

Data presented in Table 1 revealed that all the combinations viz., 1, 2 and 3 per cent w/w of dry azolla were able to reduce the root-knot index significantly over the remaining treatments including control. Though, one per cent fresh azolla treatment also reduced the root-knot index significantly over control it was at par with 2 per cent which was again at par with the remaining treatments of fresh azolla and control.

The plant height was significantly more only in 2 per cent dry azolla over

control treatment, but, it was again at par with 3 per cent dry azolla. Thus, it is concluded that the use of dry azolla as biofertilizer/organic manure can help to reduce the infection of root-knot nematode, *M. incognita* in okra.

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A note on the association of *Radopholus similis* with the yellow disease of betel vine

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Betal vine (*Piper betle* Linn.) is widely cultivated all over India mainly for chewing purpose. It also forms an essential requisite in many religious and social ceremonies. The burrowing nematode, *Radopholus similis* (Cobb, 1893), Thorne, 1949 distributed extensively in South India (Koshy *et al.*, 1978), was first recorded on betel vine from coffee tracts of South Western India (D'Souza *et al.*, 1970). Later betel vine was reported to be a host of the coconut isolate of *R. similis* (Sosamma and Koshy, 1981).

In the arecanut based multispecies cropping system (arecanut, coffee, cardamom, banana, black pepper, betel vine etc.) of Chikmagalur district in Karnataka State, betel vine is trailed on to arecanut. Heavy infestation of the burrowing nema-

tode was recorded during November 1984, February and October 1985 in the randomly collected root samples of betel vine from Masige village and Jayapura village of Sringeri and Koppa taluks of Chikmagalur district. The affected vines trained on *R. similis* infested arecanut palms showed large number of yellowed leaves, heavy defoliation, lack of natural lustre and gave an appearance of a general decline. Apart from the most prominent symptom of yellowed leaves, the root system showed elongate brownish lesions and extensive rotting characteristic of the burrowing nematode infestation. The lesions could clearly be seen only on white tender roots. The root samples yielded an average population of ten nematodes/g of root. As in the case of black

pepper, it was found that teasing the lesions on roots was more effective for collection of active nematode population compared to submerging sliced roots in water at 15–20°C (Koshy *et al.*, 1975). On inoculation, healthy rooted cuttings of black pepper var. Panniyur-I and betel vine Cv. local, raised in sterile sandy loam soil in the greenhouse exhibited yellowing of the foliage, lesions and rotting of roots. Axenic population of the isolate could be cultured on carrot discs placed on 1% water agar.

The authors are grateful to Dr. K.V. Ahmed Bavappa, Director, C.P.C.R.I for

his encouragement in these studies and to Dr. N.P. Jayasankar, Joint Director, C.P.C.R.I., Regional Station, Kayangulam for providing necessary facilities.

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Plant-parasitic nematodes associated with citrus

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A survey of established citrus orchard at Govt. Valley Fruit Research Station, Srinagar was conducted from October 1983 to September 85 in order to detect the nematodes from the roots of different citrus cultivars. There were 77 cultivars of citrus viz., *Citrus reticulata* (38), *C. limon* (17), *C. citrange* (6), *C. sinensis* (6), *C. tangalin* (1), *C. paradisi* (6) and *Poncirus trifoliata* (3). Soil population of nematodes was analysed by Cobb's sieving and gravity method followed by modified Bearman's funnal method. For the extraction of larvae and females from roots, the roots were treated with 5 per cent H₂O₂ and stained with acid fuchsin.

Results indicated that high population of *Tylenchulus semipenetrans* and *Xiphinema index* was recovered in the ratio of 4 : 1 from all citrus cultivars except *P. trifoliata* which was found

moderately resistant. The other nematode species particularly *Tylenchorhynchus* sp., *Tylenchus* sp., *Helicotylenchus* sp., *Hoplolaimus* sp., *Longidorus* sp., and *Criconeoides* sp., were also detected. Chang (1980) found that *P. trifoliata* was moderately resistant to *T. semipenetrans*. The nematode population was high at 23 ± 5°C in the months of September to November and low in remaining months. Chhabra (1978) found maximum population of *T. semipenetrans* in April and again in August–September. However, slight infection of root-knot nematode, *Meloidogyne incognita* was detected on the roots of Kagzi gooti (*C. limon*) only.

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