First Report in North America of Atypical Symptoms Caused by *Colletotrichum coccodes* on Field-Grown Potato Tubers During Storage

Helen M. Griffiths, Thomas A. Zitter, Kent Loeffler, Department of Plant Pathology and Plant Microbe-Biology, Cornell University, Ithaca, NY 14853; Walter S. De Jong, Department of Plant Breeding and Genetics, Cornell University, Ithaca, NY 14853; and Sandra Menasha, Cornell Cooperative Extension, Suffolk County, Riverhead, NY 11901

Corresponding author: Helen M. Griffiths. hmg1@cornell.edu


*Colletotrichum coccodes* frequently causes superficial lesions on potato tubers (4); however, deep sunken lesions have been reported when tubers were artificially inoculated with *C. coccodes* and stored for 10 weeks at temperatures of 5 to 15°C (2,3).

In November 2008, we observed sunken lesions on tubers of breeding clones D40-323 (parents: NY121 × NY115) and E105-16 (NY127 × Marcy) from Ithaca, NY, storage, and on E42-15 (NY130 × NY115) and NY138 (Marcy × NY115) from Riverhead, NY, storage (Fig. 1).

![Fig. 1. Tuber of clone E105-16 showing atypical lesions associated with infection by *C. coccodes* compared with healthy tuber.](image)

The 2008 growing season (May-August) in Ithaca had normal precipitation with 35.6 cm during 68 rain events and normal temperatures averaging 18°C. June and July were wetter than normal with 25.2 cm precipitation compared with normal precipitation of 18.82 cm. A month passed between vine kill and harvest during which time there were 13 rain events totaling 4.3 cm precipitation, with about normal temperature, averaging 18°C. Tubers were stored at 13°C and 90 to 100% relative humidity.

At Riverhead, plants were irrigated to give 2.5 cm water per week, with 2 weeks between vine kill and harvest during which time there were 3 rain events resulting in 2.63 cm precipitation; tubers were stored at 4°C and 90 to 100% relative humidity. At both locations, sunken lesions were observed 6 weeks into storage. Tubers from E105-16 were planted in the greenhouse and daughter tubers showed typical black dot symptoms on stems and tubers (Fig. 2).
In February 2010, tubers from the 2009 growing season of a cross between NY139 and Marcy exhibited sunken lesions. During the 2009 growing season, Ithaca received 43.4 cm precipitation during 65 rain events and with normal temperatures. Between vine kill (27 August) and harvest (11 September) there were 4 rain events resulting in 5.49 cm precipitation. The temperature during this time was slightly below normal, 16.4°C compared to 17.2 °C. Tubers had been stored in Ithaca at 4°C and 90-100% relative humidity for about 5 months (Fig. 3).

Using Potato Dextrose agar (Difco Laboratories, Detroit, MI), cultures characteristic of a Colletotrichum species were obtained from the epidermis of all clones, with sclerotia forming abundantly although conidial release was limited. Fusarium and Alternaria species were detected at low levels. Total DNA was extracted from the epidermis of parent and daughter tubers of E105-16, and NY139 × Marcy cross tubers using a DNeasy Plant mini kit (Qiagen Inc., Valencia, CA). PCR was performed with GoTaq Green (Promega Corp., Madison, WI) using C. coccodes specific primer pair Cc1NF1 and Cc2NR1 following methods described by Cullen et al. (1). The diagnostic 349 bp band was obtained for all samples. PCR amplicons were treated with ExoSAP-IT (USB Corp., Cleveland, OH) prior to sequencing (Cornell University, DNA sequencing facility, Ithaca, NY). The sequences of the PCR amplicons from the 3 tubers showed 98% identity to C. coccodes strain CPOS1 (Genbank accession no. GQ485588). It is likely that C. coccodes is responsible for the sunken lesions.

As cv. Pike is the parent of clone NY127 and grandparent of clones that have NY115 as a parent, there could be a genetic component to the appearance of these lesions however, similar lesions were observed on cv. Charlotte, which is unrelated to cv. Pike (2). Studies are planned to elucidate the factors involved in the occurrence of these atypical lesions.

To our knowledge, this is the first North American report of C. coccodes causing serious atypical lesions on potato tubers during storage.

Fig. 2. Tuber showing typical symptoms associated with C. coccodes infection generated from grow-out of tuber from clone E105-16 with atypical lesions shown in Fig. 1.

Fig. 3. Tuber from NY 139 × Marcy cross (2009 growing season) with lesions associated with infection by C. coccodes.
**Literature Cited**


