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DISEASE NOTES



First Report of *Rhizoctonia solani* AG-4 HGII and AG-2-1 Causing Root Rot of Wheat in Azerbaijan

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In summer 2017, an intensive field survey was carried out in the major wheat growing areas of Azerbaijan to identify root and crown rot fungi associated with winter wheat. Plants showing root and crown rot symptoms were collected from 76 wheat fields and transferred to the laboratory. Small sections of necrotic or discolored root, crown, and subcrown tissues of the plants were surface disinfested with 1% sodium hypochlorite solution for 3 min, triple rinsed with sterile distilled water, dried on sterilized filter paper, and placed on 1/5 strength potato dextrose agar amended with 25 mg/liter of chloramphenicol and 100 mg/liter of streptomycin sulfate. *Rhizoctonia* spp. characteristically having obvious right-angled branching, septa near the branching point, and constrictions at the base of hyphal branches were consistently isolated from the samples representing six fields in Kurdamir, Barda, Ismailli, and Oguz locations. Isolates were purified using the hyphal-tip method and

designated strains 3, 41, and 82 to 85. For the determination of binucleate or multinucleate status, hyphal cells of each isolate were stained with 0.5% safranin O and 3% KOH and observed at 400× magnification. Strains 41, 84, and 85 were identified as binucleate *Rhizoctonia*, whereas strains 3, 82, and 83 were multinucleate *Rhizoctonia solani* determined as anastomosis groups AG-2 and AG-4 by pairing with known AG tester strains. Further AG identity of isolates was conducted by sequencing of the internal transcribed spacer (ITS) region of rDNA. The result of analyzing the ITS sequences of isolates using BLAST algorithm were as follows: sequences of strains 82 and 83 (GenBank accession nos. MG654490 and MG654491) were 100% identical to *R. solani* AG-4 HGII sequence (AB000020), whereas strain 3 (MH819798), strain 41 (MH819799), strain 84 (MG654435), and strain 85 (MG654436) were about 99 to 100% identical to *R. solani* AG-2-1 (KC590550) and binucleate *Rhizoctonia* spp. AG-Fa (DQ102438), AG-K (AB286932), and AG-G sequences (DQ102395) in GenBank, respectively. A pathogenicity assay was performed using a colonized wheat kernels method adapted from [Demirci \(1998\)](#) on the wheat cultivar Seri 82 in plastic pots (17 cm in long and 9 cm in diameter). Inoculation was carried out immediately by placing 10 colonized wheat kernels in contact with the seeds, and sterile wheat kernels were used in control treatments. Four weeks after incubation at 12-h photoperiod and 24°C, plants were harvested, washed, and investigated for discoloration or lesion on crown and subcrown internode tissues. The most virulent isolates were AG-4 HGII strains causing rot, discoloration, and lesions on root, crown, and subcrown internode tissues, whereas AG-2-1 strain was moderately virulent, causing only discoloration. No symptoms were observed on noninoculated plants and plants inoculated with binucleate *Rhizoctonia* spp. isolates. *R. solani* isolates were reisolated using the same procedures as describe above, fulfilling Koch's postulates. *R. solani* isolates belonging to AG-2-1, AG-3, AG-4, AG-5, AG-8, and AG-11 isolates have been previously reported to be pathogenic on wheat in Canada, Turkey, and the United States ([Broders et al. 2014](#); [Jaaffar et al. 2016](#); [Ogoshi et al. 1990](#); [Ünal et al. 2015](#)). Although detailed studies are needed to determine the distribution of disease in the country, to our knowledge, this is the first report of *R. solani* AG-4 HGII and AG-2-1 causing root rot of wheat in Azerbaijan. The isolates belonging to these AGs may impact the yields of this crop in the locations.

The author(s) declare no conflict of interest.



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