

DISEASE NOTES



First Report of Powdery Mildew Caused by *Erysiphe quercicola* on Curly Dock (*Rumex crispus*) in Brazil

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Curly dock or yellow dock (*Rumex crispus*) is a perennial flowering plant in the Polygonaceae family that is used medicinally and for cooking. It is also an important weed in white clover (*Trifolium repens*) seed production fields in southern Brazil. During the spring and summer of 2017, in the municipality of Bagé, Rio Grande do Sul, Brazil, powdery mildew was observed on curly dock plants grown in the greenhouse. The disease incidence reached 100%, and its severity ranged from 40 to 80%. Disease symptoms included yellowing of the leaves, reduced growth, and white to gray rounded irregular lesions distributed on leaves (adaxial and abaxial sides), flower stalks, and calyx. Severely infected leaves were completely covered by signs of the pathogen, and floral organs prematurely died. Mycelia were superficial with well-developed lobed appressoria and erect conidiophores producing conidia singly. Conidiophores ($n = 30$) were unbranched, cylindrical, 80 to 115 μm long (mean 93 μm), composed of a cylindrical foot cell 28 to 39 μm long (mean 32 μm), 4 to 8 μm wide (mean 6 μm), followed by one to two shorter cells. Conidia ($n = 100$) were ellipsoid-ovoid to subcylindrical, 34 to 51 μm long (mean 41 μm), and 12 to 17 μm wide (mean 14 μm), rugose outer wall when turgid, and without fibrosin bodies. Germ tubes were produced apically and ended in a lobed appressorium. Chasmothecia were not formed on sampled plants. The teleomorph of this species is only known to occur on *Quercus* sp. hosts (Braun and Cook 2012). DNA was extracted from conidia, conidiophores, and mycelium and used to amplify the internal transcribed spacer (ITS; ITS1-5.8s-ITS2) using the ITS1-KYO2 and ITS4 primers, the partial 28S rDNA using the NL1 and NLP2 primers, and the NAPRTase (putative nicotinate phosphoribosyltransferase) using the MS294a and MS294cR primers (Braun and Cook 2012; Toju et al. 2012). Obtained sequences were submitted

References:

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to GenBank under accession numbers MH304757, MH305358, and MH319696 for ITS, partial 28S rDNA, and NAPRTase, respectively. BLAST search revealed 99 to 100% identity with *Erysiphe quercicola* S. Takam. & U. Braun from tropical trees and fruits (accessions KM260692 and KM260678) and *Mangifera indica* (accession KY466668). To fulfill Koch's postulates, leaves of five healthy plants in their flowering stage were inoculated on the adaxial side by transferring conidia from symptomatic plants using an eyelash brush. Five noninoculated plants served as controls. Inoculated and control plants were maintained in separate compartments in a greenhouse with relative humidity around 80% and temperature ranging from 20 to 30°C. Powdery mildew symptoms, characterized as irregular, sparse, white-gray lesions, similar to those on symptomatic plants, were observed 8 to 10 days after inoculation. The control plants remained asymptomatic. Powdery mildew on *R. crispus* was previously reported in several countries with the causal agents *E. heraclei*, *E. communis*, and *E. polygoni* (Farr and Rossman 2017; Lee 2013). In Brazil, morphological (Braun and Cook 2012) and molecular data indicated that *E. quercicola* is the causal agent of powdery mildew on *R. crispus*. *E. quercicola* is known to infect tree species (Farr and Rossman 2017), yet in this report it was shown to infect *R. crispus*. This is the first report of powdery mildew caused by *E. quercicola* on *R. crispus*. This report reveals that the host range of *E. quercicola* is wider than originally reported, and curly dock is a potential inoculum source for cultivated trees in Brazil.

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