

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

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11 *Fusarium algeriense* Laraba & O'Donnell has been recently described as a novel crown rot
12 pathogen of wheat within *F. burgessii* species complex (Laraba et al. 2017). To our
13 knowledge; there are no reports of the existence of this pathogen outside of Algeria. In
14 June 2017, 14 fields in Ismailli and Oguz provinces, Azerbaijan were surveyed. Diseased
15 wheat plants exhibiting symptoms of crown rot including brown discoloration on the first
16 two or three internodes of the stem were collected before maturity, at maturity and/or
17 after harvest. To identify the pathogen, symptomatic crown and stem base tissues were
18 rinsed with tap water, surface disinfested in 1% NaClO solution for 2 min, and then rinsed
19 with sterile distilled water, and air dried. The sections (1 cm) of symptomatic tissues were
20 placed on 1/5 strength potato dextrose agar (PDA) and incubated in the dark at 20°C for
21 5 days. Pure isolates which possessed typical morphology of *Fusarium* were grown on PDA
22 and Spezieller-Nährstoffarmer Agar (SNA) (Leslie and Summerell 2006). The primers
23 ITS1/ITS4 (White et al. 1990), EF1/EF2 (O'Donnell et al. 1998), and F5/R8 (O'Donnell et
24 al. 2010) were used to amplify and sequence portions of the internal transcribed spacer
25 (ITS), translation elongation factor 1 α (*EF-1 α*), and the largest subunit of RNA polymerase
26 (*RPB1*) loci of two representative isolates. A BLAST search of the sequences showed 100%
27 identity with ITS (MF120481), *EF-1 α* (MF120514), and *RPB1* (MF120492) sequences of *F.*
28 *algeriense* strain NRRL 66651. The sequences of the two isolates generated during the
29 present study were deposited in GenBank under accession nos. MN172530-31 (ITS),
30 MN173814-15 (*EF-1 α*), and MN173816-17 (*RPB1*), respectively. Colony color of the
31 isolates on PDA varied from yellowish-white to brownish-gray. Chlamydospores were
32 absent. Ellipsoidal microconidia were produced on aerial monophialides, usually aseptate
33 and measured $7.46 \pm 1.06 \times 2.75 \pm 0.34 \mu\text{m}$ ($n=50$). Straight to slightly curved macroconidia
34 with curved apical and distinct basal foot cell measuring $30.86 \pm 2.72 \times 4.43 \pm 0.42 \mu\text{m}$
35 ($n=50$) mostly 3-septate were formed generally on monophialides on SNA surface. As a
36 result, out of the 59 *Fusarium* spp. isolates, four isolates from two fields (one for each
37 province) were identified as *F. algeriense*. To assess their pathogenicity on wheat, five
38 germinated seeds of the susceptible cv. Seri 82 to other *Fusarium* spp. were placed in a 9
39 cm diameter pot filled with a sterile mixture substrate containing equal volumes of peat,
40 vermiculite, and soil. Approximately 1-cm diameter mycelial plugs from cultures of each

1 isolate were placed in contact with the seeds. Seeds inoculated with sterile agar plugs were
2 used to serve as control. The seeds were covered with the same mixture substrate and
3 then the pots were transferred to a growth chamber of $23\pm 2^{\circ}\text{C}$ and 14-h photoperiod. The
4 experiment was conducted twice with five replicate pots per isolate. Four weeks post-
5 inoculation, discoloration of the crown was observed on the inoculated plants, while no
6 symptoms were observed on the control plants. Koch's postulates were fulfilled by
7 reisolating and identifying the pathogen based on morphology described above. This is the
8 first report of *F. algeriense* causing crown rot of wheat in Azerbaijan. Azerbaijan is the
9 second country after Algeria in which the pathogen was detected. Although all Algerian
10 isolates were obtained from durum wheat, isolates in this study were isolated from bread
11 wheat. Further investigation is needed to understand its potential distribution and impact
12 on wheat crops.

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1 Figure captions

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3 eXtra Fig. 1. Neighbor joining tree of *Fusarium* spp. isolates based on combined
4 sequences of ITS, *EF-1 α* , and *RPB1* loci. Numbers on the branches represent bootstrap
5 values obtained from 1000 bootstrap replications.

6 eXtra Fig. 2. Crown rot symptoms caused by *Fusarium algeriense* on wheat seedling

7 eXtra Fig. 3. Macro and microconidia of *Fusarium algeriense* (a: 630x, b: 400x
8 magnification)

9 eXtra Fig. 4. Monophialides of *Fusarium algeriense* (a & b: 400x, c: 630x magnification)

10 eXtra Fig. 5. Colony morphology of *Fusarium algeriense* after 7 d of growth on PDA in
11 dark.