

### Abstract

Black rot of cantaloupe fruit, caused by *Didymella bryoniae*, can be severe when environmental conditions and fruit developmental stages are favorable for infection. Symptoms of black rot on cantaloupe fruit varied greatly depending on fruit age. The black rot phase was observed only on mature fruit. Inoculation of cantaloupe fruit at different developmental stages with five *D. bryoniae* isolates resulted in the greatest amount of decay on 10-day-old fruit compared with 20-, 30-, 40-, or 50-day-old fruit. There was no difference in lesion size among 20-, 30-, 40-, or 50-day-old fruit, although there was variation in lesion size among fungal isolates. Five fungal isolates all produced the greatest polygalacturonase (PG) activity in inoculated 10-day-old fruit compared with 20-, 30-, 40- or 50-day-old fruit. There was a positive correlation between lesion size and total fungal PG activity in decayed tissue. Using a representative *D. bryoniae* isolate (OK 963096), multiple PG isozymes were detected in both fungal shake culture and decayed fruit. Eleven PG isozymes (pI 4.7 to 7.9) were detected from fungal shake culture using pectin or polygalacturonic acid as the sole carbon source. Twelve PG isozymes (pI 4.7 to 8.7) were detected from decayed tissue of 10-day-old fruit, and 13 PG isozymes (pI 4.2 to 8.7) were observed from decayed tissue of 50-day-old fruit. The activity of *D. bryoniae* PG produced in vitro and in vivo was optimum at pH 5.0 and 5.5, respectively. The activity of the fungal PG produced in vitro exhibited primarily an endo-mode of action. In contrast, PG extracted from decayed tissue was predominately exo-PG. Thus, PG may play an important role in pathogenesis of *D. bryoniae* during cantaloupe fruit decay.