



# Sirococcus blight (*Sirococcus tsugae*)



## Background

The fungus *Sirococcus tsugae*, originates from North America. It was first reported in 2013 the UK, where it is now present in England, Scotland, Wales and North Ireland. Also reported in Germany in 2014 and Belgium in 2018 [see distribution].

*S. tsugae* impacts species of the *Cedrus* and *Tsuga* genera (cedars and hemlocks respectively), including: the Atlas cedar (*Cedrus atlantica*), Deodar cedar (*C. deodara*), Western hemlock (*Tsuga heterophylla*), Mountain hemlock (*T. mertensiana*), and Eastern hemlock (*T. canadensis*). These are valuable ornamental and forestry species in the UK.

It is an asexually reproducing fungus, producing spherical fruiting structures where conidia (asexual spores) are developed. Primary infections occur mainly in spring and early summer, shortly after new shoot growth starts and when there is also a higher abundance of viable conidia. The fungus can survive in infected dead plant material, often residing in needles, stems and plant litter underneath affected trees.

## Symptoms

### *Cedrus* spp.

- Dead needles on the shoots, with a distinctive pink colour (Fig 1a, b) and becoming brown as the season progresses. Needles can also drop when infected (Fig 2).

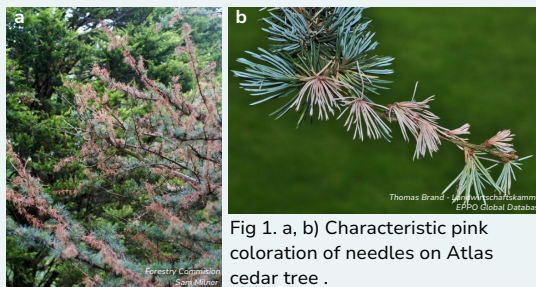


Fig 1. a, b) Characteristic pink coloration of needles on Atlas cedar tree.

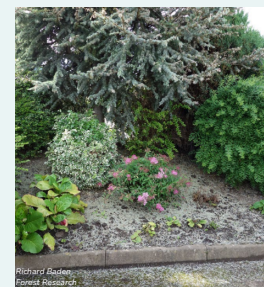


Fig 2. Extensive needles drop of an infected Atlas cedar.

- Canker in the bark of shoots and branches spreading longitudinally. Characterised by darker red/purple lesions or depression in the bark (Fig 3a). Resin bleeding is often associated with cankers (Fig 3b).



Fig 3. a) Canker in the bark of *Cedrus* sp. b) Profuse resin production associated with the canker.

- Fruiting bodies may appear in the surface of cankers (Fig 4a, b) and dead needles (Fig 4c), especially in winter.

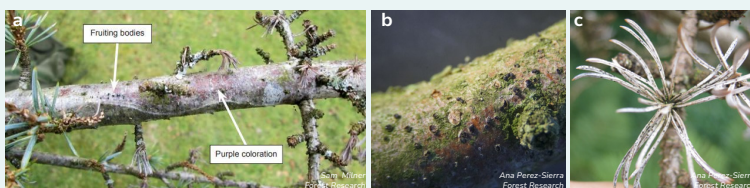


Fig 4. a, b) Purple bark canker with small black fruiting bodies of *S. tsugae*. c) Fruiting bodies on the dead needles of an infected cedar tree.

- Dieback of affected shoots can cause the shoots to have a bent over (Fig 5a, b), which occurs as the shoot dies back from the tip.



Fig 5. a, b) Wilting and bent over shoots of Atlas cedar tree.

### *Tsuga* spp.

- Defoliation and dieback on shoots tips (Fig 6 a, b).
- Fruiting bodies on the underside of leaves (Fig 7).



Fig 6. a, b) Dieback of shoot tips of Western hemlock.



Fig 7. Fruiting bodies of *S. tsugae* on Western hemlock leaves.