First Report of *Botrytis cinerea* as a Postharvest Pathogen of Blueberry in Korea

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Gray mold of blueberry caused by *Botrytis* sp. is reported for the first time in Korea. A detailed description of the fungus is given, along with its rDNA internal transcribed spacer sequence. The fungus was identified as *Botrytis cinerea* based on mycological characteristics and molecular data.

**KEYWORDS**: *Botrytis cinerea*, Gray mold, Postharvest disease

Blueberry (*Vaccinium corymbosum*), a flowering plant with dark-purple berries, is sold fresh, processed as frozen fruit and juice, or as dried goods such as jellies, jams, and blueberry pies. A gray mold that was a morphologically distinct *Botrytis* sp. was observed on blueberries in a storage room at Gyeongsangnam-do Agricultural Research and Extension Services, Jinju, Korea. Infection rates reached 8% in August and September of 2010. *Botrytis* diseases appear primarily as blossom blights or fruit rots, but they also cause harvest diseases in various crops [1]. The pathogen favors cool and humid conditions, causing considerable losses during storage [2].

**Symptoms.** Symptoms of gray mold were observed on harvested fruits after 2~3 days of storage in a refrigerated room. The symptoms usually started with wrinkles, atrophy, crouch down, and depression on the fruit surfaces (Fig. 1A). Accordingly, the heavily infected fruits rotted. Because the symptoms appeared quickly in a refrigerated room, the fruits may have been infected while they were in the field.

**Mycological characteristics.** A causal fungal pathogen was isolated from freshly infected fruits. The optimum temperature for mycelia growth or sclerotia formation was 20°C. The sclerotia, which were flat or irregular in shape and black in color, formed abundantly on potato dextrose agar (Fig. 1B). Detailed microscopic examinations of a representative isolate were performed using a model 1420VP scanning electron microscope and an Axioplan 2 light microscope (Carl zeiss, Göttingen, Germany). The conidia were one-celled, ellipsoid or ovoid in shape, colorless or pale brown, and 8–16 × 5–10 µm in size. Conidiophores were brown in color and 16–31 µm in length (Table 1, Fig. 1C).

**Pathogenicity test.** Thirty berries of the ‘Northland’ cultivar (*V. corymbosum*), were surface-sterilized with 1% NaOCl, rinsed in sterile distilled water three times, and allowed to dry. The surface-sterilized blueberries were placed on moist filter papers in a plastic box (29 × 22 × 15 cm). The conidial suspension (3 × 10⁴ conidia/mL) of the causal pathogen was added dropwise to the surface of the blueberries. The inoculated blueberries were kept in a humid chamber with 100% relative humidity at 20°C for 24 hr then placed on a laboratory table at room temperature for observation. The first symptom appeared on the blueberries with mycelia and conidia after 4 days of inoc-

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Gray Mold of Blueberry Caused by *Botrytis cinerea*

The causal pathogen was re-isolated from the lesions to confirm Koch’s postulates. The pathogenicity test was conducted twice.

**Internal transcribed spacer (ITS) sequence analysis.**

To confirm identity of the causal fungus, the complete ITS rDNA of the representative fungal pathogen was amplified and sequenced using primers ITS1 (5'-TCCG-TAGGTGAACCTGCGG-3') and ITS4 (5'-TCTTCCGCT-TATTGATATGC-3') as described by White et al. [4]. The resulting 613-bp sequence was deposited in GenBank (accession No. HQ455788). Phylogenetic analysis was conducted using MEGA4 software, with the neighbor-joining method and the Tajima-Nei distance model. In the phylogenetic tree (Fig. 2), the isolate was placed within a clade comprising reference isolates of *Botrytis cinerea* [5].

On the basis of mycological characteristics, pathogenicity testing in host plants, and molecular data, the fungus was identified as *B. cinerea* Persoon: Fries [3]. To our knowledge, this is the first report of gray mold on blueberry caused by *B. cinerea* in Korea [6]. The representative culture of the fungus is stored at the Korean Agricultural Culture Collection (KACC 45439), National Academy of Agricultural Science, Rural Development Administration, Suwon, Korea.

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