later (end of July) and emptied once per week for 6 weeks. Control plots treated with clean water. Eight replicates of both treatments.

Case: risk index for *Steinernema feltiae* in field crops in Finland

	Likelihood	Magnitude	L x M
Establishment	3	5	15
Dispersal	1	1	1
Host range	5	5	25
Direct effects	4	2	8
Indirect effects	4	1	4
		SUM = risk index	**53**

How to improve a system like this?
Introduce weighting factors?
Or some kind of a minimum factor –rule?

Progress in Biological Control

PIBC

Environmental Impacts of Microbial Insecticides

Need and Methods for Risk Assessment

Edited by
Heikki M.T. Hokkanen and Ann E. Hajek

Biological pesticides are increasingly finding their place in IPM programs, and the number of products finding their way to the marketplace is growing. While in many parts of the world implementation is proceeding on a large scale, in the USA and Europe registration procedures have been established to provide a low level of risk, but at the cost of retarding the implementation of microbial agents. This book will respond to the growing need to assess non-target impacts of biological pest control methods. So far, no review - let alone a handbook - exists on how to carry out the required assessments in practice, and what a particular outcome from an assessment might imply in terms of environmental risk or registration requirements. This book is intended to fill that gap. It should be of interest to many professional groups, including the scientific community involved in integrated pest management, crop protection, biological pest control, and ecology; regulatory authorities in countries around the world; ministries of agriculture; commercial companies developing biopesticides and firms carrying out environmental impact assessments; and universities with curricula in biological pest control and environmental sciences.

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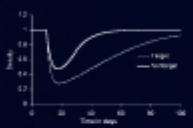

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