

Effect of photocatalytic reaction of TiO₂ on fruit rot fungi of rambutan

P. Jitareerat, A. Uthairatanakij, S. Photchanachai, V. Srilaong

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Abstract

The effect of the photocatalytic reaction of TiO₂ at 0 (control), 0.1, 1, 5, and 10% on spore germination and mycelial growth of *Colletotrichum gloeosporioides*, *Fusarium* sp., and *Lasiodiplodia theobromae*, the casual agents of rambutan fruit rot disease, was investigated. The results showed that the sensitivity of these three fungi to the photocatalytic reaction of TiO₂ varied. TiO₂ at 1% was the best concentration to inhibit spore germination of *L. theobromae* giving significant differences from untreated spores, whereas 1% of TiO₂ showed only a small inhibitory effect on *C. gloeosporioides* and *Fusarium* sp. Germination However, high concentrations of TiO₂ (5 and 10%) induced spore germination of these two fungi. The effect of the photocatalytic reaction of TiO₂ on mycelial growth was to retard mycelial growth of all the fungi, and the effect was related to the increase of TiO₂ concentration. Under the electron microscope the structure of spores and mycelium cultured in media containing TiO₂ at 1% showed that the spores of all the fungi were able to germinate, mycelial structure was normal, and no damage to the cell walls was observed. The results implied that the slow growth of fungal mycelia might be caused by the interference of TiO₂ particles during their growth.