Common sowthistle (Sonchus oleraceus) is a major weed problem in Iran and is also used for medicinal purposes. During 2012-2015 surveys of Fars and Yazd provinces (Iran) for phytoplasma diseases, a phyllody disease was observed in S. oleraceus plants growing as weeds within and/or in the surroundings of fields and orchards. The main symptoms of the disease were yellowing and reddening of leaves, shortened internodes, flower virecence, phyllody, proliferation and witches' broom (Fig. 1).

Total DNA was extracted from 0.2 g of leaf midribs of eight symptomatic (four plants per province) and four symptomless (collected in Fars province) S. oleraceus plants using the CTAB method of Zhang et al. (1998). DNA samples were tested for phytoplasma presence by a nested PCR assay primed by primer pairs P1/P7 followed by R16F2n/R16R2 (Lee et al., 1998). Amplicons of ~1.25 kb were obtained in the nested round from all eight diseased plants but not from the four symptomless plants. Eight nested amplicons were separately cloned and sequenced. The obtained sequences were identical and a consensus sequence corresponding to the Abarkooh (Yazd Province, Iran) S. oleraceus phyllody phytoplasma strain was deposited in GenBank (Accession No. MG656267). The S. oleraceus phytoplasma strain had 99.78% sequence identity with the 'Ca. P. asteris' reference strain (M30790). A BLAST search showed that this sequence had maximum identity (99-100%) with members of the 16SrI subgroup B. Phylogenetic analysis using the neighbour-joining method (MEGA7) (Fig. 2) showed that the Abarkooh S. oleraceus phytoplasma strain was clustered within the 16SrI group closest to onion yellows phytoplasma (NC_005303), representative of subgroup 16SrI-B.

A 16SrI-A phytoplasma has been previously reported in S. oleraceus in Canada (Khadhair et al., 2008), however to our knowledge this is the first report of a 16SrI-B phytoplasma strain associated with S. oleraceus phyllody disease. The occurrence of 16SrI-B phytoplasma strains was previously reported in Iran on Brassica napus (Salehi et al., 2011), Eruca sativa (Esmailzadeh Hosseini et al., 2017) and Eucalyptus camaldulensis (Salehi et al., 2016). S. oleraceus may act as a reservoir host.

References

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