

Title Diallyl trisulfide (DATS) effectively induced apoptosis of postharvest disease *Penicillium expansum* of citrus

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Abstract

Garlic (*Allium sativum*) has long been known to have antifungal properties. The experiment demonstrated that garlic constituent diallyl trisulfide (DATS) suppressed the growth of *Penicillium expansum* (minimum fungicidal concentration (MFC₉₉) value: $\leq 90 \mu\text{g/ml}$) and promoted apoptosis via production of reactive oxygen species (ROS) and disintegration of cellular ultrastructure. The morphological changes of DATS-treated hyphal cells were analyzed by using TUNEL, Annexin-V FITC/propidium iodide and oxidant stress dichlorodihydrofluorescein. DATS treatment induced chromatin condensation, DNA fragmentation, phosphatidylserine (PS) externalization and intracellular ROS elevation. Transmission electron microscopy (TEM) investigation indicated DATS-treatment cellular ultrastructure (e.g., mitochondria) disappeared. In conclusion, DATS as one of the components of garlic was a good fungal pathogen inhibitor with many advantages, such as being common, cheap, non toxic and with high efficiency. It would be useful to further study DATS as a new antifungal agent applied in *P. expansum* control.

<http://www.springerlink.com/content/88q482n3123u56j2/fulltext.pdf>