Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Powdery Mildew Caused by *Blumeria graminis* on *Poa pratensis* var. *anceps* ‘Qinghai’ in China

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Poa pratensis, an important cool-season perennial grass, is widely cultivated for construction of grasslands and ecological management of the Qinghai-Tibet Plateau (Dong et al. 2020). *P. pratensis* var. *anceps* Gaud cultivar Qinghai (PPAQ) is a variant of *P. pratensis* (Liu et al. 2009). In June 2016, powdery mildew was observed on PPAQ in an artificial field of PPAQ in Haiyan County of Haibei Tibetan Autonomous Prefecture, Qinghai Province, China (36°59'17.76" N, 100°52'54.01" E). Approximately 30 to 50% of leaves (approximately 10 ha) were affected. Initially, irregular white mycelial colonies were observed on the adaxial surface of affected leaves. The colonies increased in number and size, and later covered a large area of leaves and stems. In advanced stages of disease, the colonies covered the whole adaxial surface and white patches appeared on the abaxial surface of affected leaves and eventually caused leaf death. Conidiophores were unbranched, measuring 160 to 235 by 4 to 13 µm, and borne vertically on hyphae. Each conidiophore produced 4 to 11 conidia in a chain. The conidia were oval, one-celled, and hyaline, measuring 22 to 40 by 10 to 21 µm ($n = 50$). Chasmothecia were yellow, spherical, and 172 to 240 µm in diameter ($n = 20$), each of which contained 8 to 17 asci. The appendages were few and hyphoid. Asci were oblong or ovate, measuring 79 to 115 by 31 to 45 µm ($n = 20$). Asci were petiolate, containing eight ascospores. Ascospores were round to oval, colorless, and one celled, measuring 17 to 33 × 8 to 14 µm ($n = 50$). Based on morphological characteristics, the fungal organism was identified as *Blumeria graminis* (DC.) Speer. To confirm the identification, the internal

transcribed spacer (ITS) of 612 bp was amplified from DNA of conidia using ITS5 and P3 primers (Takamatsu et al. 2016). The ITS sequence was deposited in the GenBank database (accession no. MF429949). The ITS showed 95% sequence similarity with those of *B. graminis* on *P. nemoralis* in the United States (accession no. AB273560) and on *P. bulbosa* in Iran (accession no. AB273551) (Inuma et al. 2007). Five 2-month-old healthy plants were inoculated by spraying a spore suspension (1×10^5 conidia ml⁻¹) prepared from conidia brushed from infected plants; five plants sprayed with sterile distilled water served as controls. All of the plants were maintained in a growth chamber with a constant temperature of 20°C, a diurnal cycle of 12 h of light and 12 h of darkness, and 70% humidity. Two weeks after inoculation, symptoms of powdery mildew were observed on all inoculated plants, whereas the control plants remained symptomless. The same fungus was confirmed by morphological characterization and molecular assays as described above. *B. graminis* has been reported on *P. pratensis* in the United States (Dugan and Newcombe 2007), Israel (Voytyuk et al. 2009), and China (Zhang et al. 2014) but has not previously been reported on PPAQ. As far as we know, this is the first report of powdery mildew caused by *B. graminis* on PPAQ in China. These findings indicated that the health of PPAQ was substantially threatened when infected by powdery mildew; therefore, our results also contributed some valuable information on how to diagnose and control this disease on PPAQ in China.

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The author(s) declare no conflict of interest.

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