

Molecular and biological studies of pear decline agent and its dispersal patterns in Fars province

Fars has over 309 hectares of pear and 1145 hectares of quince trees. In a survey during 2007 and 2008, symptom of pear decline (PD) disease was observed in different areas of Fars. The major symptoms of the disease were abnormal reddening of foliage in early fall, leaf curl, defoliation on leaves and slow decline. Because these are symptoms similar to the pear decline disease, we use biological and molecular tests to confirm phytoplasma existence. In addition, for grafting the young trees, symptom of this disease appeared one year after grafting and next dodder transmission to periwinkle. After 9 months appeared yellowing and small leaves. For phytoplasma detection in orchards of college of agriculture of Shiraz University and zangene village of Arzhan division, samples of leaves were collected from pear trees and pear psylla (*Cacopsylla pyricola*) on healthy and unhealthy. In 12 samples of symptomatic pear of college of agriculture of Shiraz University and 7 samples of symptomatic pear of Zangene village of Arzhan division, and 7 samples of psyllids, that collected these areas and 7 samples of incubated pear and quince by grafting and 3 samples of periwinkles herb that diseased by dodder transmission of pear decline phytoplasma in Nested-PCR with pair primers R16F2n/R16R2 and fO1/rO1 amplified and disease was augmented. Total nucleic acid was extracted from leaves and psyllids. Nested-PCR was used for detection of PD phytoplasma using P1/P7 primer pair universal primer pair R16F2n/R16R2 (1.2 kbps), and fO1/rO1(1050 bps) an apple proliferation phytoplasma group specific primer pair. No amplification was detected using DNA from asymptomatic samples. Digested with *Hinf*I, *Rsa*I, *Alu*I and *Taq*I enzymes and RFLP pattern from a pear tree and psyllid samples revealed the presence of the same phytoplasma. On the basis of disease symptoms, biological characteristics and positive reaction of PCR, pear decline in Fars has phytoplasmal etiology. Based on amplification with fO1/rO1, apple proliferation phytoplasma group specific primer pair and RFLP pattern and detection in pear trees it can be concluded that the detected phytoplasma in Fars province is *Candidatus* Phytoplasma pyri.

Key words: Pear decline, Transmission, Fars province, PCR, RFLP



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