Peganum harmala is a new plant host of ‘*Candidatus* Phytoplasma aurantifolia’

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Espand (*Peganum harmala*) in Persia has been used in traditional medicine as emmenagogue and abortifacient. It has various pharmacological effects such as antifungal, antibacterial, hypothermic, anticancer, antinociceptive, and reversible monoamine oxidase inhibition. This plant is widely distributed in several parts of the world and is a native plant from the Mediterranean to central and south-west Asia (Marwat and ur Rehman 2011). In April 2019, Espand witches’ broom (EWB) disease symptoms were observed in Forg (Fars Province, Iran). The infected plants showed witches’ broom, little leaves, flattened stem and twisting the shoots. To investigate phytoplasma presence, total DNA extracted from four symptomatic and four asymptomatic plants were tested by nested PCR using P1/P7 followed by R16F2n/R16R2. Amplicons of the expected sizes (1.8 and 1.25 kb) were amplified in direct and nested PCR from the samples collected from the all symptomatic plants but not from the asymptomatic plants and DNA template free used as negative control. All amplicons from the nested PCR round were cloned and sequenced and three sequences were deposited in GenBank under accession numbers MK760256–MK760258. BLAST search analysis of sequences data showed 100% identity with ‘*Candidatus* Phytoplasma aurantifolia’ clone CpSD1 found in chickpea in

India (MK217101), unnamed clone classified to 16SrII-D subgroup detected in eggplant from Saudi Arabia (MK465072), and FSD-SF-17 isolate from sunflower grown in Pakistan (MK424332). Restriction fragment length polymorphism (RFLP) analysis with *AluI*, *HhaI*, *HinfI*, *HpaII*, *MseI*, *RsaI*, *Sau3AI* and *TaqI* enzymes of R16F2n/R16R2 amplicons and comparison of the obtained profiles with the patterns for the reference strains (Lee et al. 1998) showed that the phytoplasma found in the espand plants was a member of 16SrII-D subgroup. To our knowledge, this is the first report of the phytoplasma detection in espand in Iran and probably in the world. Further investigation is needed to find the insect involved in the phytoplasma transmission.

Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interest.

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