Association of a 16SrIX-A phytoplasma with *Conocarpus erectus* showing stem fasciation and its vector in Iran

Chamran Hemmati¹ · Mehrnoosh Nikooei¹ · Abdullah M. Al-Sadi²

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Conocarpus erectus, also known as buttonwood, is widely planted as an ornamental plant in southern Iran. In June 2020, symptoms of stem fasciation, shoot twisting and leaf rolling were observed in plants in Bandar Abbas (Hormozgan Province, Iran), with an incidence level of 10%. This study was carried out to identify the associated phytoplasma and its vector. *Orosius albicinctus* were collected from symptomatic *C. erectus* plants and 5 adults per plant were caged on ten periwinkle plants for 60–80 days. DNA was extracted from fifteen symptomatic, ten asymptomatic plants and periwinkle (at the end of transmission assays), followed by nested PCR using P1/P7 and R16F2n/R16R2 primers. The PCR products of expected sizes (1.8 and 1.25 kb, respectively) were detected from the symptomatic plants and periwinkles but not from the asymptomatic or negative control. Three sequences of nested PCR amplicons were deposited in GenBank under accession numbers MT712209–MT712211. BLAST search showed their 100% identity with the pigeon pea witches' broom phytoplasma sequence (AF248957). Restriction fragment length polymorphism (RFLP) analysis with *AluI*, *HhaI*, *HinfI*, *HpaII*, *MseI*, *RsaI*, *Sau3AI* and *TaqI* enzymes of R16F2n/R16R2 amplicons and the comparison of the obtained profiles with those of the reference strains (Gundersen et al. 1996) showed that the buttonwood phytoplasma is a member of 16SrIX-A subgroup. Furthermore, this phytoplasma was experimentally transmitted to healthy periwinkle

plants by the leafhopper *Orosius albicinctus*, with the 30% transmission efficiency. The association between 16SrII-D phytoplasma and diseased buttonwood has been reported from Iran (Azimi et al. 2017), however, this is the first report of the detection of 16SrIX-A phytoplasma and its insect vector in buttonwood in the world. Given that *C. erectus* is widely planted as ornamental species in southern Iran where the presence of *O. albicinctus* is common, this may present a high risk for an outbreak.

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Declarations

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

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✉ Chamran Hemmati
chamran.hemmati@gmail.com

¹ Department of Agriculture, Minab Higher Education Center, Plant Protection Research Group, University of Hormozgan, Bandar Abbas, Iran

² Department of Plant Sciences, College of Agricultural and Marine Sciences, Sultan Qaboos University, Muscat, Oman