

Title Involvement of gluconic acid and glucose oxidase in the pathogenicity of *Penicillium expansum* in apples

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Abstract

The contribution of gluconic acid secretion to the colonization of apple tissue by *Penicillium expansum* was analyzed by modulation (increase or decrease) of gluconic acid accumulation at the infection court. *P. expansum* isolates that express the most *gox2* transcripts and concomitant glucose oxidase (GOX) activity and that secrete the most gluconic acid cause disease of apple at the fastest rate. Cultures grown under reduced oxygen concentration generated fewer *gox2* transcripts, produced less gluconic acid, and led to a 15% reduction in disease. Furthermore, the detection of significantly high levels of transcripts of *gox2* and GOX activity at the edge of the decaying tissue emphasize the involvement of GOX in tissue acidification of the decaying tissue. Taken together, these results emphasize the importance of GOX in the production of the gluconic acid that leads, in turn, to host tissue acidification. This acidification enhanced the expression of pectolytic enzymes and the establishment of conditions for necrotrophic development of *P. expansum*.