

Abstract

The phytopathogenic fungus *Colletotrichum gloeosporioides* produces one pectate lyase (PL) that is a key virulence factor in disease development. During growth of *C. gloeosporioides*, *Colletotrichum acutatum*, and *Colletotrichum coccodes* in acidified yeast extract medium, the fungus secreted ammonia and increased the medium pH. Ammonia accumulation and the consequent pH change increased as a function of initial pH and buffer capacity of the medium. PL secretion by *C. gloeosporioides* correspondingly increased as the pH of the medium increased. The *C. gloeosporioides pelB* gene-disrupted mutant was able to increase ammonia accumulation and pH of the media similarly to the wild-type isolate. *C. gloeosporioides* in avocado, *C. coccodes* in tomato, and *C. acutatum* in apple showed ammonia accumulation in the infected area where pH increased to 7.5 to 8 and PL activity is optima. In nonhost interactions where *C. gloeosporioides* was inoculated in apples, the addition of ammonia-releasing compounds significantly enhanced pathogenicity to levels similar to those caused by the compatible *C. acutatum*-apple interaction. The results therefore suggest the importance of ammonia secretion as a virulence factor, enhancing environmental pH and pathogenicity of the *Colletotrichum* species.