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Effect of Entomopathogenic Nematode, *Heterorhabditis indica* (PDBC EN 13.3) on Banana Stem Weevil, *Odoiporus longicollis* in vitro Olivier (Coleoptera : Curculionidae)

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India is the largest producer of bananas and plantains in the world. More than 30 insect pests have been recorded on banana (Wadhi & Batra, 1964) with banana weevil borers (stem weevil, *Odoiporus longicollis* and corm weevil, *Cosmopolites sordidus*) being the key pests which limit its production. Management of banana weevil borers using chemical control methods are available, but studies pertaining to use of bioagents especially entomopathogenic nematodes (EPN) is meagre. EPN's have been recognized as an important biocontrol agents and serve as an alternative to chemical control. Hence an attempt has been made to evaluate the potential of heterorhabditid, *Heterorhabditis indica* (PDBC EN 13.3) against the banana stem weevil, *O. longicollis* under laboratory conditions. Petridish bioassay was conducted using *H. indica* against third instar grubs of banana stem weevil. The weevil was collected

from the endemic areas of Tamil Nadu and reared in the laboratory using stem and leaf sheaths of French cultivar Nendran. Entomopathogenic nematode, *H.indica* (PDBC EN 13.3) was collected from PDBC, Bangalore and cultured using Greater wax moth larva, *Galleria mellonella*. Petri dish bioassay was conducted using *H.indica* against the third instar grubs of banana stem weevil using the method of Woodring & Kaya (1998). Infective juveniles @ 10 to 100 per grub were inoculated and mortality was recorded at 24 and 72 hours after inoculation. Grub mortality was recorded in the treatments with 90 and 100 IJ's per grub after 24 hours of inoculation. 72 hours of inoculation, mortality recorded was to the tune of 33.3 per cent in the treatment with 10-70 IJ's and 66.6 per cent was observed in the treatments with 80-100 IJ's per grub. It revealed that *H. indica* was pathogenic to banana stem weevil, and can be a useful bioagent against this pest.

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Efficacy of Neem Based Pesticides Against *Meloidogyne graminicola* on Rice as Seed Treatment

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Rice root-knot nematode, *Meloidogyne graminicola* is an important pest of upland rice and causes yield loss of 16 - 32% in India (Biswas & Rao, 1971). Since neem products are gaining importance in management of nematode pests, an experiment was conducted in the net house of Department of Nematology, AAU, Jorhat, India, using different neem based commercial products.

Sterilized earthen pots (30 cm in diam.) were filled with 1 kg. autoclaved soil (soil : sand : FYM :: 2 : 1 : 1) and arranged in randomized block design (CRD) with 4 replications for each treatment. Good quality paddy seeds cv "Jaya" were sown on the surface of the soil after treating the seeds with NeemAzal F-5% @ 4% (T₁), NeemAzal F-5% @ 8% (T₂), NeemAzal F-T/s @ 4% (T₃), NeemAzal F-T/s @ 8% (T₄), Multineem @ 4% (T₅), Multineem @ 8% (T₆), Ecomeem @ 4% (T₇), Ecomeem @ 8% (T₈), Neemstar @ 4% (T₉), Neemstar @ 8% (T₁₀), Carbosulfan @ 0.05% (T₁₁) respectively for 6 hrs. along with a nematode inoculated control (T₁₂) and covered with sterilized soil (solution of neem products were prepared by taking the products as 100% concentrated). All plants were inoculated in

the root zone with 2nd stage juveniles of *M. graminicola*, one week after germination of seeds. The experiment was terminated at 60 days of sowing.

The results (Tables 1 & 2) revealed that the neem products could effectively reduce the gall number, eggmass and the final soil population with increased plant growth compared to untreated control. However, highest plant growth along with reduced nematode population were recorded in the treatments, Ecomeem 8% followed by Neemstar 4%. All the treatments except Neemstar 4% significantly showed better result in higher concentration. Dash & Padhi (1998) also found similar result by using different neem products against *Meloidogyne incognita* on tomato. The better result found in the neem products may be due to the initial protection given to the seedlings against *M. graminicola*. Neem is known to possess 70 bitter principles of which azadirachtin is a growth regulator and inhibits feeding (Devakumar & Goswami, 1992). The reduction in the eggmass number and final soil population may be due to the effect of neem meliacins present in the tested neem products.