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1 Entomopathogenic nematodes as natural enemies for control of
2 *Rhizoglyphus robini* (Acari: Acaridae)?

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14 Abstract

15 Bulb mites of the genus *Rhizoglyphus* are cosmopolitan pests of onion, garlic and ornamental plants.
16 Despite the growing awareness against the use of pesticides, growers continue to use insecticides as
17 the main control method. Thus, the search for environmentally safe alternative control methods, such
18 as effective biocontrol agents, is of paramount importance. In the present study, the bulb mites were
19 exposed to the infected juveniles of 20 strains of *Steinernema* and *Heterorhabditis* species applied at
20 a single dose of 300 IJs per mite, and the invasion rate and mite mortality were assessed. Furthermore,
21 the effect of the culture supernatants of the selected symbiotic bacteria of the genus *Xenorhabdus* on
22 bulb mite mortality was tested. Our data show that both *Steinernema* and *Heterorhabditis* nematodes
23 are able to invade and kill bulb mites, but in general, the invasion and resulting mortality were
24 relatively low. The highest invasion rate of ca 30 IJs per mite was observed in *Heterorhabditis*
25 *taysearae*. The mortality reached the maximum of 30% in the most efficient species, namely
26 *Steinernema huense*, *H. bacteriophora* and *H. amazonensis*. The effect of the culture supernatants was
27 generally low, though there were considerable differences in the efficacy among *Xenorhabdus* species
28 and strains. To conclude we demonstrate that some EPN species are able to invade and kill bulb mites
29 but their effect is in general quite low. Based on present data, EPNs and the metabolites of their
30 symbiotic bacteria do not seem to represent a viable option for bulb mite biocontrol as a standalone
31 approach.

32 Key words:

33 *Steinernema*; *Heterorhabditis*; *Xenorhabdus*; *Photorhabdus*; bulb mite; bacterial metabolites; onion;
34 garlic; biological control

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