Disease Note

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Crown Rot Caused by *Fusarium algeriense* on Wheat in Kyrgyzstan

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Fusarium crown rot of wheat is an economically important disease that leads to significant yield and quality losses, especially in arid and semiarid wheat-growing areas worldwide. In June 2020, winter wheat (*Triticum aestivum* L.) plants exhibiting crown rot symptoms were identified in a commercial field in Tokbay (43.033719°N, 74.325623°E), Chuy Province, Kyrgyzstan. Diseased plants were stunted and had brown discoloration on internodes of the stem bases and roots. Disease incidence was ~3%. Ten plants from the field were sampled at the ripening stage to identify the causal agent. Symptomatic tissues were excised, surface disinfected with 1% NaOCl, rinsed three times with distilled water, placed on one-fifth strength potato dextrose agar (PDA), and incubated at 23°C in the dark for 5 days. Eight *Fusarium* isolates were recovered from tissues and purified by the hyphal tip method onto fresh PDA and Spezieller-Nährstoffarmer agar (SNA) plates (Leslie and Summerell 2006). Sequence analyses of the translation elongation factor 1α (*TEF1*) and the RNA polymerase II beta subunit (*RPB2*) genes were performed with primers EF1 and EF2 (O'Donnell et al. 1998) and 5f2 (Reeb et al. 2004) and 7cr (Liu et al. 1999), respectively. The sequences of three isolates showed 100% identities with the corresponding sequences of strain NRRL 66652 of *Fusarium algeriense* Laraba & O'Donnell (*TEF1*: MF120515 and *RPB2*: MF120504). Sequences of a representative isolate (KyrFa01) were deposited in GenBank (*TEF1*: OM135603 and *RPB2*: OM135604). On PDA, fungal colonies were initially yellowish-white but gradually turned yellowish-brown. Ellipsoidal microconidia produced in false heads on monophialides were usually aseptate (8.30 ± 1.17 µm, $n = 50$) and occasionally one-septate (21.89 ± 2.01 µm, $n = 50$). Sporodochial macroconidia were mostly three- to four-septate, 43.41 ± 2.83 µm ($n = 50$), slightly curved, and formed generally on monophialides on SNA. No chlamydospore formation was detected after 15 days on SNA or PDA. Morphological characteristics described above were consistent with the morphology of *F. algeriense*, as reported by Laraba et al. (2017). To confirm pathogenicity, seeds of wheat cultivar Seri 82, Fusarium crown rot susceptible, were treated in 1% NaOCl for 2 min, rinsed twice, and placed in plates with a piece of sterile filter paper saturated with water to induce germination for 3 days. Five pregerminated seeds were placed on the soil surface for each 9-cm-diameter pot, which was filled with a sterile potting mix containing peat, vermiculite, and soil (1:1:1 by v/v/v). A 1-cm-diameter mycelial plug from the margin of actively growing colonies (PDA) of KyrFa01 was contacted with each seed, and then seeds were covered with the same potting mix. Seeds in control pots were treated with sterile PDA plugs. The experiment was conducted in a growth chamber in a completely randomized design with five replicated pots at 23°C with a 12-h photoperiod. Disease assessment was made after 4 weeks of inoculation. KyrFa01 induced discoloration on the crown and root tissues of inoculated plants similar to that observed in field-grown plants, whereas no symptoms were observed on control plants. The pathogen was successfully reisolated from the symptomatic tissues, confirming Koch's postulates. To our knowledge, this is the first report of crown rot caused by *F. algeriense* on wheat in Kyrgyzstan. *F. algeriense* was first described within the *Fusarium burgessii* species complex by Laraba et al. (2017) as a crown rot pathogen of wheat in Algeria. The second report of the pathogen was from wheat-growing areas in Azerbaijan (Özer et al. 2020a), and this report from Kyrgyzstan is the third. Özer et al. (2020b) confirmed the coexistence of this pathogen with other *Fusarium* species. The result warrants the need to further investigate the potential of this species in the Fusarium crown rot complex of wheat.

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