



First report of *Diplodia seriata* causing canker and dieback on hawthorn trees in Turkey

Şener Kurt^{1,2} · Aysun Uysal² · Emine Mine Soylu^{1,2} · Merve Kara¹ · Soner Soylu¹

Received: 1 December 2021 / Accepted: 16 June 2022 / Published online: 10 October 2022
© The Author(s) under exclusive licence to Società Italiana di Patologia Vegetale (S.I.Pa.V.) 2022

Keywords Botryosphaeriaceae · Hawthorn · *Crataegus* · *Diplodia seriata* · Dieback

During 2019–2020 growing season, stem canker and dieback symptoms were observed in up to 60% of 5–8 year old hawthorn (*Crataegus azarolus* L.) trees in Mersin province, Turkey. Symptoms appeared as wilting and discoloration of leaves, canker, gummosis, and dieback on stems and branches. The cross-section of symptomatic branches and twigs showed hard brown and V-shaped canker in the wood. Isolation made from surface-sterilized hawthorn twigs ($n=12$) on potato dextrose agar (PDA) yielded white or grey-to-dark brown fungal colonies ($n=8$) with aerial mycelium and dark pycnidia. Mature conidia were aseptate, ovoid with truncated or rounded base and obtuse apex, and $21.6\text{--}25.4 \times 7.5\text{--}9.8 \mu\text{m}$ in size ($n=60$). These morphological features agreed with those of *Diplodia seriata* De Not. (Phillips et al. 2007). The internal transcribed spacer (ITS) region, β -tubulin (TUB2) and TEF1- α (*tef*) genes of the representative isolate (HDs33) were amplified using the primers ITS4/ITS5, Bt2a/Bt2b, and EF1-728F/EF1-986R, respectively (Urbez-Torres et al. 2008), and sequenced (Accession Nos. OL351614 for ITS, OL362020 for TUB2, and OL362021 for *tef*). BLASTn search of the sequences revealed 100% homology with *Diplodia seriata* in the NCBI database (MK817042 for ITS, MN318125 for TUB2, and MT120836 for *tef*). The pathogenicity test was carried out on branches of 4-year-old young hawthorn saplings by inoculating mycelial plugs (5 mm in diameter) cut from a 7-day-old fungal culture into bark wounds on branches of hawthorn saplings ($n=15$) in a greenhouse at 30 °C. Plants treated with sterile agar plugs served as control.

After 12 weeks, seven of the fifteen inoculated plants produced canker lesions 24 to 39 mm in length. Control plants remained asymptomatic. The pathogen was consistently reisolated, thus fulfilling Koch's postulates. *D. seriata* has previously been reported to cause canker on *Crataegus* spp. in Canada, Australia, Bulgaria and the United Kingdom (Farr and Rossman 2021). To our knowledge, this is the first report describing *D. seriata* causing canker and dieback of hawthorn in Turkey.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s42161-022-01169-0>.

Data availability Data used in this manuscript will be available from the corresponding author with a reasonable request.

Declarations

Ethical approval This study does not contain studies with human participants or animals performed by any of the authors.

Conflict of interest The authors declare no conflicts of interest.

References

- Farr DF, Rossman AY (2021) Fungal Databases, U.S. National Fungus Collections, ARS, USDA. <https://nt.ars-grin.gov/fungaldatabases/>. Accessed 01 Dec 2021
- Phillips AJL, Crous PW, Alves A (2007) *Diplodia seriata*, the anamorph of “*Botryosphaeria*” *obtuse*. Fungal Divers 25:141–155
- Úrbez-Torres JR, Leavitt GM, Guerrero JC, Guevara J, Gubler WD (2008) Identification and pathogenicity of *Lasiodiplodia theobromae* and *Diplodia seriata*, the causal agents of bot canker disease of grapevines in Mexico. Plant Dis 92:519–529. <https://doi.org/10.1094/PDIS-92-4-0519>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

✉ Şener Kurt
senerk31040@gmail.com

¹ Department of Plant Protection, Faculty of Agriculture, Hatay Mustafa Kemal University, Antakya, Hatay 31034, Turkey

² Centre for Implementation and Research of Plant Health Clinic, Hatay Mustafa Kemal University, Antakya, Hatay 31034, Turkey