

Evaluation of Diffusates and Juice of *Asparagus* Roots for Their Nematocidal Effects on *Heterodera schachtii*

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Rohde and Jenkins (2)² isolated a compound from root diffusate and expressed root juice of *Asparagus officinalis* var. *altilis* L. toxic to several nematode species. Juice expressed from fibrous roots of asparagus killed 100% of *Trichodorus christiei* Allen 1957 after 18 hours, and solutions of the toxic material, drenched into the soil or sprayed directly on leaves of growing tomatoes, decreased *T. christiei* populations. Chemical tests led the authors to conclude that the toxic compound was a glycoside with the aglycone component of low molecular weight.

This paper reports tests to determine whether root diffusate or root juice of asparagus is toxic also to the sugar beet nematode (*Heterodera schachtii* Schmidt 1871).

Materials and Methods

Root diffusates of *Asparagus officinalis*, Golden State lettuce (*Lactuca sativa* L.), and sugar beet (*Beta vulgaris* L.) var. US 75 were tested to determine their effect on hatching of beet nematode larvae. Diffusates of the latter two plants were controls. Methods used in this test to obtain diffusates and cyst material and the procedures of the hatching test are described by Golden (1). The test was continued for six weeks. Treatments were replicated 4 times in individual watch glasses containing 40 nematode cysts each. The nematodes emerging from cysts were counted and the data were analysed for statistical significance.

A second test was initiated, to determine the effects of various treatments on populations of *H. schachtii* in soil. The roots of asparagus plants were thoroughly fragmented in a blender, the resulting material filtered, and the filtrate saved for use in the tests. Six-inch clay pots filled with soil containing an average of 25 cysts of *Heterodera schachtii* per gram received either 200 ml of asparagus juice, or 200 ml of tap water, or single seedling transplants of asparagus or lettuce. Pots to which asparagus juice or tap water was added were left fallow in the initial phase of the experiment. All treatments were replicated seven times, making 28 pots in all.

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² Numbers in parentheses refer to literature cited.

The asparagus and lettuce plants were allowed to grow four months, after which, they were removed from pots and discarded. At this time one sugar beet seedling was transplanted to each of the 28 pots. Fifty days later the plants were removed and examined for mature female nematodes.

Results and Discussion

In the first experiment, the average numbers of larvae emerged in the various treatments were, lettuce root diffusate 3,100, tap water 3,260, asparagus root diffusate 2,750, and sugar-beet root diffusate 10,870. Since the least significant difference at the 5% level was 1,070, it was concluded that neither lettuce nor asparagus root diffusate had any effect on hatching, while sugar-beet root diffusate had the usual stimulatory effect.

In the second experiment, the number of adult female nematodes observed on the roots of sugar beets grown 50 days in infested soil were not significantly different. It was concluded that treatments with asparagus root juice had no measurable effects on *H. schachtii*.

Summary

Soil drench treatments of asparagus juice or asparagus grown 4 months in infested soil did not decrease populations of *Heterodera schachtii*. Asparagus-root diffusate did not stimulate emergence of larvae from cysts of the beet nematode.

Literature Cited

- (1) GOLDEN, A. M. 1958. Influence of leaf diffusate of sugar beet on emergence of larvae from cysts of the sugar-beet nematode (*Heterodera schachtii*). U. S. Dept. of Agr. Plant Dis. Repr. 42: 188-193.
 - (2) ROHDE, R. A. and W. R. JENKINS. 1958. Basis for resistance of *Asparagus officinalis* var. *atilis* L. to the stubby-root nematode *Trichodorus christiei* Allen 1957. Univ. Md. Agr. Expt. Sta. Bull. A-97.
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