

Disease Note

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Stemphylium* Leaf Blight of Onion (*Allium cepa*) Caused by *Stemphylium vesicarium* in Italy

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In July 2019, severe leaf symptoms were observed on onion plants (*Allium cepa* L. cv. Dorata di Parma) in a commercial field located in the municipality of Medicina (Bologna, Emilia-Romagna region) in northern Italy. Diseased leaves showed yellowish to pale-brown and oval-shaped lesions, which later coalesced into larger necrotic areas and black leaf tips. As the disease progressed, conidia developed on the necrotizing leaves, causing premature desiccation of the whole plant. The disease incidence of approximately 70% was calculated in the affected field, together with yield losses that were estimated to be above 30%. Symptomatic tissue fragments excised from the leaf lesions were surface disinfected with 1% NaOCl for 2 min, rinsed with sterile water, and transferred onto potato dextrose agar (PDA). Fungi were consistently isolated after 5 days of incubation at 27 ± 1°C in the dark. Single-spore isolation was performed on PDA to obtain seven pure cultures, whose morphological characteristics were consistent with the description of *Stemphylium vesicarium* (Ellis 1971). DNA from a representative single-spore isolate was extracted, and the internal transcribed spacer region (ITS) of ribosomal DNA was amplified using the universal primers P-ITS1 and P-ITS4 (White et al. 1990). The PCR product was sequenced and deposited in GenBank (accession no. OP144057). A BLAST search in the CBS-KNAW collection bank (Westerdijk Fungal Biodiversity Institute, Utrecht, the Netherlands) showed 100% identity for the ITS gene with the strain of *S. vesicarium* under accession number CBS 124749. Moreover, the PCR assay using the primer pair KES 1999 and KES 2000

(Graf et al. 2016) for the *cytochrome b* gene displayed the specific fragments of 420 bp for *S. vesicarium*. The isolate was tested for pathogenicity on onion (potted plants cv. Texas Early Grano, fourth leaf stage) by spraying 4 ml of a conidial suspension (1 × 10⁴ conidia/ml) per plant. Inoculated and noninoculated plants (sprayed with sterile distilled water) were kept at 24 ± 1°C and 90% relative humidity with a 16-h photoperiod. Seven days after inoculation, disease assessment was performed. Inoculated plants showed typical *Stemphylium* leaf blight (SLB) symptoms, similar to those observed in the field. No symptoms developed on the water-inoculated plants. *S. vesicarium* was consistently reisolated from the artificially inoculated onion plants and identified using a PCR assay, according to Graf et al. (2016). The assay was repeated twice with the same results. SLB is currently reported worldwide, and it is considered a re-emerging threat and a truly challenging fungal disease, which can result in yield and quality losses of up to 90% in onion crops (Hay et al. 2021). In Italy, *S. vesicarium* has been reported several years ago on pear (Ponti et al. 1982) and, more recently, on radish sprouts (Belisario et al. 2008), chili pepper (Vitale et al. 2017), and spinach (Gilardi et al. 2022). To our knowledge, this is the first report of *S. vesicarium* on onion in Italy. Our results stress that development and implementation of innovative integrated pest management strategies are urgently needed to ensure effective control of SLB since only a few moderately resistant onion varieties are available (Hay et al. 2021) and no fungicides are currently registered to specifically control SLB in Italy. Further studies are underway to elucidate the pathogen's geographic distribution and assess the impact of this disease on the onion crop in Italy.

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