

NEW DISEASE REPORT**First report of *Sirococcus tsugae* on Atlas cedar in Switzerland****S. Stroheker¹** | **B. Ruffner²** | **L. Beenken¹**¹Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Swiss Forest Protection, Zürcherstrasse 111, 8903, Birmensdorf, Switzerland²Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Phytopathology, Zürcherstrasse 111, 8903, Birmensdorf, Switzerland**Correspondence**

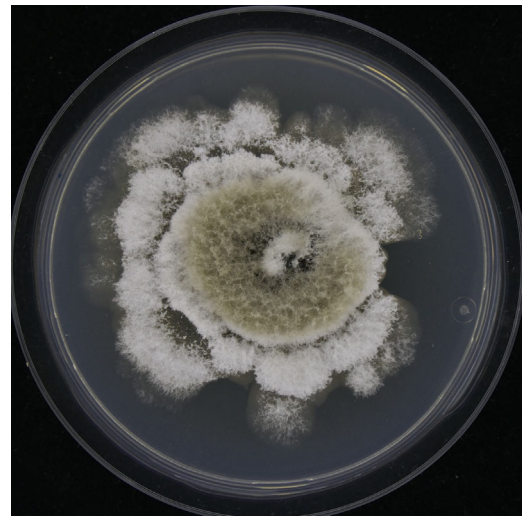
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Email: sophie.stroheker@wsl.ch**KEYWORDS***Cedrus atlantica*, needle discolouration

In August 2021, an Atlas cedar (*Cedrus atlantica*) with defoliation in the periphery of the crown, dead twigs of about two–three years of age with brown needles, and partly secondary resprouting spanning across the whole crown was observed in the canton of Lucerne, Switzerland. One branch showing severe disease symptoms was collected for fungal isolation. Ten needles were surface sterilised by immersion in 70% ethanol (v/v) for two minutes. Then, a small fragment, approximately 2–3 mm in length, was cut aseptically from each sterilised needle, placed on streptomycin-amended malt agar (15 g/l Diamalt (Difco, Basel, Switzerland), 20 g/l agar, 100 mg/l streptomycin), and incubated at room temperature (20°C) for two weeks. From each of the ten segments, mycelial growth occurred and mycelium was harvested for Sanger sequencing.

The internal transcribed spacer (ITS1–5.81–ITS2) of the ribosomal DNA was amplified and sequenced using primers ITS4 and ITS5 (White et al., 1990). Each consensus sequence was blasted against accessions on GenBank. BLAST searches assigned three isolates to *Sirococcus tsugae* with 99.8 and 100% identity to GenBank Accession Nos. AY163785 and OL875271, respectively. The next best match within the genus *Sirococcus* had 96.2% identity (*Sirococcus quercus*; NR_155858). All sequences were submitted to GenBank (OL875271–OL875273).

Young isolates of *S. tsugae* were cream-coloured to grey with a hint of olive and wavy margins (Figure 1). With increasing age of the cultures, dark conidiomata were formed at the margins (Figure 2). Conidiomata were spherical, brown to black, 230–380 μm in diameter (Figure 2). Conidia were two-celled, spindle-shaped, pointed at the ends, slightly constricted at the septum, 8.7–10.10–11.5×2.6–3.07–

**FIGURE 1** *Sirococcus tsugae* on streptomycin-amended malt agar

3.5 μm, length/width ratio 2.68–3.31–4.21, walls colourless, thin, cell contents hyaline with few droplets (Figure 3).

The fungal pathogen *Sirococcus tsugae* was, until 2014, only known to occur in North America but has since been reported from several countries in Europe including Belgium, Germany and the UK (Butin et al., 2015; Pérez-Sierra et al., 2015; Schmitz et al., 2018; European and Mediterranean Plant Protection Organization, 2019). In the early stages of infection, the needles go limp and begin to turn pale green. As

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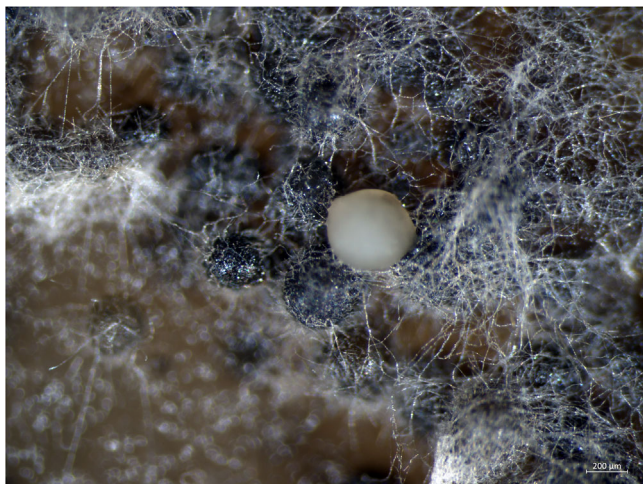


FIGURE 2 Conidiomata of *Sirococcus tsugae*

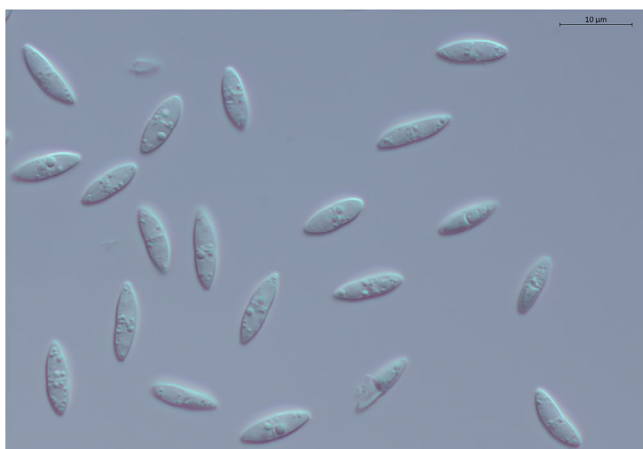


FIGURE 3 Conidia of *Sirococcus tsugae*

the disease progresses, the needles then turn brown and fall off. Additionally, infected shoots show necrotic lesions on the bark. The progressive dieback of branches and the crown can, over a period of time,

lead to the death of infected trees (Butin et al., 2015). To the best of our knowledge, this is the first finding of *Sirococcus tsugae* in Switzerland.

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CONFLICTS OF INTEREST

The authors have no conflict of interest to declare

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