Biodiversity of plant parasitic, predatory and entomophilic nematodes in the Western ghats region of Tamil Nadu

Executive Summary

In Tamil Nadu, the Western ghats region occupies about 2100 sq.km covering seven districts *viz*., The Nilgiris, Coimbatore, Dindigul, Virudhunagar, Theni, Tirunelveli and Kanyakumari.

i. Plant parasitic nematodes

Random survey carried out in the Western ghats areas of Tamil Nadu yielded 46 species of plant parasitic nematodes belonging to 24 genera, 7 families, 3 orders and 2 classes. The data obtained was subjected to community analysis to find out the frequency of occurrence, density and their prominence value.

The data indicated that the root knot nematode *Meloidogyne incognita* was the most frequently occurring species of plant parasitic nematodes in all the seven districts with a prominence value ranging from 35 to 54.7 followed by the spiral nematode, *Helicotylenchus incisus*. Other potential plant parasites encountered were the reniform nematode, *Rotylenchulus reniformis*, lesion nematode, *Pratylenchus coffeae*, Pigeon pea cyst nematode, *Heterodera cajani* and the burrowing nematode, *Radopholus similis*. Two new species *viz*., *Helicotylenchus brassicae* and *Tylenchorhynchus shervroyi* were identified in the present study. Other nematode species encountered were *Tylenchorynchus*

mashoodi, Hoplolaimus seinhorsti, Hemicriconemoides mangiferae, Scutellonema brachyurum, Xiphinema basiri etc.

ii. Predatory nematodes

Five genera of predatory nematodes viz., *Clarkus, Iotonchus, Coomansus, Mononchus* and *Mylonchulus* were recorded from the area surveyed. Among these *Coomansus* was found to occur more frequently in all the districts surveyed.

A new predatory nematode *Neotigronchus Kanyakumarii* n.gen.n.sp. was recorded in the Nilapparai hill area of Kanyakumari district. The genus is closely related to *Tigronchus* Kiijanova & Krall 1969 except for the presence of dorsal tooth. On an average each predator consumed only 1 - 2 plant parasitic nematodes per day.

iii. Entomopathogenic nematodes

The survey in the seven district yielded 9 isolates of entomopathogenic steinernematids and all the nine isolates were highly virulent and caused 60 100% mortality in the greater wax moth larvae *G. mellonella* with 72 hrs. The *Steimemema* isolates 2, 7 and 8 were more virulent and caused mortality within 72 hrs and isolate 4 within 96 hrs. The *Steinemema* isolates from different areas were identified as *S. siamkayai*.

Successful multiplication of *S. siamkayai* was observed in all media with a rate ranging from 2.84 to 10.02 x 10^2. The best medium for multiplication was

medium 1 containing soy flour and corn oil with multiplication rate of 10.02 x 10^2 IJ / flask, followed by medium V (7.76 x10^2) containing bengalgram flour and groundnut oil and medium VI (74 .3 x10^2) containing bengalgram flour and gingelly oil. Minimum multiplication was observed in medium IV containing greengram flour and sunflower oil (2.84 x10^2).

The informations obtained on the plant parasitic nematodes will be helpful in evolving suitable management strategies. The information on predatory nematodes would help to study the population dynamics and their ecology. There is bright scope for large scale multiplication of these nematodes and application in the nematode infested areas, which has not been attempted so far.

The virulent isolates of *Steinemema siamkayai* encountered in the present investigation can be mass multiplied in suitable media and a low cost commercial bio agent for the management of insect pests can be developed.