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Nematicidal potential of extracts from some selected plants against the root-knot nematode, *Meloidogyne incognita*

Bukola Aminu-Taiwo¹, B Fawole² and A O Claudius-Cole²

¹National Horticultural Research Institute, Nigeria

²University of Ibadan, Nigeria

The use of botanical extracts for controlling plant parasitic nematodes is becoming more popular because of the problem of environmental pollution arising from the use of persistent pesticides. Some nematicides have been banned, yet the farmers still use them. This poses danger to human, the environment, beneficial microbes in the soil as well as underground body water. This emphasizes the need for new methods of control such as the use of environmentally-friendly plant extracts. Therefore, effects of water extracts of leaves of *Tagetes erecta* (Marigold), *Tithonia diversifolia* (Mexican sunflower), *Chromolaena odorata* (Siam weed) and *Occimum gratissimum* (Tree basil) each at 3.3, 5.0, 6.6, 8.3 and 10% w/v, on eggs and second stage juveniles of *Meloidogyne incognita* were investigated *in vitro*. The efficacy of dry milled leaves of these plants at 1 t/ha and 2 t/ha and carbofuran at 1.5kg a.i./ha and 2.5kg a.i./ha were also evaluated against *M. incognita* in a screen house. Fifty *M. incognita* eggs per 1ml in water suspension were pipette and dispensed into glass blocks and 1ml of each extract at different concentrations were added. Fifty freshly hatched juveniles per 1ml were also dispensed into glass blocks and 1 ml of each plant extracts at different concentrations were also added. Distilled water served as control. Hatched eggs were counted every 24 hours for 10 days while juveniles were observed for mortality every 24 hours for five days. In the screen house, 48 pots were filled with sterilized soil. Treatments were carbofuran (1.5 and 2.5 kg a.i./ha), milled dried leaves of marigold, Siam weed, Mexican sunflower and tree basil at 1t/ha and 2t/ha each and untreated control. Two days later four seeds of cucumber were sown in each of the 48 pots. One week after germination, the seedlings were each inoculated with 10,000 *M. incognita* eggs. The treatments were arranged in a completely randomised designed with four replicates. Data were collected on Vegetative Growth (VG), Gall Index (GI), nematode reproduction and yield (g). LC50 was also determined. All data were analysed using ANOVA ($p=0.05$) and means were separated using Duncan multiple range test at 5% probability. Water extracts of *T. erecta* inhibited egg hatch by 90.5% at the highest concentration and was significantly higher than egg hatch observed in *O. gratissimum* which produced the lowest egg hatch inhibition of 70.7%. *T. erecta* also caused 100% juvenile mortality within 24 hours of exposure followed by *T. diversifolia* (59%), *C. odorata* (50%) and *O. gratissimum* 26.5% at the lowest concentration. *Tagetes erecta* extract was the most potent among the plant extracts used with LC50 of 0.31mg/ml⁻¹. In the pot experiment, *T. erecta*, *C. odorata*, Carbofuran and *O. gratissimum* reduced GI by 62.5%, 65%, 75% and 75.5%, respectively. Similarly, RKN population was reduced by 85.4% in *T. erecta*-treated pots; *C. odorata* caused 87.6% reduction and Carbofuran 93.1%. The results of this study suggest that application of these plants as botanical pesticides in the management of RKN is highly promising, especially as they are readily available in Nigeria.

Biography

Bukola Aminu-Taiwo is working as Research Scientist at National Horticultural Research Institute, Nigeria.

bukkyaminu@yahoo.com

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