

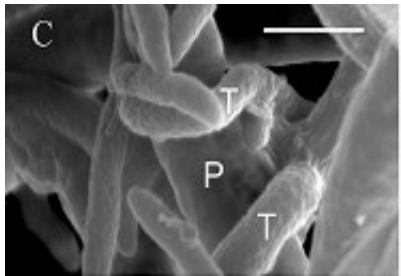
**Cite this as:** Heng JIANG, Liang ZHANG, Jing-ze ZHANG, Mohammad Reza OJAGHIAN, Kevin D. HYDE, 2016. Antagonistic interaction between *Trichoderma asperellum* and *Phytophthora capsici* in vitro. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*. **17**(4):271-282.  
<http://dx.doi.org/10.1631/jzus.B1500243>

# **Antagonistic interaction between *Trichoderma asperellum* and *Phytophthora capsici* in vitro**

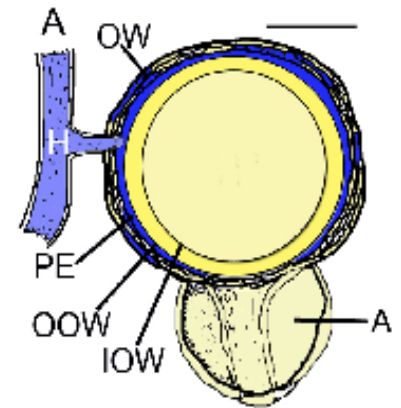
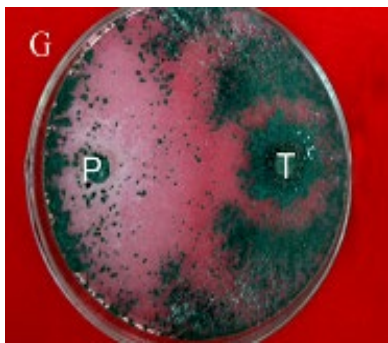
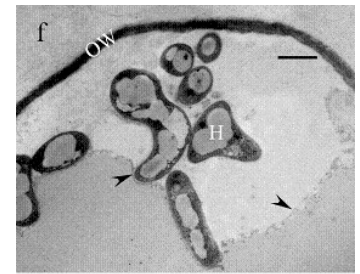
**Key words:** Antagonism, Electron microscopy, Oogonium, Oospore, Pepper

# Research Summary

This study mainly focused on interactions between fungal hyphae of *Trichoderma asperellum* and pathogenic oospores of *Phytophthora capsici* at ultrastructural level

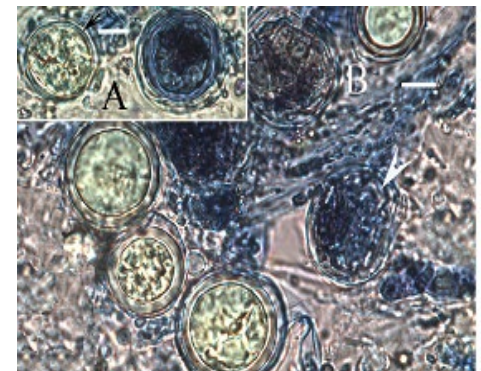
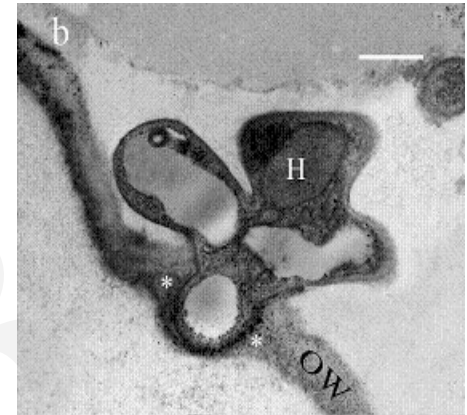


- Pathogen isolation
- Screening of antagonistic isolates of *Trichoderma* spp.
- Fungal identification
- Antagonism of *Trichoderma* strains against hyphae and oospore of *Phytophthora capsici*



# *Innovation points*

- **Antagonistic** efficacy of *Trichoderma asperellum* against *Phytophthora capsici*
- **Ability** of *Trichoderma asperellum* to collapse the mycelium of *Phytophthora capsici*
- **Infection** of the oogonia and oospores of *Phytophthora capsici* by *Trichoderma asperellum*



# *Innovation points*

**A number of figures were generated to summarize the results of this study**

- Fig. 1** | Schematic drawing of infection of oogonium and oospore of *Phytophthora capsici* by hyphae of *Trichoderma* sp.
- Fig. 2** | One parsimonious tree based on combined ITS, *tef1* and *rbp2* sequences
- Fig. 3** | Antagonism of *Trichoderma asperellum* CGMCC 6422 against *phytophthora capsici*
- Fig. 4** | Hyperparasitism of *Phytophthora capsici* oospores by *Trichoderma asperellum* CGMCC 6422
- Fig. 5** | Percentages of undamaged and damaged oospores after 7, 12, 17, 22 and 42 days
- Fig. 6** | Transmission electron micrographs (TEMs) of the interaction between oospores of *Phytophthora capsici* and *Trichoderma asperellum*
- Fig. 7** | Malformed, shrinking, aborted and degraded oospores