New Disease Reports

First report of *Ilyonectria* sp. affecting foliage of *Tulipa*

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Tulips are an important commercial plant as both cut flowers and garden plants. During 2013, several tulip plants were observed in Surrey U.K. with scarring of the leaf tissue resulting in growth distortion and curving/curling of the leaves (Fig. 1). Scarred areas were usually at the leaf edges and growth caused cracking. Infected areas subsequently developed into necrotic patches.

Conidiophores with *Cylindrocarpon*-like conidia were produced on the leaves following incubation. Conidiophores were simple, arising laterally or terminally, solitary produced and unbranched. Both macroconidia and microconidia were observed. Macroconidia were 1-3 septate (predominantly 1 septate, more than 80%), straight, cylindrical, narrowing towards the tip. The 1-septate macroconidia measured 16.6-28.1 x 2.6-3.8 µm (22.4 x 3.3 µm) with a length/width ratio of 5.1-8.5 (6.8); the 2-septate macroconidia measured 25.3-28.4 x 3.1-3.6 µm (26.8 x 3.5 µm) with a length/width ratio of 7.1-8.8 (7.7); and the 3-septate macroconidia measured 27.0-30.1 x 3.5-4.2 um (28.7 x 3.6 µm) with a length/width ratio of 7.0-8.7 (7.9) (Fig. 2). Microconidia were predominantly aseptate (occasionally 1-septate), ellipsoidal to subcylindrical, straight, measuring 6.7-17.5 x 1.9-3.4 µm (11.1 x 2.6 µm) with a length/width ratio of 3.1-5.5 (4.2) (Fig. 2). Smooth, thick-walled chlamydospores, abundantly present in infected plant tissue, were globose to cylindrical, measuring 11-14 x 9-12 µm, terminal on lateral branches, singularly or in chains or clumps, and pale brown colour (Fig. 3).

A single conidial culture was isolated and the ITS and β-tubulin regions were sequenced (GenBank Accession Nos. KJ475469 and KJ513266, respectively) according to Cabral *et al.* (2012). Both sequences matched 100% with *Ilyonectria crassa* (JF735275.1 and JF735394.1, respectively). Morphological characteristics also matched those for *I. crassa* (Cabral *et al.*, 2012), except the width of the macroconidia and microconidia were slightly narrower, leading to the 1- and 2-septate macroconidia having greater length/width ratios. Cabral *et al.* (2012) also analysed a strain that clustered with *I. crassa* for most genes, but did not include it in this species because of its differing length/width ratio. For this reason, we identified our isolate as *Ilyonectria* sp. until further taxonomic clarifications can be made.

To demonstrate pathogenicity, a conidial suspension (9.0 x10^5 conidia/ml) in sterile water was prepared by scraping the surface of a culture grown on potato dextrose agar for 21 days and then sprayed onto *Tulipa humilis* 'Little Beauty' foliage until run-off. Inoculated and non-inoculated (sterile water only) plants were bagged to increase humidity and kept at 20-25˚C, excluding light for 24 hours, then subsequently exposed to natural daylight. After 10 days, scarring was observed on the inoculated plants only and successful re-isolation of the fungus was confirmed by morphology. The inoculated plants were examined and the outer scales of the bulbs were found to have many chlamydospores present within the tissue. Currently, *I. crassa* (basionym *Cylindrocarpon radicicola* var. *crassum*) is recorded only as a root rot pathogen on *Lilium* sp. and *Narcissus* sp. from the Netherlands and *Panax quinquefolium* from Canada (Farr & Rossman, 2014). This is the first record of an *Ilyonectria* species causing foliar symptoms and the first case recorded on *Tulipa*.

References

Cabral A, Groenewald JZ, Rego C, Oliveira H, Crous PW, 2012. Cylindrocarpon root rot: multi-gene analysis reveals novel species within the *Ilyonectria radicicola* species complex. *Mycological Progress* **11**, 655-688. http://dx.doi.org/10.1007/s11557-011-0777-7

Farr DF, Rossman AY, 2014. Fungal Databases, Systematic Mycology and Microbiology Laboratory, ARS, USDA. Retrieved March 03, 2014, from http://nt.ars-grin.gov/fungaldatabases/.

Figure 1

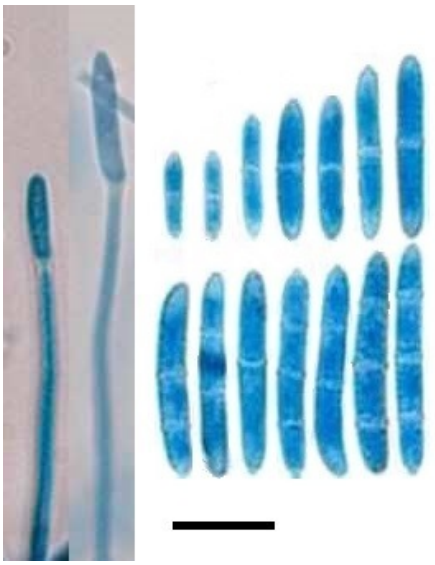

Figure 2

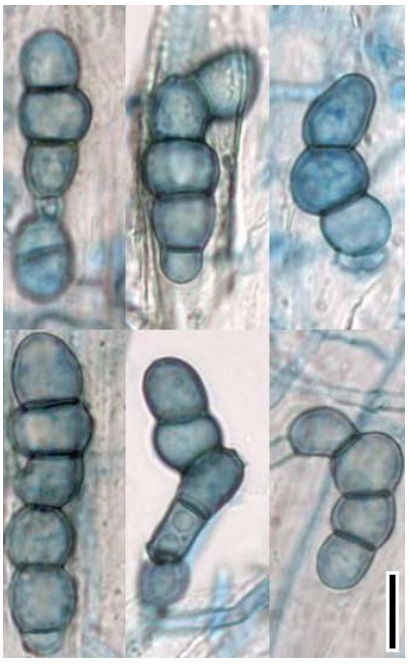

Figure 3

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