

NEW DISEASE REPORT

First report of *Querciphoma minuta* causing branch and stem canker in *Platanus × hispanica* in Germany

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The London plane tree (*Platanus × hispanica*) is a long-lived drought tolerant tree, able to adapt to urban conditions and tolerate pollution, which is often grown as a park and avenue tree in Central Europe. In July and August 2022, branches from 20-year-old plane trees with large, dark-brown to red-brown lesions (Figure 1) extending from the

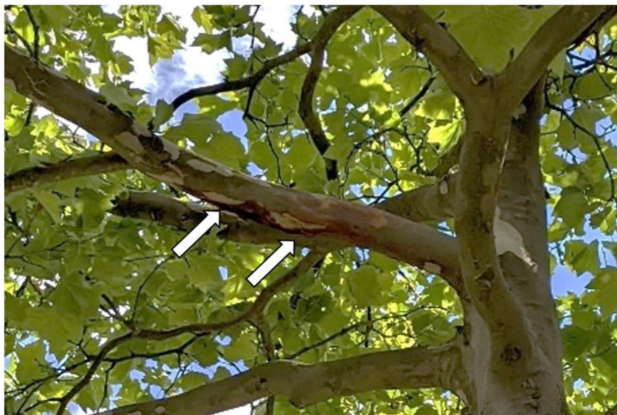


FIGURE 1 Branch canker on a naturally infected plane tree in July 2022 in Cottbus, Germany

bark (Figure 2a-b) to the heartwood (Figure 2c-d) were observed along an avenue in Cottbus, Germany. More than 100 trees (about 60% of the total) were diseased. Trees on the eastern side of the road, which were more exposed to sunlight, were significantly more affected than those

on the west side, where sunlight exposure was reduced by larger trees in an adjacent park.

Infected branches of different sizes (diameter 3–10 cm) were collected from four individual plane trees, with five samples being taken from each tree. From each branch, nine diseased samples were taken from the sapwood and heartwood, surface-sterilised and incubated on synthetic nutrient-poor agar (Sifin Diagnostics GmbH, Germany) for six days at $24 \pm 2^\circ\text{C}$ under daylight conditions. Based on morphological characteristics, described in Crous and Groenewald (2017), *Querciphoma minuta* (syn. *Q. carteri*), a species within the *Camarosporium* complex was identified from all the samples. Conidiomata were medium brown, pycnidia, globose to eustomatic with 1–3 papillate ostioles, 150–250 μm diameter (Figure 3a), with verruculose, septate setae with obtuse ends (Figure 3b-d). Conidia were solitary, hyaline, smooth, broadly ellipsoidal, aseptate and $4\text{--}6 \times 3,5 \mu\text{m}$ in size. To confirm the identification, genomic DNA was extracted from four isolates and the internal transcribed spacer (ITS) region of rDNA was amplified using the ITS1/ITS4 primers (White *et al.*, 1990). All consensus sequences (GenBank Accession Nos. OQ186736, OQ186741, OQ190053 and OQ190054) were identical. BLAST searches revealed 100 % sequence identity to *Querciphoma minuta* (KX359604.1, KF251209.1 and MN833930.1).

A pathogenicity test was performed using two isolates (22-784B, 22-1121) on twenty healthy plane tree seedlings (*Platanus × hispanica*), 120 to 150 cm in height. Wounded stems were inoculated with mycelial plugs taken from the margin of a seven-day colony growing

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FIGURE 2 External and internal, dark brown to red-brown lesions on branches of naturally infected plane trees in July and August 2022 in Cottbus, Germany

