Abstract

Effects of temperature on sporulation of *Colletotrichum acutatum*, *C. gloeosporioides,* and *C. fragariae*, causes of anthracnose of strawberry, were determined in controlled-environment studies. Detached immature fruit were inoculated with a conidial suspension and incubated up to 36 days at constant temperatures of 5, 10, 15, 20, 25, 30, and 35°C. Latent period (time to first sporulation) depended on temperature and ranged from 2 to 3 days at 25°C to 6 to 17 days at 5°C. *C. acutatum* had a shorter latent period than the other species at 5 and 10°C; at higher temperatures, latent periods of the species were very similar. During the first 4 days of sporulation, there was an optimum-type relationship between the logarithm of conidia per fruit [log(*Y*)] and temperature, with maximum observed sporulation (generally 106 to 107 conidia per fruit) from 15 to 30°C. Sporulation increased over time at temperatures of 15°C and above. The greatest difference among the species was at 5 and 10°C, where tested *C. acutatum* isolates produced from 10 to 100 more conidia per fruit than the other species. Polynomial regression equations were used successfully to represent log(*Y*) as a function of temperature and incubation time. The rate of increase in sporulation over time was a function of temperature, with a predicted optimum of 22 to 26°C. Equations were validated by predicting sporulation of the three species infecting fruit attached to plants growing in controlled-environment chambers. Although the predictions tended to be slightly larger than observed, mean error [100(observed - predicted)/ observed] was only 0.7% (95% confidence interval: 2.4 to 1.0%).