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Disease Notes

First Report of *Fusarium temperatum* Causing Seedling Blight and Stalk Rot on Maize in Spain

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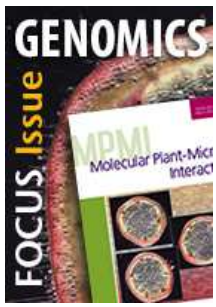

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In Europe, several diseases of maize (*Zea mays* L.) including seedling blight and stalk rot are caused by different *Fusarium* species, mainly *Fusarium graminearum, F. verticillioides, F. subglutinans*, and *F. proliferatum* (3). In recent years, these *Fusarium* spp. have received significant attention not only because of their impact on yield and grain quality, but also for their association with mycotoxin contamination of maize kernels (1,4). From October 2011 to October 2012, surveys were conducted in a maize plantation located in Galicia (northwest Spain). In each sampling, 100 kernels and 10 maize stalks were collected from plants exhibiting symptoms of ear and stalk rot. Dried kernels and small stalk pieces (1 to 2 cm near the nodes) were placed onto potato dextrose agar medium and incubated in the dark for 7 days. Fungal colonies displaying morphological characteristics of *Fusarium* spp. (2) were subcultured as single conidia onto SNA (Spezieller Nahrstoffarmer agar) (2) and identified by morphological characteristics, as well as by DNA sequence analysis. A large number of *Fusarium* species (*F. verticillioides, F. subglutinans, F. graminearum*, and *F. avenaceum*) (1,2) were identified. These *Fusarium* species often cause ear and stalk rot on maize. In addition, a new species, *F. temperatum,* recently described in Belgium (3), was also identified. *F. temperatum* is within the *Gibberella fujikuroi* species complex and is morphologically and phylogenetically closely related to *F. subglutinans* (2,3). Similar to previous studies (3), our isolates were characterized based on the presence of white cottony mycelium, becoming pinkish white. Conidiophores were erect, branched, and terminating in 1 to 3 phialides. Microconidia were abundant, hyaline, 0 to 2 septa; ellipsoidal to oval, produced singly or in false heads, and on monophialides, intercalary phialides, and polyphialides. Microconidia were not produced in chains. No

chlamydospores were observed (3). Macroconidia in carnation leaf agar medium (2) were hyaline, 3 to 6 septate, mostly 4, falcate, with a distinct foot-like basal cell (2,3). DNA was amplified with primers ITS1/ITS4 and EF1/EF2 (3). Partial sequences of gene EF-1α showed 100% homology with *F. temperatum* (3) (GenBank Accession Nos. HM067687 and HM067688). DNA sequences of EF-1α gene and ITS region obtained were deposited in GenBank (KC179824, KC179825, KC179826, and KC179827). Pathogenicity of one representative isolate was confirmed using a soil inoculation method adapted from Scauflaire et al., 2012 (4). *F. temperatum* isolate was cultured on sterile wheat grains. Colonized wheat grains (10 g) were mixed with sterilized sand in 10 cm diameter pots. Ten kernels per pot were surface disinfected in 2% sodium hypochlorite for 10 min, rinsed with sterilized water, drained (4), placed on the soil surface, and covered with a 2 cm layer of sterilized sand. Five pots were inoculated and five uninoculated controls were included. Pots were maintained at 22 to 24°C and 80% humidity for 30 days. Seedling malformations, chlorosis, shoot reduction, and stalk rot were observed on maize growing in inoculated soil and not from controls. *F. temperatum* was reisolated from the inoculated seedlings but not from the controls.

References: (1) B. J. Bush et al. Phytopathology 94:88, 2003. (2) J. F. Leslie et al. The Fusarium Laboratory Manual, page 388. Blackwell Publishing, 2006. (3) J. Scauflaire et al. Mycologia 103:586, 2011. (4) J. Scauflaire et al. Eur. J. Plant Pathol. 133:911, 2012.