

Title Postharvest fruit rots of apple in Greece: pathogen incidence and relationships between fruit quality parameters, cultivar susceptibility, and patulin production

Authors S. Konstantinou, G. S. Karaoglanidis, G. A. Bardas, I. S. Minas, E. Doukas and A. N. Markoglou

Citation Plant Disease 95 (6): 666-672. 2011.

Keywords apple; fruit rot

Abstract

The incidence of pathogens associated with postharvest fruit rots on the four most extensively cultivated apple cultivars (Red Delicious, Golden Delicious, Granny Smith, and Fuji) in Greece was surveyed during two consecutive storage periods (2008–09 and 2009–10) in five packinghouses located in northern Greece. The fungi isolated were identified based on their morphological characteristics and internal transcribed spacer gene sequencing. In the four cultivars sampled, *Penicillium expansum* and *Botrytis cinerea* were the predominant pathogens, accounting for averages of 44.2 and 23.6%, respectively, of the pathogens isolated from the sampled fruit. Two other important rot pathogens were *Alternaria tenuissima* and *Mucor pyriformis*, accounting for 16.1 and 6.6%, respectively, of the diseased apple fruit. Other pathogens such as *Monilinia laxa*, *M. fructigena*, *Botryosphaeria obtusa*, *Geotrichum candidum*, *Fusarium avenaceum*, and *F. proliferatum* were isolated at low frequencies and are considered of minor importance. Measurements of the resistance level of the four apple cultivars to fruit rot caused by *P. expansum* and *Botrytis cinerea* revealed that Golden Delicious was the most susceptible to blue mold while Fuji was the most susceptible to gray mold infections. Susceptibility to gray mold was negatively correlated with flavonoid and phenol concentration as well to fruit antioxidant activity, while susceptibility to blue mold was negatively correlated with fruit firmness and phenol concentration. Patulin production was significantly higher in Red Delicious and Golden Delicious fruit than in Granny Smith and Fuji fruit and was negatively correlated with the acidity of the fruit. The high incidence of *P. expansum* and *A. tenuissima* along with the presence of *F. avenaceum* and *F. proliferatum*, all of which are potentially mycotoxin producers, emphasize the risk for mycotoxin contamination of apple fruit juices and by-products. Furthermore, information on the distribution of the pathogens on the main cultivars may be useful for the implementation of strategies to control the diseases and minimize the threat of mycotoxin contamination on each cultivar.