

July 2017, Volume 101, Number 7

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<https://doi.org/10.1094/PDIS-10-16-1450-PDN>

DISEASE NOTES

## First Report of *Fusarium temperatum* Infecting Corn in Hungary

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Corn (*Zea mays* L.) is among the major crops cultivated in Hungary. The most serious diseases of corn are seedling blight, stalk rot, and ear rot caused by different *Fusarium* species, mainly *F. graminearum* and *F. verticillioides*. Recently, species of the *Gibberella fujikuroi* species complex tend to occur more frequently. During our monitoring work at locations of importance for corn production in Hungary, we identified the newly described species *F. temperatum* in eight *Fusarium*-infected stalk samples from a total of 169 in 2014. The lower internodes of the selected stalks were tan in color and broke very easily. The internal tissue of the split stalk was also tan. The eight samples were collected from four fields located in the Northern Great Plain (Kaba) and in the Central Transdanubian (Keszthely, Sárhatvan) and Southern Transdanubian (Bicsérd) regions of Hungary. The samples were surface sterilized by shaking for 15 min in 1% NaOCl solution, then rinsed three times and dried to air dryness. The disinfected samples were placed on potato dextrose agar (PDA) and single conidia of the emerging *Fusarium* colonies were subcultured on Spezieller Nährstoffarmer agar (SNA) ([Leslie et al. 2006](#)) and PDA. The colony and conidial morphology of the isolated strains were analogous to those of *F. subglutinans*. However, using translation elongation factor (EF-1 $\alpha$ ) sequencing (primers EF-1H and EF-2T; [Molnár et al. 2015](#)), these strains were clearly identified as *F. temperatum*, recently described in Belgium ([Scauflaire et al. 2011](#)). *F. temperatum* is part of the *G. fujikuroi* species complex and is morphologically and phylogenetically closely related to *F. subglutinans* ([Scauflaire et al. 2011](#)). The EF-1 $\alpha$  sequences of four strains deposited in NCBI GenBank (accession nos. KX432279–82) were identical to each other and 99% similar to those of *F. temperatum* strains isolated in China ([Wang et al. 2014](#)). A pathogenicity test involving soil inoculation was performed as described by [Scauflaire et al. \(2012\)](#). Corn grits adjusted to 50% moisture were sterilized twice. Conidial suspensions ( $10^6$  cells/ml) of the four *F. temperatum* strains were used for inoculation (1 ml/10 g corn grits). Cultures were incubated for 3 weeks at 25°C in the dark. Sterilized potting soil was mixed with 10 g of *F. temperatum*-inoculated corn grits in 10 cm diameter pots. Ten surface-sterilized kernels of susceptible (MV09-857) and moderately resistant (MV13-296) Hungarian single-cross corn hybrids were

sown 2 cm deep in each pot. Three pots were inoculated with each *F. temperatum* strain and three pots of uninoculated controls were included. Pots were kept in the greenhouse with a 14/10 h day/night temperature regime of 25/15°C for 11 days. Reduced seed germination ability and shoot reduction were observed for corn growing in inoculated soil but not in the controls. *F. temperatum* was reisolated from inoculated seedlings and nongerminating kernels, but not from the controls. The species identification was conducted using EF-1 $\alpha$  sequences. To the best of our knowledge, this is the first report of *F. temperatum* infecting corn in Hungary.

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