# *In vitro* interactions among fungi associated with leaf rot disease of coconut

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Leaf rot disease of coconut is widely superimposed on root (wilt) affected palms in Kerala (2). Studies on the etiology of leaf rot have established fungal complex nature of the disease (3). The affected palms exhibited a range of mycoflora in leaves and specially in spindle leaflets (6). Among various fungi *Colletotrichum gloeosporioides, Exserohilum rostratum, Gliocladium vermoeseni, Fusarium solani* and *Fusarium moniliforme* var. *intermedium* were found to be in predominant association with the disease. Other fungi including *Thielaviopsis paradoxa, Rhizoctonia solani, Cylindrocladium scoparium* and *Mortierella elongata* were recorded less frequently. Pathogenic nature of these fungi have been elucidated (4, 5). Since many fungi are associated with leaf rot, a knowledge on the interaction among these fungi would provide additional information on the competitive ability within the fungal complex system. Hence the present studies were taken up.

One week old purified cultures of *C. gloeosporioides* (Cg), *E. rostratum* (Er), *G. vermoeseni* (Gv), *F. solani* (Fs), *F. moniliforme* var. *intermedium* (Fm), *T. paradoxa* (Tp), *R. solani* (Rs), *C. scoparium* (Cs) and *M. elongata* (Me), grown on potato dextrose agar medium, were used as inocula. For studies on *in vitro* interactions among the nine fungi, 36 dual combinations were inoculated on to the medium at two opposite sites with six replications. The inoculated plates were incubated at 30 ± 1°C for 5-7 days and the fungal growth monitored. The interactive behaviour of the fungi in terms of colony to colony merger and overgrowing capacity were recorded. Based on the inhibition zone, the interaction was classified as extremely mild (< 2 mm), mild (2-3 mm), moderate (4-6 mm) and strong (> 6 mm). The results are presented in Table 1.

Interaction of fungi varied in respect of colony merger, overgrowing capacity and inhibition zone. Merger of colonies with no sign of inhibitions was recorded in combinations of Cg against Er, Tp, Cs, Rs, Me; Er against Fs, Fm, Cs, Rs, Me; Gv × Tp, Fs × Cs, Fm × Cs, Tp × Me and Cs × Me. In combinations where colonies grew close to each other with either nil or extremely mild inhibition were Cg against Gv, Fs, Fm; Er × Gv; Gv against Fs, Fm, Me; Fs × Fm and Cs × Rs. In certain other dual cultures only mild (Er × Tp, Gv × Rs and Tp × Rs) or moderate (Gv × Cs, Fs × Rs and Fm × Rs) inhibitions were traced. In six combinations (Fs × Tp, Fs × Me, Fm × Tp, Fm × Me, Tp × Cs and Rs × Me) strong inhibitions were detected with their colonies remaining apart.

Earlier study (3) showed recovery of fungi from leaf rot in combinations as well. The results

**Table 1 :** Pattern of *in vitro* interactions in dual cultures among 36 combinations of nine fungi in solid medium (refer text for details on fungal abbreviations)

| Characters of fungal colony | Fungal combinations | Status of inhibiton reaction |
|---|---|---|
| Colonies merged | Cg × Er, Cg × Tp, Cg × Cs, Cg × Rs, Cg × Me, Er × Fs, Er × Fm, Er × Cs, Er × Rs, Er × Me, Gv × Tp, Fs × Cs, Fm × Cs, Tp × Me, Cs × Me | No inhibition discerned between colonies under dual cultures of the fungal combinations |
| Colonies close | Cg × Gv, Cg × Fs, Cg × Fm, Er × Gv, Er × Tp, Gv × Fs, Gv × Fm, Gv × Cs, Gv × Rs, Gv × Me, Fs × Fm, Fs × Rs, Fm × Rs, Tp × Rs, Cs × Rs | Extremely mild, mild or moderate inhibition only noticed in specific combinations; in Fs × Rs and Fm × Rs dual cultures moderate inhibition of Rs by Fs/Fm evident; similarly Gv by Cs |
| Colonies apart | Fs × Tp, Fs × Me, Fm × Tp, Fm × Me, Tp × Cs, Rs × Me | Strong inhibitions detected; Tp and Me strongly inhibited by Fs and Fm; similarly Tp by Cs and Me by Rs |

of the present study showed predominant fungi devoid of strong inhibitions/antagonism among them bearing etiological significance. The predominant fungi of leaf rot seemed to be associative rather than antagonistic among them. Prevalence of competitive interaction by *Fusarium* spp. on certain less frequent fungi of leaf rot and among such other fungi only underlines overlapping of competition mechanism (1). Behaviour of specially the predominant fungi as a group in the *in vivo* system would provide evidence on the extent of their role in disease expression.

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