

TOXICITY OF SOME PESTICIDES AGAINST *PARATYLENCHUS PRUNII* (PIN NEMATODE) ON PEACH

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Carbaryl and aldicarb sulfone were highly effective chemicals against *P. prunii* and gave complete mortality at the lowest doses of 10 ppm and within limited duration of 48 hours in water and at 20 ppm within 2 days in soil. Comparable effectiveness in case of methyl parathion was obtained at higher dose of 100 ppm after 72 hours of exposure. Aldicarb and phorate granules were also equally effective to *P. prunii* in soil.

Keywords : Pathogenicity; Pesticide; Mortality.

Introduction

From the survey studies of Peach orchard in the state of Himachal Pradesh, the incidence of *Paratylenchus prunii* (Sharma *et al.*, 1986) was found in all the orchards. From the population build-up (32000 individuals per 200 g soil) and its occurrence (recorded from 67 per cent soil samples), the incidence of *P. prunii* was considered most dominant compared to other plant parasitic nematodes associated with peach (Sharma and Sharma, 1987a). Originally *Paratylenchus* was described as free living nematode and it was only around 1952 when its role and importance as ectoparasites of woody and herbaceous plants was recognized. Today, many species of *Paratylenchus* are known to be pathogenic to their hosts (Jenkins, 1956; Thorne and Allen, 1950; Corbett, 1966) yet, efficacy of antinematodal measures pertaining to this group of nematode have not been thoroughly studied. With the pathogenicity proof of *P. prunii* to peach seedlings (Sharma and

Sharma, 1986), it was thought desirable to evaluate few pesticides for its successful chemical control.

Materials and Methods

The experiment was conducted in two sets (in water phase and in soil phase) *in vitro*. Initially 10 per cent concentrations of each of the pesticide (except for two granular formulations) as stock suspension was prepared in Dimethyl sulfoxide (DMSO) or water depending upon the pesticidal formulations. This stock suspension was further diluted for making lower concentrations as per the requirements. Freshly extracted nematodes were collected and nematode suspension was so standardized that every ml contained 250-300 individuals.

Water phase

Seven pesticides namely: (i) Methyl parathion (Metacid 50 EC). (ii) For-mothion (Anthio 25 EC). (iii) Carbaryl (sevin 50 WP). (iv) Quinalphos (Ekalux

