

**'Candidatus Liberibacter solanacearum' associated with *Bactericera trigonica* - affected carrots in the Canary Islands.**

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In 2009 and 2010, commercial carrot (*Daucus carota* L.) fields located in Tenerife (Canary Islands, Spain) showed symptoms of curling, yellow, bronze and purple discoloration of leaves, stunting of shoots and tap roots, and proliferation of secondary roots. A high population of the psyllid *Bactericera trigonica* was noted on those fields. Similar symptoms were reported before in carrot production areas of the Canary Islands and mainland Spain and associated with stolbur and aster yellows (1997 and 1998) (2); and *Spiroplasma citri* and phytoplasmas (2009 and 2010) (1). These symptoms were also reported in Southern Finland in 2008 and associated with 'Candidatus Liberibacter solanacearum' (4). Studies were conducted to investigate whether these pathogens and the psyllid *B. trigonica* were associated with the observed symptoms in carrot in Tenerife. A total of 18 petiole samples of symptomatic carrots were collected in 2009 (13 samples) and 2010 (5 samples), respectively. Five asymptomatic plants were also sampled. Three samples of psyllids (five individuals grouped) collected from one affected field in 2010 were also included in the assay. Total DNA was extracted with DNeasy Plant Mini Kit (Qiagen, Valencia, CA), and analysed by nested-PCR assays using primer pairs P1/P7 and R16F2n/R16R2n for phytoplasmas, and ScR16F1/ScR16R1 followed by ScR16F1A/ScR16R2 for *S. citri* detection as described before (3). PCR was performed using primer pairs OA2/OI2c and CL514F/R to amplify a portion of 16S rDNA and *rplJ/rplL* ribosomal protein genes, respectively, for '*Ca. L. solanacearum*' (4). *S. citri* and phytoplasmas were not detected in any of the studied samples. However, a 1,168 bp of 16S rDNA fragment and 669 bp *rplJ/rplL* fragment was amplified from DNA from 16 symptomatic carrot samples and three psyllid grouped samples using specific primers for '*Ca. L. solanacearum*'. No DNA was amplified from the asymptomatic samples. These results indicate the presence of *Ca. L. solanacearum* in the affected carrot and psyllid samples collected in Tenerife (Canary Islands). Four and one PCR products obtained from DNA of carrot and psyllid samples respectively with both primer pairs were sequenced. BLAST analysis of the 16S rDNA sequences obtained from infected carrots (GenBank Accession Nos. HQ454312, HQ454313, HQ454314, HQ454315) and psyllids (HQ454316) showed 99% identity to those of '*Ca. L. solanacearum*' amplified from carrot in Finland (GU373049) and from *B. cockerelli* (EU812557). The *rplJ/rplL* nucleotide sequences obtained from infected carrots (Accession Nos. HQ454317, HQ454318, HQ454319, HQ454320) and psyllid (HQ454321) were 98% identical to the analogous *rplJ/rplL* '*Ca. L. solanacearum*' ribosomal protein gene from carrot (GU373051) in Finland and tomato (EU834131) from New Zealand. This is the first report of '*Ca. L. solanacearum*' associated with psyllid-affected carrots in the Canary Islands (Tenerife, Spain) and also the first report of this plant pathogen associated with *B. trigonica*.

**References:** (1) M.C. Cebrián et al. *Plant Dis.* 94: 1264, 2010. (2) M.I. Font et al., *Bol. San. Veg. Plagas* 25: 405-415, 1999. (3) I-M. Lee et al. *Plant Dis.* 90: 989-993, 2006. (4) J.E. Munyaneza et al. *Plant Dis.* 94: 639, 2010.