

DISEASE NOTES



First Report of *Pyricularia oryzae* Causing Blast on *Sorghum halepense* (Johnson Grass) in Iran

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Johnson grass or Johnsongrass (*Sorghum halepense*) is a grass in the Poaceae. It is a common weed in tropical and temperate climates throughout the world and is considered as one of the world's 10 worst weeds (Anderson 1969). *Pyricularia oryzae* is a major pathogen of important food



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crops such as wheat, rice millets, and weed plants (Pordel et al. 2018). In October 2017, during a blast disease survey of cereal fields in Gilan province of Iran, 20 samples of Johnson grass plants that showed typical symptoms of blast on the leaves and seeds were collected from several rice fields in which blast was observed. Leaves were surface sterilized for 2 min in 1% sodium hypochlorite, dried on filter paper, and then incubated on wet filter paper at 25°C. Conidia produced on these surface-sterilized leaf pieces were transferred to water agar. Single hyphal tips emerging from germinating conidia were then transferred to potato dextrose agar medium (PDA, Merck) (Pordel et al. 2015). Mycelia of the isolates on PDA were smooth, hyaline, branched, with septate hyphae that were 2 to 3 µm in diameter. Conidiophores were solitary, erect, straight or curved, septate, pale brown, and measured 82 to 235 × 3 to 4 µm. Conidiogenous cells were sympodial, denticulate. Conidia were pale brown, pyriform, two-septate, 19 to 27 (to 30) × 7 to 9 µm. Based on morphological characteristics, the isolates were identified as *P. oryzae* (Ellis 1971; Klaubauf et al. 2014; Pordel et al. 2015). To confirm identification, we sequenced the internal transcribed spacer (ITS) region of the rDNA for one isolate (named strain 58-1) using primers ITS4 and ITS5 (White et al. 1990). The sequence was deposited in GenBank under accession number MT229206. The ITS sequence of the isolate showed 100% identity (473/473 base pairs) with *P. oryzae* CBS 433.70 (MH859782) isolated from rice by BLASTn tool; thus, the strain was identified as *P. oryzae*. For confirming Koch's postulates, Johnson grass leaves were inoculated using methods described by Silué et al. (1992) with spore suspension of 58-1. Briefly, seeds of the Johnson grass were planted in 10-cm-diameter plastic pots that were kept in the greenhouse for 2 weeks. *P. oryzae* 58-1 was cultured on water agar onto which sterile rice leaves were placed for 21 days at 25°C

under a 12 h dark/12 h fluorescent light regime (Pordel et al. 2018). Conidia of 58-1 were scraped and washed off the rice leaves with 3 to 5 ml of sterile distilled water. Conidial suspension (10 ml, adjusted to 2×10^5 spores per 10 ml) with 0.5% gelatin was sprayed on Johnson grass seedlings (Silué et al. 1992). Plants inoculated with a solution of 0.5% gelatin were used as a control. After 5 days, typical blast-type lesions with pale centers were visible on leaves of all inoculated plants. No symptoms were observed on the control plants. The fungus was reisolated from leaf lesions of inoculated plants and morphologically identified. To our knowledge, this is the first report of blast disease on Johnson grass in Iran. Johnson grass is thus an alternative host of the pathogen and therefore could be considered as a source of inoculum for cereal crops. Consequently, weed management could be an effective way to reduce the disease by eliminating inoculum sources of *P. oryzae*.

The author(s) declare no conflict of interest.

