



First report of leaf rust caused by *Coleosporium solidaginis* on *Liatris pycnostachya* (prairie blazing star)

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In November 2017, several individuals of prairie blazing star (*Liatris pycnostachya*; Fig. 1) were observed with symptoms of leaf rust and severe defoliation in La Marque, Texas (GPS coordinates 29°23'30.8"N 95°02'21.6"W). Symptoms were distributed across multiple leaf surfaces with no clear correlation with leaf age. The abaxial leaf surface had circular to angular spots surrounded by brown necrotic tissue (Fig. 2), and the adaxial leaf surface had bright yellow-orange rust pustules (uredinia) that were erumpent and 200 to 500 µm in diameter. Urediniospores were broadly obovoid, amber in colour, and ovate (30-35 µm long × 15-25 µm wide; $n = 40$) with echinulate spore walls 1.3-1.5 µm thick (Figs. 3-4).

Based on host information, the pathogen was identified as a *Coleosporium* species and based on morphology it was identified as *C. solidaginis*. As rust fungi cannot be cultured, Koch's postulates cannot be tested, so we proceeded with molecular methods of identification. DNA was extracted from urediniospores of two samples, and two separate nested PCR reactions were performed. The 28S gene region of rDNA was initially amplified with Rust2inv (Aime, 2006) & LR6 (Vilgalys & Hester, 1990), and an additional PCR was conducted using the Rust28SF primers (Moranz *et al.*, 2014) & LR5 (Vilgalys & Hester, 1990). PCR products were sequenced with primers Rust28SF and LR5 and the sequenced region shared 99-100% identity with a number of *C. solidaginis* isolates (e.g. BPI 877830, Sevier Co., USA; GenBank Accession No. MF769692; McTaggart & Aime, 2018). The sequences generated in this study were deposited in GenBank (MN334696 and MN334697).

Liatris pycnostachya is an ecologically and economically important species. It is common in remnants of the threatened coastal tallgrass prairie and is a nectar source for grassland-obligate butterflies (Moranz *et al.*, 2014). It is also grown commercially for ornamental arrangements and landscaping. The more common hosts of *C. solidaginis*, *Solidago* spp., are common

prairie forbs, but have not been found hosting *C. solidaginis* at this site. To our knowledge, *C. solidaginis* has never been reported on *L. pycnostachya*. The presence of *C. solidaginis* on *L. pycnostachya* at this site is of particular concern given that (i) urediniospores disperse long distances by wind, (ii) its appearance on *L. pycnostachya* suggests that *C. solidaginis* now has another host, which may increase its spread, (iii) the spread of *C. solidaginis* in Texas prairies could harm important plant resources in an already threatened ecosystem, and (iv) host expansion of the rust may negatively affect commercial ornamental production of *L. pycnostachya*.

Acknowledgements

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Figure 1

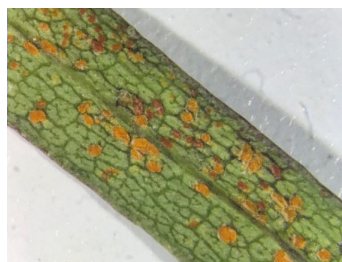


Figure 2

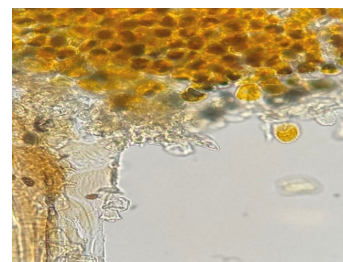


Figure 3



Figure 4

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