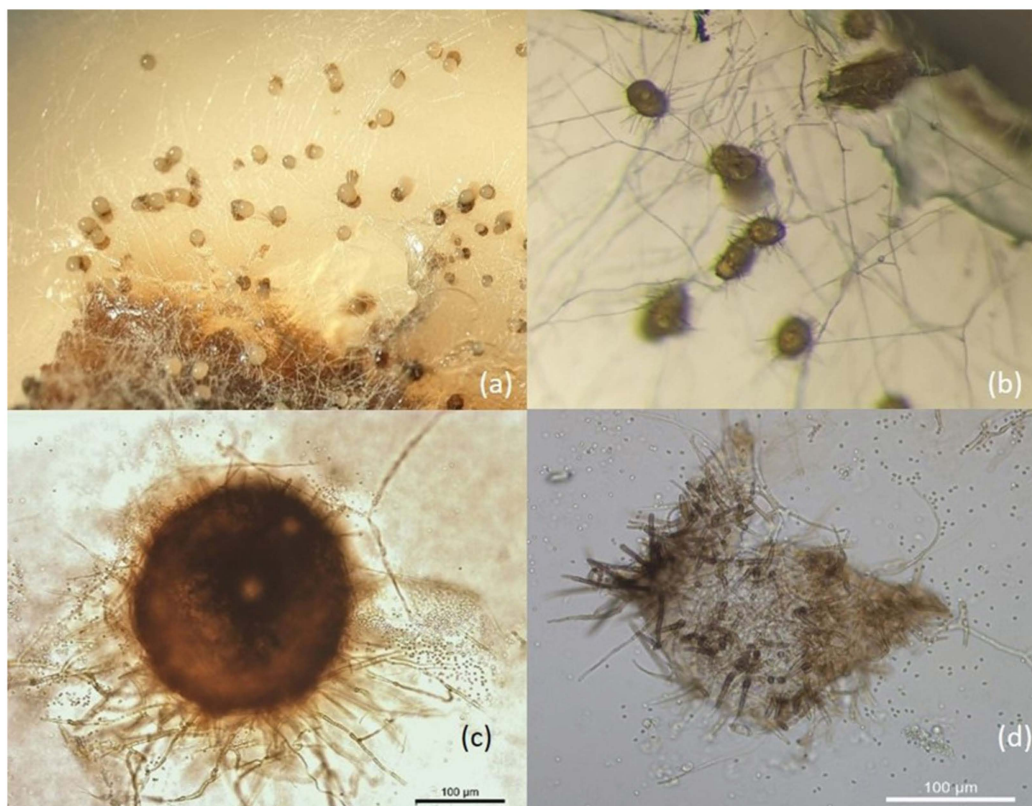


FIGURE 3 *Querciphoma minuta*: (a) conidiomata on synthetic nutrient-poor agar; (b) conidiomata with setae; and (c-d) conidiomata with setae and conidia

on potato dextrose agar (PDA) (sterile PDA agar plugs were used as controls) and sealed with plastic film. After six weeks of incubation at $24^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 75% humidity in the greenhouse, necrosis and vascular discoloration appeared on almost 98% of the sites inoculated with mycelium (Figures 4a-b and 5a-c), but not on the sites inoculated with sterile agar plugs (Figures 4c-d and Figure 5d). Necrosis extended mainly longitudinally from the inoculation point, causing brown to dark brown discoloration of the wood (Figure 3j). Lesions varied considerably, ranging from 1 to 5.3 cm in length for both isolates. Fungi were

reisolated from all stem lesions and identified as above. *Querciphoma minuta* was confirmed in 85% of the inoculated sites, but in none of the controls, thus fulfilling Koch's postulates.

Querciphoma minuta was until now known only to occur in oak, causing dieback (Carter 1941), or associated with veteranisation wounds in living oak trunks (Menkis et al., 2022). It is also pathogenic when associated with *Coraeus florentinus* in declining oak forests (Pinna et al., 2019). In 2022, *Q. minuta* was also found in *Quercus petraea* displaying dieback and large stem lesions in Spremberg, Germany (LELF,





FIGURE 4 Pathogenicity test of *Querciphoma minuta* on plane seedlings (*Platanus × hispanica*). Wounded stems were inoculated with mycelium plugs and sterile agar was used as a control. Inoculation point with *Q. minuta* after 1 and 6 weeks respectively, enlarged and tending to sink with slight swelling of the healthy tissues around the necrosis (a-b). Inoculation point of control after 1 and 6 weeks respectively, partially to completely closed (c-d).



FIGURE 5 Lesions beneath the bark around the inoculation point of *Querciphoma minuta* (a-c). Negative control, wound response (d) six weeks after inoculation.

unpublished). Nevertheless, much remains to be discovered about the ecology of this fungus. This is the first report of *Q. minuta* as a potential canker pathogen of plane, suggesting that the pathogen has a larger host range of and a greater impact as a plant pathogen than previously suspected.

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