



Austroagallia sinuata transmission of “*Candidatus* Phytoplasma aurantifolia” to *Zinnia elegans*

Chamran Hemmati^{1,2} · Mehrnoosh Nikooei¹

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Phytoplasmas are insect-vectored pathogens causing characteristic and destructive diseases in ornamental plants. Although *Zinnia elegans* phyllody (ZeP) was reported from Iran in 2017, no insect vector was identified (Hemmati and Nikooei 2017). Here we report successful transmission of ZeP phytoplasma to *Z. elegans* by *Austroagallia sinuata*. For transmission assays, a total of 20 *Z. elegans* seeds were provided and sown in 20 pots under cages. A total of 78 (5–7 individuals per cage) adults of *A. sinuata* collected from naturally-infected *Z. elegans* in municipal lands and parks in Bandar Abbas were transferred to 15 of the pots (at four leaf stage) for 2 weeks as inoculation access phase. Five cages with five healthy *Z. elegans* plants were not exposed to leafhoppers. The plants in each cage were continuously monitored for symptom expression up to 60–80 days post inoculation. The naturally infected *Z. elegans*, insects and the symptomatic *Z. elegans* plants in experimental cages after transmission test were analyzed for the presence of phytoplasma using PCR assays with primer pair P1/P7 followed by R16f2n/R16r2 (Gundersen and Lee 1996). Eight to 10 weeks after inoculation, 13 of 15 inoculated plants showed typical symptoms, including bud proliferation, phyllody, virescence, general chlorosis, and stunting. Nine amplified R16f2n/R16r2 primers PCR products from three experimentally vector challenged *Z. elegans*, three naturally infected *Z. elegans* and three insects

were sequenced bidirectionally and one sequence from each host was deposited in GenBank (Accession Nos. MK424862–4). All sequences were aligned (Clustal Omega) and they shared 100% identity to each other, and BLAST analysis of the 16S rDNA sequences revealed that the phytoplasmas were all strains of 16SrII subgroup D. In addition, phytoplasma sequences yielded the same RFLP patterns after restriction with *AluI*, *HhaI*, *HinfI*, *HpaII*, *MseI*, *RsaI*, *Sau3AI* and *TaqI* enzymes. To our knowledge, this is the first evidence of phytoplasma vector ability of *A. sinuata* in the world.

References

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✉ Chamran Hemmati
Chamran.hemmati@hormozgan.ac.ir

¹ Department of Agriculture, Minab Higher Education Center, University of Hormozgan, Bandar Abbas, Iran

² Plant Protection Research Group, University of Hormozgan, Bandar Abbas, Iran