

The Biofumigation Activity of Volatile Compounds Produced from *Trichoderma afroharzianum* MFLUCC19-0090 and *Trichoderma afroharzianum* MFLUCC19-0091 against *Fusarium* Infections in Fresh Chilies

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Abstract : This study aimed to investigate the fumigation activities of the volatile compounds produced by *Trichoderma* spp. against *Fusarium oxysporum* and *F. proliferatum* fungi that cause significant rot in fresh chilies. Two *Trichoderma* spp. were isolated from the leaves of *Schefflera leucantha* grown in Thailand and later identified as *T. afroharzianum* MFLUCC19-0090 and *T. afroharzianum* MFLUCC19-0091. Both in vitro and in vivo dual culture volatile assays were used to study the effects of the produced volatile compounds on mycelial growth. In vitro results showed that the volatile compounds produced by *T. afroharzianum* MFLUCC19-0090 significantly inhibited the growth of *F. oxysporum*, while the volatile compounds produced by *T. afroharzianum* MFLUCC19-0091 significantly inhibited the growth of *F. proliferatum*. The effectiveness of *Trichoderma*-derived volatile compounds in inhibiting the mycelial growth of the selected pathogens in the inoculated, fresh chili samples was further demonstrated in vivo. The volatile profiles of both *Trichoderma* spp. were characterized using gas chromatography-mass spectrometry. Seventy-three volatile compounds were detected from both strains. Among the major volatile compounds detected, phenyl ethyl alcohol was found to possess the strongest antifungal activity against both pathogens. The results support the possibility of using volatile compounds produced by *T. afroharzianum* MFLUCC19-0090 and *T. afroharzianum* MFLUCC19-0091 as alternative fumigants for preventing *Fusarium* rot of fresh chilies during the post-harvest period.

Keywords : antifungal activity, biocontrol, endophytic fungi, post-harvest

Conference Title : ICAMB 2023 : International Conference on Applied Mycology and Biotechnology

Conference Location : Tokyo, Japan

Conference Dates : March 20-21, 2023