

**PCR COMBINED WITH GFP TAGGED VERTICILLIUM DAHLIAE CONFIRMED
THE SEEDS TRANSMISSION OF SUNFLOWER *VERTICILLIUM* WILT**

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ABSTRACT

Verticillium wilt of sunflower (*Helianthus annuus* L.) is a widespread and destructive disease caused by the soil-borne fungal pathogen *Verticillium dahliae* (*V. dahliae*). The quick spreading of *Verticillium* Wilt in sunflower planting region of China promoted us to consider the possibility of seeds transmission the pathogen. Therefore, knowledge on the contamination of the seeds by *V. dahliae* is critical for understanding the infection cycle of sunflower yellow wilt and also to develop the efficient ways to control the spreading of this disease. In this study, sunflower seedlings were inoculated with conidial suspensions of GFP tagged isolate. Colonization and developing were studied under confocal microscopes. After 12 to 96 hour post-inoculation (hpi), conidia germinated and formed hyphal colonies on the root tips and in the root elongation zones. Hyphae colonized in cortical tissues and vascular elements after 2 weeks inoculation (2wpi). 10 wpi later, the xylem of the upper stem, sunflower disc including the pericarp and seed coat, had been colonized by the pathogen. Moreover, pathogen DNA could also be detected by PCR in the pericarp and seed coat. Additional experiment was performed to detect the transmission rate of seeds of different sunflower cultivars was conducted with PCR. Our result indicated that the transmission rate of sunflower seeds ranged from 10-25% among all tested cultivars. In conclusion, seed transmission is the main way for the long distance transmission of sunflower *V. dahliae* and seed pretreatment should be done to control the infection of sunflower seedling in the future.

Key Words : sunflower (*Helianthus annuus* L.); *Verticillium dahliae* ; seed transmission