



## **Influence of cinnamic acid on *Cylindrocarpon* root rot development on *panax ginseng***

Jiaman Sun, Junfan Fu, Rujun Zhou and Xuerui Yan

*Plant Protection College, Shenyang Agricultural University, China*

### **Abstract**

Ginseng (*Panax ginseng* C.A. Meyer) is highly valued as a medicinal herb grown in northeast China for centuries, but its yields are often reduced by a variety of root pathogens. *Cylindrocarpon* root rot, caused by *Cylindrocarpon destructans*, is a severe disease on ginseng. Some allelochemicals from ginseng root exudates and decaying residues of ginseng plant may be related to *Cylindrocarpon* root rot. The aim of this study was to evaluate the allelopathic effects of artificially applied cinnamic acid on *C. destructans* and ginseng. Cinnamic acid with concentrations ranging from 0 to 1600  $\mu\text{g/ml}$  was used in the experiment. The effects of cinnamic acid on the colony diameter, biomass and percent conidial germination of *C. destructans* were examined. Ginseng seeds were drenched with cinnamic acid solution and then incubated in a growth chamber under 25 °C. The rate of seeds germination and the length of seedlings were measured after 1-week. Results show that the hyphal growth and spore germination of *C. destructans* were inhibited by cinnamic acid. At the highest concentration (1600  $\mu\text{g ml}^{-1}$ ) of cinnamic acid, the colony diameter of *C. destructans* decreased by 100%. However, the activity of phytopathogenic enzymes (pectinase, cellulase, amylase, and protease) was greatly stimulated. At the highest concentration, pectinase, cellulase, amylase, and protease activity increased by 90.7%, 685.7%, 125% and 637.2%, respectively. A clear seed germination inhibition was observed at high cinnamic acid concentration, although the percent of seed germination was no difference compared with the control at lower concentrations. Significant seedling growth reduction was observed only at high concentration of cinnamic acid. It was concluded that cinnamic acid inhibited growth of *C. destructans* and ginseng, but dramatically stimulated activities of hydrolytic enzymes of *C. destructans*.