New Disease Reports

First record of *Alternaria thunbergiae* on *Thunbergia alata* in Europe

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Thunbergia alata, often known as black-eyed Susan vine, is used in UK gardens as an annual climber in bedding schemes and hanging baskets. Flowers are typically shades of yellow, orange and red with a black centre. Plants germinated onsite from commercial seed were observed with dark leaf spots in outdoor beds at RHS Wisley in July 2017. Initial symptoms were dark circular spots surrounded by a yellow halo. These developed into circular necrotic lesions with a small white, central spot (Figs. 1-2). Lesions coalesced to produce early leaf necrosis but plants continued to flower profusely through to the end of the season.

Microscopic inspection of leaf lesions revealed brown conidia with extremely long beaks on unbranched conidiophores, developing on the necrotic tissues (Figs. 3-4). Mature conidia had ellipsoid or obclavate bodies, (79-) 85-108 (-117) × (15-) 17-29 (-31) µm with 8-9 (-11) primary transverse septa and (2-) 5-6 (-8) euseptate cells. Beaks were (150-) 185-310 (-350) µm in length, tapering from a base (3.6-) 4.1-7.0 (-7.3) µm in diameter. These features identify the casual fungus as *Alternaria thunbergiae* described by Simmons & Alcorn (2007) from leaf spots on *Thunbergia alata* collected in Queensland, Australia. Although 90% of the conidia were narrower than the original description of *A. thunbergiae* (27-32 µm), 98% were broader than *A. iranica* (17-20 µm, Simmons & Ghosta, 2007) which was placed in synonymy with *A. thunbergiae* by Woudenberg *et al*. (2014) using a five-gene phylogenetic analysis.

A single-spore isolate was obtained on potato dextrose agar and deposited in the RHS culture collection held at RHS Wisley (RHS400616) and at the Westerdijk Fungal Biodiversity Institute, Netherlands (CBS145627). The internal transcribed spacer (ITS) region of rDNA and the glyceraldehyde-3-phosphate (GAPDH) gene were amplified and sequenced (GenBank Accession Nos. MK295816 and MK307897, respectively). The ITS sequence was identical to two ITS sequences for *A. thunbergiae* already held in GenBank (KJ718257 and KJ718258) and differed from a third available sequence (KJ718259) by one base pair. The GAPDH sequence was identical to all three GAPDH sequences for *A. thunbergiae* available in GenBank (KJ718084, KJ718085 and KJ718086).

To confirm pathogenicity, damp filter paper discs on which the fungus was sporulating, were placed on the leaves of young *Thunbergia alata* plants kept at ambient temperature in natural light conditions. Discs were removed after a 48-hour period in which the plants were kept at 100% humidity. Pale, necrotic lesions developed after two weeks. Spores typical of *A. thunbergiae* were found on the lower leaf surface of lesions, isolated and confirmed as *A. thunbergiae* using ITS and GAPDH sequences. Control plants, on which damp sterile filter paper discs were placed, showed no symptoms.

In addition to Australia, *A. thunbergiae* has been reported from Florida, USA (Leahy, 1992), from Rio de Janeiro, Brazil (Melo, 2009) and from Miandoab, Iran on *Allium cepa* as *A. iranica* (Simmons & Ghosta, 2007). To our knowledge, this is the first record of *A. thunbergiae* in the United Kingdom and Europe. Whilst the infected mature plants continued to flower well at RHS Wisley, the unsightly foliage caused a reduction in plant quality. These symptoms could have significant negative implications for growers producing planting material. A pressed specimen of *Thunbergia alata* showing typical symptoms has been deposited at the Royal Botanic Gardens, Kew as K(M)257596.

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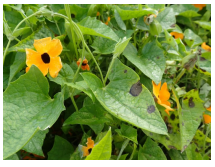

Figure 1

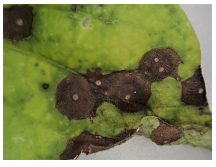

Figure 2

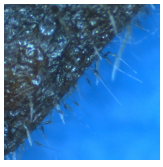

Figure 3

Figure 4

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