



## NEW DISEASE REPORT

# First report of *Lecanosticta acicola* causing brown spot needle blight on Atlas cedar in France

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## KEYWORDS

*Cedrus atlantica*, fungal plant disease, *Lecanosticta acicola*

*Lecanosticta acicola*, the causal agent of brown spot needle blight, has been responsible for severe damage on pines in North and Central America, Asia, and since the 1990s, in Europe (van der Nest *et al.*, 2019). In France it has been described on various pine species since 1993 (Chandelier *et al.*, 1994; Rapet & Chauvel, 1994), mainly in south-western regions. In 2018, *L. acicola* was detected for the first time on a non-pine host in an arboretum in Turkey on a Lebanon cedar (*Cedrus libani*) showing needle blight symptoms (Oskay *et al.*, 2020). Since 2019 it has been considered a regulated non-quarantine pest in the European Union.

In spring 2020, light to severe defoliation and severe reddening of the attached needles, starting from the lower parts of the tree, were observed on twigs of adult Atlas cedar (*Cedrus atlantica*) planted in 1998 in a forest in the Tarn-et-Garonne department (south-west France). About 50% of the cedar trees in the plot showed these symptoms (Figure 1) but no mortality was seen. Samples were collected and analysed in December 2020. Needles with brown spots and necroses (Figures 2–3) were incubated at room temperature in a moist chamber. After seven days incubation, black conidiomata developed. Olivaceous brown verruculose conidia were observed (Figure 4). They were cylindrical with a truncate base and a rounded apex, mainly curved and three-celled,  $35\text{--}50 \times 5\text{--}6 \mu\text{m}$ , similar to that reported by Oskay *et al.* (2020). The fungus was identified as *Lecanosticta acicola* based

on its morphological features. *Lecanosticta acicola* was isolated from conidiomata on malt extract + 100 ppm chloramphenicol agar medium, total DNA was extracted from the obtained culture and the ITS region was amplified by PCR using the ITS5/ITS4 primers (White *et al.*, 1990). The amplicon was sequenced (GenBank Accession No. OM517169.1) and BLAST analysis showed 100% identity with a *L. acicola* reference sequence, NR\_120239.1 (CBS 133791 – ITS region). In parallel, total DNA was extracted from symptomatic needle pieces and the presence of *L. acicola* was confirmed by a specific real-time PCR assay using the *L. acicola*-specific primer/probe combination Latef-F1/-R1/-P1 (loos *et al.*, 2010).

This is the first report of *Lecanosticta acicola* affecting *Cedrus atlantica* globally and the first report of a non-pine host species in France and in the European Union. In autumn 2021, *L. acicola* was detected again on Atlas cedar, in a few 15- to 20-year-old forest trees showing similar symptoms in the Dordogne and Gers departments (south-west France). *Pinus* spp. (including *Pinus nigra* subsp. *laricio*) are widely present in the regions concerned, brown spot needle blight has not been identified despite intensive inspection of trees in this genus close to the affected cedars. Research is in progress to learn more about the origin of this outbreak and a survey has started targeting *L. acicola* and cedars more generally, in south-west France to provide more information on the disease. The multiple detections in different

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**FIGURE 1** Atlas cedars showing symptoms of defoliation and reddening of the needles



**FIGURE 2** Shoot with needles showing brown spots

areas may suggest that it is now established on Atlas cedar, a species which is being planted in southern France in response to climate change. The susceptibility of *Cedrus* spp. and other conifers to brown spot needle blight and the threat that *L. acicola* represents on non-pine hosts in the natural environment are of major concern.



**FIGURE 3** Affected needles with brown spots



**FIGURE 4** Conidia of *Lecanosticta acicola*

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