Note brève

NEMATICIDAL POTENTIALS OF SOME NATURALLY-GROWING MEDICINAL PLANTS AGAINST *PRATYLENCHUS ZEAE*

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Many wild and cultivated medicinal plants have been shown to possess nematicidal properties against several plant-parasitic nematodes (Desai, Shah & Pillai, 1973; Egunjobi & Afolami, 1976; Saxena, Chhabra & Jasial, 1977; Haseeb *et al.*, 1978; Sitaramaiah & Singh, 1978; Vijayalakshmi & Prasad, 1979; Vijayalakshmi, Mishra & Prasad, 1979; Prot & Kornprobst, 1983; Mani *et al.*, 1986; Akhtar & Alam, 1989; Mojumder *et al.*, 1989; Stephen, Al-Askari & Antoon, 1989). A great variety of annuals and perennials of medicinal value abound the rain-forest and savanna areas of Nigeria. However, except for neem, *Azadirachta indica* Juss. (Egunjobi & Afolami, 1976), no attempt has ever been made in this country to evaluate their nematicidal potentials. In the present study, leaves of six naturally-growing plants and trees of medicinal value were tested for their nematicidal effect on the development of *Pratylenchus zeae* Graham, 1951 on chilli (*Capsicum frutescens* L.) cv. PL 2289.

Three different doses viz., 25, 50 and 100 g/kg soil (representing 56, 112 and 224 t/ha), of thoroughly washed and chopped leaves of *Abrus precatorious* L. (fam. Papilionaceae), *Acacia albida* Del. (fam. Mimosaceae), *Albizia adianthifolia* (Schum.) W. F. Wight. (fam. Mimosaceae), *Azadirachta indica* Juss. (fam. Meliaceae), *Cnestis ferruginea* DC (fam. Connaraceae) and *Tamarindus indica* L. (fam. Caeselpiniaceae) were each added to 1 kg heat-sterilized soil contained in each of 15 cm diameter clay pots. A period of two weeks was allowed for decomposition of the amendements during which the pots were watered at regular intervals to ensure proper decomposition. At the end of decomposition period, two week-old seedlings of chilli cv. PL 2289, raised in heat-sterilized soil, were transplanted singly into each pot. A week later, each pot was inoculated with 1 000 specimens of *P. zeae* obtained from the pure culture maintained on tomato in microplots. Each treatment was replicated five times and a similar number of unamended but inoculated pots served as control.

The pots were arranged in a completely randomized design on elevated benches in the screenhouse, where atmospheric temperature ranged between 20-24 °C during the course of experiment. The experiment was terminated 90 days after inoculation. Nematode populations in soil and roots were estimated and fresh weights of shoots and roots of plants were determined. Oostenbrink's " Reproduction factor " *(R = Pf/Pi)* (Oostenbrink, 1966) was calculated as the final nematode population (Pf) divided by initial nematode population (Pi). The experiment was conducted during July-September, 1987 and repeated during the same months in 1988.

Of the six plant species tested, incorporation of leaves of *A. precatorious* allowed the highest multiplication of the nematode population, while *A. indica* allowed the lowest. The remaining four plant species viz., *A. albida*, *A. adianthifolia*, *C. ferruginea* and *T. indica*, exhibited nematode toxicity to varying extents in between these two extremities (Fig. 1). The differences in between the plant species means were highly significant on Duncan's multiple range test. When the same plant species was studied at different doses, it was observed that *A. precatorious* was ineffective at all the three doses in reducing nematode population, while *C. ferruginea* caused a decline only at the dose of 100 g/kg and the difference was statistically significant. *A. indica*, *A. albida*, *T. indica* and *A. adianthifolia* significantly reduced the nematode population at all the three doses with significant population decrease with each increase in the dose. Chopped leaves of *A. indica* at the dose of 100 g/kg caused the greatest decline in nematode population followed by those of *A. albida*, *T. indica* and *A. adianthifolia* in that order at the same dose (Fig. 1). The decline in nematode population consequent to these treatments might be due to nematicidal nature of hitherto unknown products of decomposition as suggested by Thorne (1961), Hunt, Hortenctine and Smart (1973), Singh and Sitaramaiah (1973), and Egunjobi and Afolami (1976).

