New Disease Reports

First report of *Rhizoctonia solani* AG2-1 on *Matthiola incana* in the United Kingdom

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Rhizoctonia solani is a species complex consisting of 13 different anastomosis groups (AGs) and numerous subgroups. Each AG or subgroup is usually associated with a particular host. In 2014, stock plants (*Matthiola incana*, Brassicaceae) displaying lesions on the stem were received by the Fera Plant Clinic for diagnosis. To determine the causal agent, plants were washed and symptom-bearing stems were excised and placed on potato dextrose agar (PDA) containing penicillin and streptomycin. Plates were incubated for three days until fungal colonies were visible. Colonies morphologically resembling *R. solani* were consistently present and a pure culture was obtained by transferring hyphal tips onto fresh PDA. DNA was extracted from a seven-day-old culture of the isolate as described previously (Woodhall *et al*., 2013). The rDNA ITS region was sequenced as described in Woodhall *et al*. (2007) and the resulting sequence (GenBank Accession No. KT345948) was 100% identical to other AG2-1 sequences present on GenBank (KF870926, AB547384).

Pathogenicity of the isolate was confirmed by inoculating 28-day-old *M. incanca* and *M. incana* 'Cinderella series' seedlings (12 each) grown in compost (John Innes No. 3) each with a 5 mm fully colonised PDA plug of the isolate placed at approximately 30 mm depth in the soil. Twelve plants of both varieties were inoculated with sterile PDA plugs for controls. Plants were placed in a controlled environment room at 18°C, 18h/6h light/dark and watered as required. After 28 days, plants were removed from the soil and assessed for the presence of lesions. Each plant was indexed for disease as follows: 0-healthy; 1-lesions smaller than 5mm; 2-lesion greater than 5 mm; 3-girdling from multiple large legions coalescing; or 4-complete plant death. No symptoms were observed on the non-inoculated plants of either *Matthiola* variety (Table 1). Stem lesions typically longer than 5-mm in length were observed on almost all inoculated plants (Figs. 1, 2). On average, stem disease severity was greater in the 'Cinderella series' but not significantly ($p > 0.05$). No symptoms were present on the roots.

From six inoculated plants of each variety, re-isolation of *R. solani* was attempted onto tap water agar plus penicillin and streptomycin. *Rhizoctonia solani* was recovered from all isolations and the resulting cultures all tested positive with an AG2-1 specific real-time PCR assay (Budge *et al*., 2009a), thereby confirming Koch's postulates. No *Rhizoctoinia* colonies were recovered from attempted isolations taken from 20 stem pieces of the control material. *Rhizoctonia solani* has been reported in *Matthiola* previously (Benson & Cartwright, 1996) but there is no knowledge of which AG is the causal agent. Here, we report AG2-1 as the causal agent in the UK and demonstrate that it can be an important plant pathogen within the Brassicaceae. *Rhizoctonia solani* AG2-1 has been reported previously in various *Brassica* crops in the UK (Budge *et al*., 2009b) and potatoes (Woodhall *et al*., 2007) and is frequently detected in UK field soils (Woodhall *et al*., 2013). The Brassicaceae includes many crop species and therefore careful consideration needs to be given to the presence of AG2-1 in soil prior to planting susceptible plants in this family.

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Figure 1

Figure 2

Table 1. Incidence of stem infection (%), disease index and presence of root infection in two *Matthiola* varieties inoculated with *Rhizoctonia solani* AG2-1.

	Stems infected (%)	Roots	Average disease index*
Matthiola incanca			
Controls	0	0	0^a
Inoculated	100	0	2.33^b
Matthiola 'Cinderella'			
Controls	0	0	0^a
Inoculated	100	0	2.82^b
L.s.d.			0.54
S.e.d.			0.27
%cv			50.7

*Numbers which share the same letters are not statistically significant at $p < 0.05$. Genstat (17th edition) was used for statistical analysis (general ANOVA).

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