Research Note :

Organisms associated with wilted betel vine in Vidarbha

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The devastating effect of wilt disease in betel cultivation is well known in Vidarbha. Various pathogenic and non-pathogenic reasons have been attributed earlier for betel vine wilt. Though this disease is reported to caused by different causal agents, prominent among them included *Phytophthora* (Marimuthu, 1991), *Rhizoctonia solani* and *R. bataticola* (Mc Rae, 1934), *Fusarim* spp. (Singh and Joshi, 1973) and root knot nematode (Medhane and Pawar, 1982). The losses varied from 2 to 100% as reported by different workers (Saksena, 1977). In present investigation, efforts were made to know the cause of wilt/root rot of betel vine in Vidarbha.

In all 256 samples were collected from various places in Vidarbha *viz.*, Akola, Buldhana, Amravati, Yavatmal districts, during different months and these samples were resorted to isolation for association of causal agent / organism. For this, wilted betel vine were uprooted and soil around root zone was separated by gently tapping the roots. Both the root and soil samples were collected in separate brown paper bags. The root samples along with basal stem were washed in running tap water, cut into small bits with sterilized blade and surface sterilized in o.1 % mercuric chloride solution. These bits then washed with three successive changes of distilled water to remove residues of mercuric chloride. Such bits were transferred in plates containing 20ml sterilized Potato dextrose agar medium and Corn meal agar medium. These plates were then incubated at 27 $\pm$ 2 ^{0}C for 7 days .

The participation of Pythiaceous fungi in root disease problem escapes detection because of their slow growth. Hence, technique suggested by previous workers was adapted for isolation of Pythiaceous fungi with necessary modification. Fresh potato cubes (1cm) were cut and soaked in an a aqueous solution of 100 ppm streptomycin sulfate for an hour. The soil samples from several betel gardens were placed in plates and watered to field capacity. Potato cubes were placed in the soil and incubated for fifteen hrs at 27 $\pm$ 2^{0}C, removed and rinsed throughout with distilled water. From each cube, a central cube of one cm was cut and placed in one per cent water agar (Ricker and Ricker, 1936) supplemented with 100 ppm streptomycin sulfate solution. Fungi growing from the periphery of cubes after 24-48 hrs were transferred to Corn meal agar medium slant. In addition to this, techniques suggested by several workers like leaf batting technique, apple battng of Klotz etc. were used for isolation of *Pythiaceous* fungi. The isolates obtained were purified and maintained on respective medium slants. These cultures were transferred periodically and fresh cultures were used for pathogenicity and experimental studies.

Wilt of betel vine is supposed to be a limiting factor in betel vine cultivation. Devastating effect of betel vine wilt in minimizing area under cultivation is well known. To know the present situation, about the real cause of the disease, efforts were made to collect disease sample from a number of places and in every month form August 2000 to July 2002. 256 samples were thus collected from the field and they were examined for nematode infestation. The data so obtained (Table 1) showed that out of 256 samples, 29 samples (11.32%) exhibited the presence of

Table 1 : Organisms associated with wilted betel vines

Sr. No.	Month of sample collection	No. of samples collected	No. of samples with nematode infestation	Number of diseased root yielding the fungus					
				Rhizoctonia sp.	*Fusarium* sp.	*Botryodiplodia* sp.	*Pythium* sp.	*Phytophthora* sp.	No fungus
1.	Aug.2000	10	2	7	3	-	-	-	
2.	Sept. 2000	12	-	9	1	2	-	-	
3.	Oct. 2000	21	1	19	-	1	1	-	
4.	Nov. 2000	11	4	10	1	-	-	-	
5.	Dec 2000	9	2	5	4	-	-	-	
6.	Jan. 2001	11	-	9	2	-	-	-	
7.	Feb. 2001	15	3	8	4	2	-	1	
8.	March 2001	12	2	9	-	3	-	-	
9.	April 2001	7	1	4	-	2	1	-	
10.	May 2001	5	-	3	1	1	-	-	
11.	June 2001	7	-	4	3	-	-	-	
12.	July 2001	21	2	8	8	1	-	-	4
13.	Aug. 2001	14	2	8	4	2	-	-	
14.	Sept 2001	17	1	10	5	2	-	-	
15.	Oct. 2001	12	2	11	1	-	-	-	
16.	Nov 2001	15	1	13	2	-	-	-	
17.	Dec. 2001	11	2	9	-	-	-	-	2
18.	Jan. 2002	12	2	6	4	2	-	-	
19.	Feb 2002	9	1	5	2	1	-	-	1
20.	March 2002	5	-	5	-	-	-	-	
21.	April 2002	5	-	4	1	-	-	-	
22.	May 2002	5	-	3	2	-	-	-	
23.	June 2002	5	1	3	1	1	-	-	
24.	July 2002	5	-	4	1	-	-	-	
	Total	256	29	176	50	20	2	1	7
Per cent frequency of isolation			11.32	68.75	19.53	7.81	0.78	0.39	2.73

nematode infestation. The mycoflora isolated from these samples were *Rhizoctonia*, *Fusarium*, *Botryodiplodia*, *Pythium* and *Phytophthora*. Among these, 176 samples (68.75%) yielded *Rhizoctonia*, 50 (19.53%) yielded *Fusarium* spp., 20(7.84%) *Botryodiplodia*, 2(0.78%) *Pythium* spp., 1 (0.39%) *Phytophthora* and 7 (2.73%) samples had no fungi associated with it. More number of wilted samples were obtained during the period of rainy and winter season of 2000 and 2001 while comparatively less number of sample were obtained during the summer. The frequency of association of *Rhizoctonia* with diseased root was highest. The samples, which yielded *Fusarium* or *Batryodiplodia*, were mostly infected with root knot nematodes.

The association of *R. bataticola* with betel vine was earlier reported by Chowdhury (1944). Whereas presence of *Phytophthora*, *Fusarium* and *Pythium* was reported by Ramalingam *et al.* (1985) and Agarkar (1971). The association of root knot nematode with betel vine has been reported by Jonathan *et al.*(2000) which corroborate with the present investigation.

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