



First report of the natural occurrence of group 16SrII 'Candidatus Phytoplasma aurantifolia' in two *Solanum* species in Iran

S. Samavi¹, M.M. Faghihi^{1*}, H. Hasanzadeh¹, A.N. Bagheri¹, M. Salehi² and P. Sotoudehnia¹

¹ Hormozgan Agriculture and Natural Resources Research Center, Bandar Abbas, Iran; ² Fars Agriculture and Natural Resources Research Center, Shiraz, P.O.Box 1151-71955, Iran

*E-mail: mm.faghihi@yahoo.com

Received: 26 Jun 2012. Published: 16 Nov 2012. Keywords: *Solanum nigrum*, *Solanum surattense*, Peanut witches' broom phytoplasma group

A survey for phytoplasma was carried out in citrus orchards in Hormozgan province of Iran in 2009 to assess the presence of 'Candidatus Phytoplasma aurantifolia' in non-citrus hosts. Symptoms of witches' broom, little leaf, short internode and yellowing were observed in *Solanum nigrum* (Fig. 1) and *S. surattense* (Fig. 2). *S. nigrum* (black nightshade) is an annual plant and one of the most cosmopolitan herb species (Edmonds & Chweya, 1997). The other medicinal herb, *S. surattense*, is highly polymorphic in phenotype but characteristically with scattered stellate hairs and prickly stem (Heiser, 1969). Phytoplasma DNA was detected in symptom-bearing plants using a nested polymerase chain reaction (PCR) assay. For each plant, total DNA was extracted separately from 0.5 g of leaf midribs of four symptom-bearing and two symptomless plants using a modified CTAB protocol (Doyle & Doyle, 1990). DNA samples were analysed with phytoplasma universal 16S rDNA primers, P1/P7 for direct PCR primers and R16F2n/R16R2 for the nested reaction, which yielded PCR products of approximately 1800 and 1250 bp, respectively. The 1800 and 1250 bp PCR products were amplified from all the symptom-bearing but not from the healthy plants, nor from the negative control. The nested PCR products were cloned (InsTAclone PCR kit K1214, Fermentas, Lithuania) and sequenced. BLAST search revealed that the obtained 16S rDNA sequences of the *S. nigrum* (GenBank Accession No. GQ866886) and *S. surattense* (GU550504) phytoplasmas shared 99% of nucleotide identity with each other and with the 16S rDNA sequences of members of the group 16SrII, 'Ca. P. aurantifolia' formerly 'Peanut witches' broom'. This is the first report of natural occurrence of phytoplasmas in *S. nigrum* and *S. surattense* in Iran. Salehi et al, (2002)

proved dodder greenhouse transmission of a 'Ca. P. aurantifolia' to *Solanum* species, including *S. nigrum*, *S. integrifolium* and *S. melongena*. However, results from our study suggest that *S. nigrum* and *S. surattense* may play a role as natural intermediate hosts for the 16SrII phytoplasmas in the Hormozgan province of Iran.

Acknowledgements

The authors are grateful to Dr. Majeed Askari Seyahooei for his valuable suggestions. This work was supported by Hormozgan Agriculture and Natural Resources Research Center, Bandar Abbas, Iran.

References

- Doyle JJ, Doyle JL, 1990. Isolation of plant DNA from fresh tissue. *Focus* 12, 13-15.
- Edmonds JM, Chweya, JA. 1997. Black nightshades: *Solanum nigrum* L. and related species. Rome, Italy: International Plant Genetic Resources Institute.
- Heiser CB, 1969. The Wonderberry. In: Freeman WH, eds. *Nightshades - Paradoxical Plants*. San Francisco, USA: Freeman and Co, 62-105.
- Salehi M, Izadpanah K, Taghizadeh M. 2002. Witches' broom disease of lime in Iran: New distribution areas, experimental herbaceous hosts and transmission trials. In: *Proceedings 15th Conference of International Organisation of Citrus Virologists (IOCV)*, 2002, Riverside, CA, USA, 293-296.



Figure 1



Figure 2

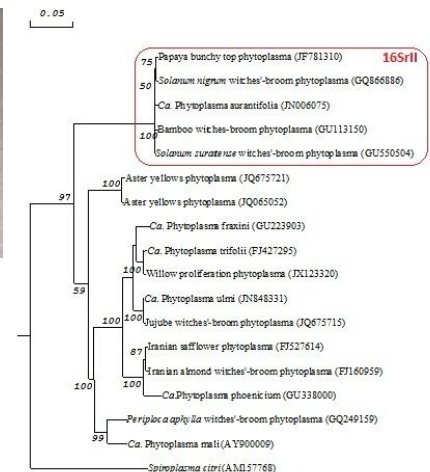


Figure 3

To cite this report: Samavi S, Faghihi MM, Hasanzadeh H, Bagheri AN, Salehi M, Sotoudehnia P, 2012. First report of the natural occurrence of group 16SrII 'Candidatus Phytoplasma aurantifolia' in two *Solanum* species in Iran. *New Disease Reports* 26, 23.

[http://dx.doi.org/10.5197/j.2044-0588.2012.026.023]

©2012 The Authors

This report was published on-line at www.ndrs.org.uk where high quality versions of the figures can be found.