

Disease Notes



# First Report of Stolbur Phytoplasma Affecting *Cichorium intybus* in Serbia

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## Abstract

Chicory (*Cichorium intybus*, Asteraceae) is a typical Mediterranean plant indigenous to Europe, western Asia, Egypt, and North America (3). It is commonly consumed as a fresh vegetable in salads. In rural areas of Serbia it grows as a weed in crops, but it is used in folk medicine to treat skin disorders due to its antihepatotoxic activity (3). Methanol extracts of chicory leaves showed moderate antibacterial activity against enteric bacteria (3). A phytoplasma-like disease, expressed as proliferation of chicory shoots and flowers, was observed on wild plants for the first time in Obrenovac vicinity (44°40' N, 20°20' E) in July 2012. A flattening of the stem with a large number of filamentous leaves, contortion and abnormal growth of flowers on the stem (typical fasciation symptoms) were observed. Diseased plants did not produce seeds. Total DNA was extracted from the leaf midveins of 15 symptomatic and five symptomless plants (4). PCR amplification of 1.5-kb 16S rDNA fragment was performed using DreamTaq Green master mix (Thermo Scientific, Lithuania) and phytoplasma universal primer pairs

P1/16S-Sr (1). Products of nested PCR (1.2 kb) were obtained using primer pair R16F2n/R2 (1). Both amplicons were detected in all diseased samples; however, DNA from symptomless samples yielded no amplicons. Restriction fragment length polymorphism (RFLP) analysis of R16F2n/R2 PCR products was performed in independent reactions using four endonucleases (*AluI*, *TruI*, *HhaI* and *HpaII*). RFLP patterns from chicory samples were compared to those of Stolbur (STOL), Aster Yellows (AY), Flavescence Dorée-C (FD-C), Poinsettia Branch-Inducing (PoiBI), and Clover Yellow Edge (CYE) phytoplasmas (1). All RFLP profiles from the chicory samples were identical to STOL reference strain, indicating that diseased chicory was affected by a phytoplasma that belongs to '*Candidatus Phytoplasma solani*' (16SrXII-A group). The 16S rDNA sequence of representative sample from symptomatic plant (Vp4) was deposited under accession number KF661322 in NCBI GenBank. It showed 100% identity to KF263684.1 from Iranian peach, JQ730742.1 from Serbian valerian, and JQ730750 from Serbian corn, all belonging to the '*Ca. P. solani*' taxon. Puna chicory disease on *C. intybus* associated with a subgroup 16SrV-B of phytoplasma was detected in China (2). This is the first report of the Stolbur phytoplasma associated with fasciation of *C. intybus* in Serbia and worldwide.

*References:* (1) I. M. Lee et al. *Int. J. Syst. Evol. Microbiol.* 56:1593, 2006. (2) Z. N. Li et al. *Can. J. Plant Pathol.* 34:34, 2012. (3) J. Petrovic et al. *Fitoterapia* 75:737, 2004. (4) J. P. Prince. *Phytopathology* 83:1130, 1993.



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