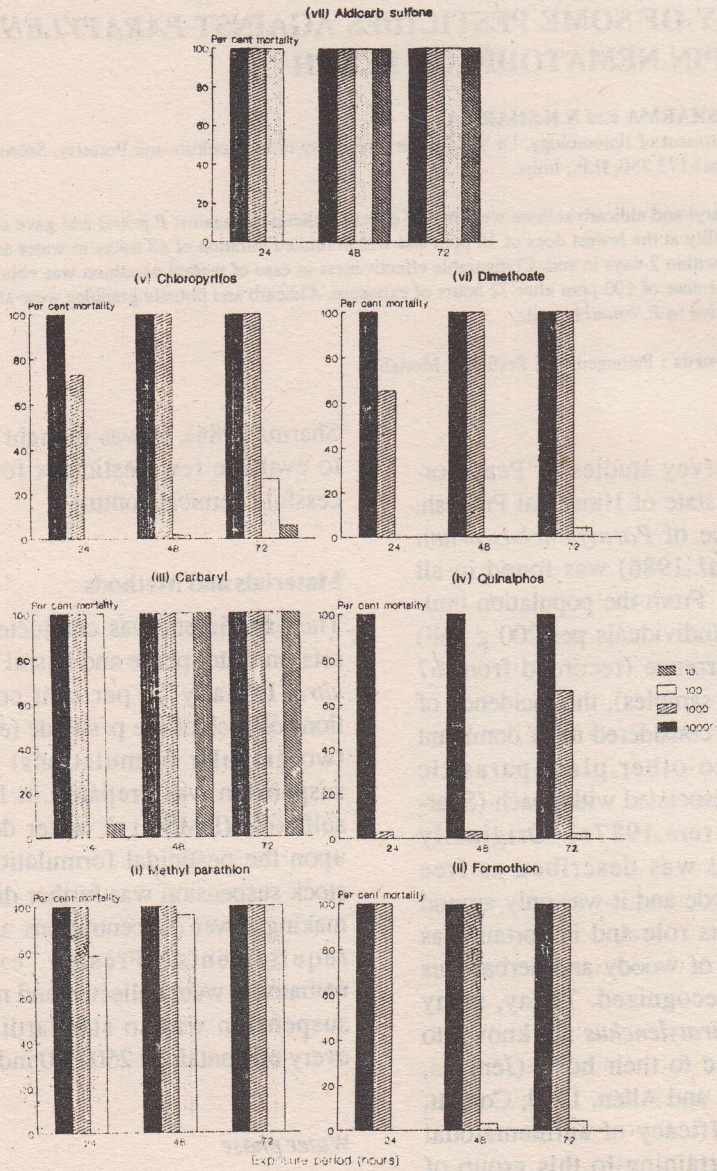


Fig. 1: Toxicity of pesticides in ppm to *P. prunii* (Water phase)

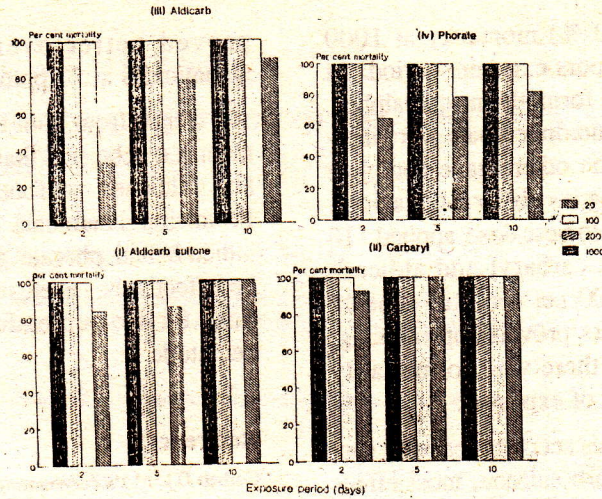


Fig. 2: Toxicity of pesticides in ppm to *P. prunii* (Soil phase)

25 EC). (v) Chlorpyrifos (Dursban 20 EC), (vi) Dimethoate (Rogar 30 EC) and (vii) Aldicarb sulfone (Temik 70 WP) were tested at concentrations of 10000, 1000, 100 and 10 ppm. The pesticides used were prepared into double the required concentrations from the stock suspension and one ml of each was put in each cavity block separately containing one ml of nematode suspension, so as to get required concentrations. Each treatment was replicated three times alongwith one untreated check. Observations were recorded after an exposure periods of 24, 48 and 72 hours.

Soil Phase

Four pesticides namely (i) Aldicarb sulfone (Temik 70 WP), (ii) Carbaryl (Sevin 50 WP); the most effective under water phase, (iii) Aldicarb (Temik 10 G) and (iv) Phorate (Thimet 10 G) were tried at four concentrations :1000, 200, 100 and 20 ppm. Each treatment were replicated

three times alongwith one untreated check. Observations were recorded after an exposure periods of 2,5 and 10 days. Sterlized plastic beakers of 10 cm diameter, each having 100 g of dry autoclaved soil were inoculated with one ml of nematode suspension (containing 250-300 nematodes). Pesticides used were prepared into double the concentrations required. Hundred ml of each concentration was poured into beakers to get the required concentrations.

Results and Discussion

Water phase - From the Fig.1, it is clear that 10,000 ppm dose for all the pesticides tested was highly effective and resulted in 100 per cent mortality in 24 hours exposure period. At 1000 ppm, excluding chlorpyrifos, dimethoat and quinalphos remaining pesticides were equally effective to 10000 ppm. Except for quinalphos, all the pesticides showed

complete (100 %) mortality at 1000 ppm after 72 hours exposure period. At 100 ppm dose, formothion, quinalphos, chloropyrifos and dimethoate were ineffective while the others gave complete kill at varying exposure durations (Fig.1). At the lowest dose applied (10 ppm) whereas, carbaryl and aldicarb sulfone gave 100 per cent kill after 48 hours. the others proved unpromising. In control set, there was no mortality within 72 hours of exposure.

Soil phase- In this set of experiment carbaryl and aldicarb sulfone, most effective under water phase were compared with two known granular nematicides aldicarb (Temic 10 G) and phorate (Thimet 10 G). The data(Fig. 2) revealed that whereas, all the four pesticides were equally effective in three out of four concentrations tested, carbaryl and aldicarb sulfone

proved better over two granular nematicides at 20 ppm dose.

Hence from both the sets of experiment it can be said that though, carbaryl and aldicarb sulfone are the most Promising chemicals against *P.prunii*, aldicarb and phorate granules can also be effectively tested under field conditions for the successful control of this nematode.

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