New Disease Reports

Identification of '*Candidatus* Phytoplasma solani' (16Sr XII-A) infecting strawberry plants in the United Kingdom

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In May 2014, strawberry plants (*Fragaria* x *ananassa* variety Amesti™) growing in Norfolk, East Anglia (UK) were observed showing stunting, yellowing and poor establishment. The young plants had been imported from Spain in March 2014, and were cultivated over 1.35 hectares on a table-top system under polytunnels, where approximately 1% of the crop showed symptoms as described above.

Leaf material was collected from thirteen randomly selected plants. DNA was extracted using the CTAB method of Doyle & Doyle (1990). Samples were tested by real-time PCR using the universal phytoplasma assay (Hodgetts *et al*., 2009) and three of the samples were found to be positive. Nested PCR of the 16S rRNA gene was performed using universal phytoplasma primers P1 and P7, followed by R16F2n and R16R2 as described in Hodgetts *et al*. (2007), where the same three samples produced the specific 1,250 bp amplicon. PCR amplicons were cloned into the pGEM®-T Easy Vector System (Promega) and four randomly selected clones from each sample were sequenced. Analysis of the clones revealed the presence of single nucleotide polymorphisms (SNPs) within each of the samples, containing 6, 7 or 8 SNPs. The most prevalent sequence was submitted to NCBI (GenBank Accession No. KM406462). Phylogenetic analysis and sequence identification were undertaken which identified the phytoplasma as a '*Candidatus* Phytoplasma solani'-related strain, with 100 % similarity to numerous strains of '*Ca* P. solani', and 99.6 % sequence similarity to the type strain STOL11 (AF248959) (Fig. 1).

'*Ca*. P. solani" has been previously reported in strawberry in Italy (Terlizzi *et al*., 2006), whilst numerous other phytoplasmas have been identified in strawberry plants in various countries. To our knowledge, this is the first time '*Ca*. P. solani' has been detected in the UK, and is a significant finding as the phytoplasma is an EPPO (European and Mediterranean Plant Protection Organization) A2 listed pathogen. As a result, all of the infected plants have been destroyed and containment and eradication measures are in place. Additional surveys to identify the presence of potential vectors are underway and surveillance action will be undertaken.

Acknowledgements

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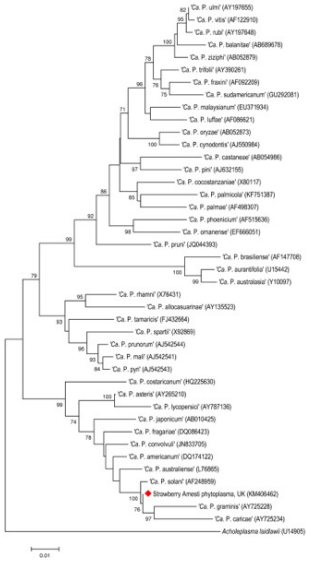

Figure 1

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