

Research Article**Hyperparasitic Interaction of *Trichoderma virens* TRI 37 with *Fusarium oxysporum* f.sp. *cucumerinum* Induce Differential Display of NVOC Against Cucumber Vascular Wilt Pathogen****B Sreenayana, S Nakkeeran and P Muthulakshmi**

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Abstract

Cucumber (*Cucumis sativus* L) is an important vegetable crop grown worldwide. However, the productivity of cucumber is hampered by wilt caused by *Fusarium oxysporum* f.sp. *cucumerinum*. Isolates of *Trichoderma* spp were screened as the promising candidates for biological control of soil borne diseases. *In vitro* antagonism of *Trichoderma* against *F. o.* f.sp. *cucumerinum* revealed that *Trichoderma virens* TRI37 effectively inhibited the mycelial growth of pathogen *in vitro* in comparison with other isolates. Further, scanning electron microscopy (SEM) analysis from the zone of hyperparasitism revealed the presence of cell wall lysis, coiling and ramification of hyphae. The secondary metabolites from the effective isolate *T. virens* TRI37 inhibited the growth of pathogen upto 80.68 per cent. The nonvolatile organic compound (NVOC) of antimicrobial nature was upregulated in the zone of hyperparasitism of *T. virens* TRI37 rather than from the non hyperparasitised zone. The compounds, dl-Alanine-beta-naphthylamide, 1,4,7,10,13,16,19-Hepta-2-cycloheptacosanone, Formic acid, 2-propenyl ester, Pyrazino[1,2-a]indole-1,4-dione, 2,3-dihydro-2-methyl-3-methylene-, Propanamide, N-(1-naphthyl)-2-methyl-, Baicalein trimethyl ether and n-Hexadecanoic acid were upregulated. The upregulated compounds might be responsible for the suppression of *F. oxysporum* f.sp. *cucumerinum*. Hence, the present study suggests that, upregulation of NVOC during hyperparasitism by *T. virens* TRI37 could be explored to manage the wilt of cucumber caused by *F. o.* f.sp. *cucumerinum*.

Key words: Biocontrol, hyperparasitic, NVOC, scanning electron microscopy (SEM), *Trichoderma*

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