



First report of pear stony pit disease from India

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During a routine survey in June 2012, pear trees (*Pyrus communis*) bearing deformed fruits, along with occasional chlorotic spots on leaves (Fig. 1), were observed in nine pear orchards located in Shimla district in Himachal Pradesh, India. Critical observations of the fruit revealed deformities, with the formation of pits, corky tissues beneath the pits, misshapen fruit and russeting on the surface (Figs. 2, 3, 4). These symptoms are similar to those of pear stony pit disease, known to be prevalent in other countries (Kegler *et al.*, 1976; Thomsen, 1989). Such symptoms were exhibited by 80% of the fruit borne on ailing trees in the affected orchards making the produce unmarketable. Leaf samples from pear plants with and without symptoms were taken from each survey orchard and tested for virus infection using DAS-ELISA with antisera (BIOREBA AG, Switzerland) specific for *Apple stem grooving virus* (ASGV; genus *Capillovirus*), *Apple stem pitting virus* (ASPV; genus *Foveavirus*) and *Apple chlorotic leaf spot virus* (ACLSV; genus *Trichovirus*). ELISA testing revealed the presence of ASPV and ACLSV in samples taken from trees showing symptoms. Samples not showing symptoms tested negative. Pear stony pit disease associated with ASPV infection has already been reported from other pear growing countries (Nemeth, 1986; Paunović *et al.*, 1999).

To confirm the association of ASPV and ACLSV with stony pit disease reported here, RT-PCR detection was carried out using ASPV and ACLSV coat protein gene specific primer pairs (Kundu, 2003; Nickel *et al.*, 2001). RT-PCR amplification resulted in amplicons of the correct size: 264 and 582 base pair fragments of coat protein gene of ASPV and ACLSV, respectively. Partial sequences of CP gene of ASPV and ACLSV obtained after cloning, sequencing and analysis were deposited in GenBank (ASPV and ACLSV Accession Nos. KC154860 and KC154861 respectively). Phylogenetic analysis of ASPV isolate (KC154860) showed 98% sequence similarity with a Chinese isolate (JF895517), whereas the ACLSV isolate

(KC154861) showed 98% sequence similarity with a Japanese isolate (AB326230) and 96 and 95% similarity with isolates already reported from India (Kashmir, FN550875 and Nihari, AM494508, respectively). The presence of symptoms that are typical of stony pit disease, and the association of ASPV and ACLSV with the disease, have demonstrated the previously unrecorded, natural occurrence of pear stony pit disease in India.

References

- Kegler H, Kleinhempel H, Verderevskaia TD. 1976. Investigation on stony pit virus. *Acta Horticulturae* **67**, 209-218.
- Kundu JK, 2003. The occurrence of *Apple stem pitting virus* and *Apple stem grooving virus* within field-grown apple cultivars evaluated by RT-PCR. *Plant Protection Science* **39**, 88-92.
- Nemeth M, 1986. Virus, mycoplasma and rickettsia diseases of fruit trees. Dordrecht, The Netherlands: Martinus-Nijhoff Publishers.
- Nickel O, Fajardo TVM, Jelkmann W, Kuhn GB, 2001. Sequence analysis of the capsid protein gene of an isolate of *Apple stem grooving virus*, and its survey in Southern Brazil. *Fitopatologia Brasileira* **26**, 655-659. [http://dx.doi.org/10.1590/S0100-41582001000300014]
- Paunović S, Maksimović V, Ranković M, Radović S, 1999. Characterization of a virus associated with pear stony pit in cv. Württemberg. *Journal of Phytopathology* **147**, 695-700. [http://dx.doi.org/10.1046/j.1439-0434.1999.00449.x]
- Thomsen A, 1989. Pear stony pit. In: Fridlund PR, ed. *Virus and virus-like disease of pome fruits and simulating noninfectious disorders*. Pullman, WA, USA: Washington State Cooperative Extension, Washington State University, 253-267.



Figure 1

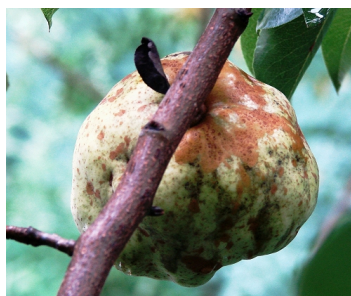


Figure 2



Figure 3



Figure 4

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