New Disease Reports

First report of *Phytophthora austrocedri* infecting Nootka cypress in Britain

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In early 2011, reports were received of foliage bronzing of Nootka cypress (*Callitropsis nootkatensis*) at a single location in the Glasgow area of Scotland. The affected tree, a mature specimen planted in a public park, had entirely bronzed foliage (Fig. 1) and an orange-brown coloured lesion in the phloem around the stem collar. Phloem samples from the lesion margins were plated onto a *Phytophthora*-selective medium (SMA + MRP; Brasier *et al*., 2005) and incubated in the dark at room temperature (15–24°C). Resulting colonies were very slow growing (<0.5 mm per day at 17°C) forming dense, white mycelia with coralloid hyphae on V8 agar. Based on colony morphology and sequencing of the ITS region, the isolate was identified as *Phytophthora austrocedri*, associated with widespread mortality of *Austrocedrus chilensis* in Patagonia (Greslebin *et al*., 2007; Greslebin & Hansen, 2010) and *Juniperus communis* in northern Britain (Green *et al*., 2012; Green *et al*., 2015). The ITS sequence of the isolate was deposited in Genbank (Accession no. JQ346530).

Excised shoots (approximately 30 cm long) of Nootka cypress were inoculated at their midpoint with mycelial plugs taken from the margins of three-week-old cultures of a single *P. austrocedri* isolate growing on V8 agar. The inoculation site was wrapped in damp sterile cotton wool secured in place with plastic paraffin film and aluminium foil. The ends of each shoot were also wrapped in damp sterile cotton wool and sealed with plastic paraffin film. Twenty shoots were inoculated with *P. austrocedri* and 20 shoots inoculated with sterile V8 agar as controls. The shoots were placed in sealed plastic bags containing a damp cotton wall ball and incubated at 16°C in the dark. Eight weeks after inoculation, orange-brown phloem lesions ranging from 12-90 mm in length (mean 52 mm ± 5 [SE]) had developed that extended to either side of the inoculation point (Fig. 2a). *Phytophthora austrocedri* was re-isolated from the lesion margins. Control shoots remained healthy (Fig. 2b).

This is the first finding of *P. austrocedri* infecting Nootka cypress. Two more declining Nootka cypress trees located in the same park have since been confirmed as infected with *P. austrocedri*. The pathogen is a statutory listed organism and the outbreak has been contained by destruction of affected trees. The most likely pathway of entry of *P. austrocedri* into Britain is via the plant trade since DNA of the pathogen has been found in diseased tissues of young *Juniperus* species, *Chamaecyparis lawsoniana* and *Cuppressocyparis leylandii* imported from other European Union countries (data from the Animal and Plant Health Agency, York, England and Science and Advice for Scottish Agriculture, Edinburgh, Scotland). *Phytophthora austrocedri* poses a clear risk to Nootka cypress in its native range of the Pacific Northwest of North America and phytosanitary efforts should be focused on preventing its establishment there.

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Figure 1

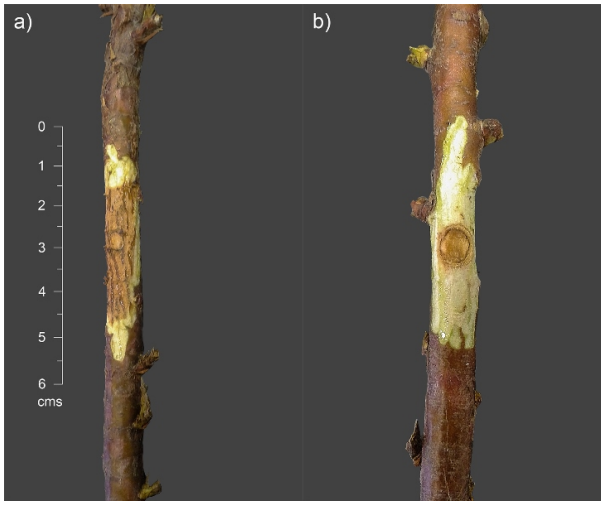

Figure 2

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