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SHORT COMMUNICATTIONS

FIRST REPORT OF ROOT AND LOWER STEM ROT CAUSED BY *FUSARIUM EQUISETI* (CORDA) SACCARDO ON WHEAT AND RYE IN BULGARIA

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Abstract

YANASHKOV, I. and T. D. VATCHEV, 2016. First report of root and lower stem rot caused by *Fusarium equiseti* (Corda) Saccardo on wheat and rye in Bulgaria. *Bulg. J. Agric. Sci.*, 22: 993–994

In May 2015, severe root rot symptoms were observed on wheat (*Triticum aestivum* L.) and rye plants (*Secale cereale* L.) in heading and flowering phenophases, grown on experimental fields in Institute for Plant Genetic Resources "K. Malkov" (Sadovo), Sauth Central Bulgaria. Examination of the symptomatic plants revealed root and lower stem rot. Isolations were made from sections of roots and basal stems of diseased wheat and rye plants on standard, nonselective media such as oatmeal (OA), potato dextrose (PDA) or water (WA) agar media. Plates were incubated at 25˚C in the dark for 7 days. *Fusarium* spp. isolates were readily obtained from all examined plants with disease symptoms as well as from symptomless plant roots. Observations on colony morphology and growth were made on WA, OA and PDA. On PDA mycelium was abundant that initially was white, but becomes brown with age.

The isolates were identified by microscopic observation of their morphological characteristics. The spore mass was pale orange to dark brown and annular zonations often developed in response to a light-dark cycle. The isolates formed a pale brown to dark brown pigment where the colony contacts the agar. Dark brown spots or flecks of pigment were usually formed in the agar. The macroconidia were long to very long (54.2 - 60.1 μm) and slender, with pronounced dorsiventral curvature. The apical cell was tapered and elongated or even whip-like. The basal cell was foot shaped that may be elongated in appearance. Macroconidia were most 5- to 7-septate, usually abundant in sporodochia. Oval or slightly curved microconidia with 1-2 septa and size 9.2 - 17.2 μm were formed in aerial mycelium. Sporodochia were orange colored on OA or PDA media and formed in a central spore mass but may have not been obvious since being obscured by the mycelium.

After two weeks of cultivation chlamydospores were abundant in aerial hyphae and hyphae in the agar, found either singly, in chains or in clumps. A brown pigment and thick walls appear with time (Marasas et al., 1983; Leslie and Summerell, 2006).

Pathogenicity of each of these isolates was tested twice – in Petri plates and vegetation pots. Five wheat seeds of variety Laska-5, pre-washed with sterile water were placed in each Petri plate. Initially plates were incubated at 25-26°C for 3 days. After germination of the seeds each plate was inoculated placing five agar blocks 4 mm in diameter, cutted from the growing edge of a pure culture of the tested isolates developed on OA. For each isolate were used four replications. Another four Petry plates prepared in the same way, but without pathogen were used for uninoculated control. For 10 days it was monitored plant growth in each dish. Examination of the infected plants revealed brown necrotic lesions of roots and lower stams.

Pathogenicity of all *F. equisety* isolates was also tested in vegetation pots with inoculated soil. The isolates were cultured for 7 days at 25-26 °C in Petri plates on OA. When cultures filled plates, content of each plate was mixed with 1 L of sterilized

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soil in individual pots. In each pot were planted 10 wheat seeds of variety Laska-5. For each isolate were used four pots of 1 liter (replicates). We used for control 4 plates prepared identically, but without pathogen. Development of symptoms on the inoculated wheat plants was tracked for two-month period. At the end of the experiment we found symptomatic plants in each inoculated pot. Symptoms are expressed as slight to moderate root rot.

The inoculated pathogens were consistently reisolated from symptomatic tissues, thereby fulfilling Koch's postulates. None of the control plants developed symptoms of disease.

F. equiseti is widespread in diverse climatic regions such as Northern and Southern Europe (Marin et al., 2014). Various authors have reported *F. equiseti* as a fungal pathogen on small grain cereal crops, including wheat, barley, rye, oat, etc. (Manka et al., 1985). In Bulgaria *F. equiseti* has been reported to cause head blight of wheat in fields near Chirpan and Stara Zagora (Beev et al, 2011). To the best of our knowledge, this is the first report of *F. equiseti* as a pathogen on root and lower stem plant parts of wheat and rye in Bulgaria.

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