Plant growth of chilli in all the treatments was considerably more than the control plants (Fig. 1). However, plants grown in soil amended with leaves of *A. indica*, *A. albida*, *T. indica* and *A. adianthifolia* had more root and shoot weights than those grown in soil amended with leaves of *A. precatorious* and *C. ferruginea*. There was a direct relationship between the dose of amendment and plant growth. The general increase in plant weight may be attributed to the fact that incorporation of soil with leaves also provided organic matter and, therefore, additional nitrogen to the plants. At the same

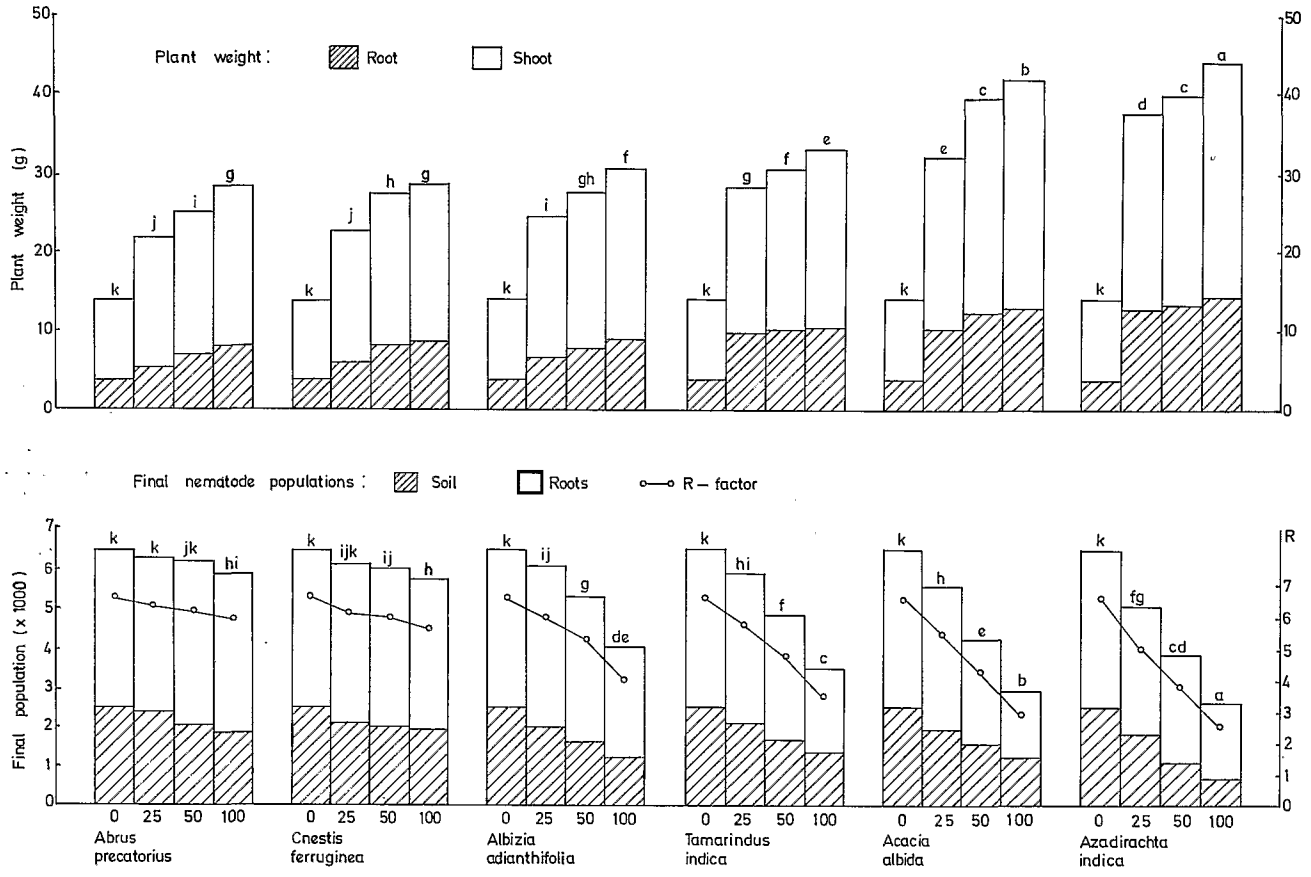

Fig. 1. Effect of soil amendment with three doses of chopped leaves of six medicinal plants on the development of *Pratylenchus zeae* and growth of chilli (*Capsicum frutescens* L.) cv. PL 2289. Treatments with same letter(s) are not significantly different on Duncan's multiple range test.

time, reduction in nematode population due to nematicidal effects of certain amendments reduced the nematode damage to plants resulting in better growth.

It is concluded that leaves of *A. indica, A. albida, T. indica* and *A. adianthifolia* have strong nematicidal properties and their addition to soil adversely affects the development of *P. zeae* and results in better growth of chilli plants. Though these findings cannot be applied to field conditions in their present form due to bulk-requirement of leaves for treatment of large areas, they can safely be used in nurseries of vegetables such as chilli, onion, tomato, egg plant, where damages due to infection of *P. zeae* and certain other endo- and ectoparasitic nematodes are considerable in this country. This work may also lay the foundation for search of plant-based nematicides.

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Accepté pour publication le 19 décembre 1989.

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