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## OCCURRENCE OF *CYLINDROCLADIUM COLHOUNII* PEERALLY ON EUCALYPTS IN KERALA

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EUCALYPTS, the most productive crop in afforestation programme in the tropics and sub-tropics, was introduced on a large scale in Kerala to meet the requirements of pulp and fibre industries during the late fifties and early sixties. *Eucalyptus grandis* Hill ex Maiden and *E. tereticornis* Sm were the principal species selected to raise the commercial plantations, the former was confined more or less to the uplands and

the latter to the low lands. Fungal diseases have become a limiting factor in eucalypts plantations<sup>1</sup>. The most serious disease was the seedling blight caused by *Cylindrocladium spp*<sup>2</sup>. It causes heavy mortality, especially on unthrifty seedlings. In the nursery and out-planting the epidemic outbreak occurs during the middle of south-west monsoon (July-August). In the nursery where the seedlings are crowded the disease rapidly spreads by splash-dispersed airborne conidia produced on the diseased tissues, resulting in a blighted appearance of the whole stock within a week<sup>3</sup>. *C. quinqueseptatum* Boedijn and Reitsma is the most common species associated with seedling blight. In addition, 8 more species have been reported from Kerala<sup>4-7</sup>. *C. colhounii* Peerally is reported for the first time on eucalypts from India. This species was first isolated from the bark of *E. grandis* seedlings collected from Pamba Grassland Afforestation Division. Subsequently, it has been noticed in Kulamavu in Idukki District and Vazhachal in Trichur District. The pathogen was readily isolated in PDA. Relative pathogenicity with *C. quinqueseptatum* was tested on 10-week-old *E. grandis* container raised seedlings with an average leaf area index of 13.22. The screening was done both under controlled and field conditions. Seedlings were atomized to the point of run-off with the conidial suspensions having 225000 conidia ml<sup>-1</sup>. Under controlled conditions 25 seedlings were inoculated with each pathogen. Inoculated seedlings were kept in humid chambers; 50 seedlings were inoculated in the field. The weather was fairly wet. The blight severity was scored on the basis of the infection scale of 0-8; 0—healthy, 1—minute leaf spot, 2—leaf spot coalesced, 3—lesions on the main shoot, 4—defoliation ca. 25%, 5—defoliation ca. 50%, 6—defoliation ca. 75%, 7—complete leaf cast and 8—seedling dead. The infection index was worked out according to Horsfall and Heuberger<sup>8</sup>.

The efficacy of different fungicides in conidial germination of *C. colhounii* was evaluated. Conidia from 10-day-old culture were germinated in 100 ppm solution of Bavistin (2-(methoxyl carbamyl) benzimidazole), benzimidazole, daconil (chlorothalonil (tetrachloroisophthalonitrite), MK 23 ([N-(P-fluorophenyl) 2,3 dichloromaleimide]) and topsin M (thiophanate methyl) and in 1000 ppm solution of Bordeaux mixture. Conidia in tapwater were germinated as control. Observations were recorded on germination after 4 hr.

The culture has been deposited in CMI (Herb. IMI No.288672 and 288673) *C. colhounii* was first described from tea<sup>9</sup>. In PDA culture conidia from leaf and twig

Table 1 Disease incidence on inoculated plants

Treatment	Disease rating									Infection index
	0	1	2	3	4	5	6	7	8	
<i>C. quinque-septatum</i>	0	8	3	1	0	6	23	4	5	56.22
<i>C. colhounii</i>	8	9	3	3	12	12	3	0	0	33.33

of *E. grandis* show slight difference in length, conidia of the leaf isolate are larger,  $46.6-57.5 \times 2.7-5.5 \mu\text{m}$ , whereas conidia from the twig measure  $38.4-52.1 \times 2.7-5.5 \mu\text{m}$ . Sterile filament of the conidiophore ends in a clavate vesicle of  $5.48-6.85 \mu\text{m}$ . *C. colhounii* attacks *E. grandis* seedlings in the nursery and in plantations during the first year. In the field the symptoms were identical to those of the other species of *Cylindrocladium*. This pathogen is considered to be a foliage parasite not observed on stem, roots or to cause collar rot of seedlings<sup>10</sup>. Contrary to this observation it causes more stem lesions rather than leaf spots on *E. grandis*.

On the inoculated plants under controlled conditions initial symptoms of minute spots on leaf and twigs were visible after 18 hr. After 4 days of inoculation 14 plants showed apical dying in *C. colhounii* treatment and 21 plants in *C. quinqueseptatum* treatment. After 10 days all the plants inoculated with *C. quinqueseptatum* were dead whereas three plants inoculated with *C. colhounii* survived with stem lesions and leaf spots. Inoculation experiment under field conditions also proved that *C. colhounii* is not that virulent as *C. quinqueseptatum* (table 1). The infection index is 56.22 and 33.33 respectively in *C. quinqueseptatum* and *C. colhounii* treatments.

There was no conidial germination in Bordeaux mixture, Bavistin, MK 23 and Daconil. In Topsin M, although 2 conidia out of 422 germinated the growth of the germ tube was arrested just after emergence. In the tapwater control 93 spores out of 431 were germinated.

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## DIGENIC MALE STERILITY IN SUNNHEMP (*CROTALARIA JUNCEA* L)

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It is reported in literature<sup>1-4</sup> that male sterility in plant species may be due either to genic or genocyttoplasmic interactions. In *Crotalaria juncea*, the spontaneous occurrence of male sterility was reported earlier<sup>5</sup>. The present investigation deals with its mode of inheritance. The progeny of the male sterile line showed segregation of fertile and sterile plants in 1:1 ratio<sup>5</sup>. Since a population of sunnhemp is exclusively of a heterozygous<sup>6-8</sup> nature, controlled pollination was required to be followed during crossing. Ten male sterile plants were randomly selected from the above segregating population just after initiation of flowering because of the absence of any marker in them. Each of these sterile plants was back-crossed