



First report of *Hosta virus X* infecting *Hosta* in the Czech Republic

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Hostas (*Hosta* spp.) are popular herbaceous perennial plants represented by over 7000 varieties, and widely cultivated due to their diversity in leaf shape and colour patterns, shade tolerance and pest resistance. In the Czech Republic, hostas are grown as outdoor ornamental plants. At least four viruses in hosta have been reported in the world, but *Hosta virus X* (HVX) is the most economically important virus infecting hostas (Ryu *et al.*, 2006). HVX is a member of genus *Potexvirus* (family *Flexiviridae*), and was first identified and described in Minnesota, USA in 1996 (Currier & Lockhart, 1996). Since then, HVX was reported in hosta in Tennessee and Ohio, USA (Fajolu *et al.*, 2009; De la Torre, 2009) and from Korea and Poland (Park & Ryu, 2003; Cajza & Zielińska, 2007). Leaves infected with HVX commonly show symptoms of mosaic, mottling, interveinal chlorosis between secondary veins and leaf desiccation, and deformation. Infected plants often exhibit reduced growth and dieback. HVX can be transmitted from infected to healthy plants by cutting practices used for propagation and breeding, as well as in HVX-contaminated soils (Ryu *et al.* 2006).

During 2010, a total of twenty five hosta plants of five different species and twenty different cultivars showing various virus-like symptoms including mosaic, mottling (Fig. 1), leaf chlorosis and leaf distortion were collected from six locations throughout the Czech Republic. Presence of HVX was also tested on plants without symptoms, but occurrence of HVX was not detected in these plants. Plants were mostly obtained from the collection of hosta cultivars at Lednice (Faculty of Horticulture, Mendel University Brno), Botanical Garden and Arboretum (Mendel University Brno), horticulture in Prague, and gardens in Brno. Other samples were purchased at garden centres in South Moravia and Central Bohemia. Total RNA was isolated from 100 mg of fresh leaf tissue from all hosta plants collected using the RNeasy Plant Mini Kit (Qiagen, Germany). The presence of HVX was confirmed by RT-PCR using a specific primer pair PHVXCP5 and PHVXCP3 that amplifies the HVX coat protein (CP) gene (Park & Ryu, 2003). HVX amplification products of the expected size (663 bp) were obtained for 19 out of 25 hosta plants analysed.

Seven isolates of HVX were sequenced and resulting sequences were aligned and showed nucleotide identities ranging from 99 to 100%, when compared with each other. BLAST analysis yielded identities from 98 to 100% when HVX sequences were compared with those available in GenBank (HVX-Kr, Accession No. AJ620114 and HVX-U, AJ517352). Comparison of deduced amino acid sequence of CP gene from all the Czech isolates and HVX-Kr and HVX-U showed identities from 99 to

100%. The nucleotide sequence data of CP genes reported in this article have been deposited in GenBank under Accession Nos. JF301948-JF301954. In Europe, HVX has been previously reported only from Poland (Cajza & Zielińska, 2007). Therefore this is the first report of the occurrence of HVX in the Czech Republic. HVX is easily mechanically transmitted and can survive in the infected plants without showing symptoms for years. More than 56 hosta cultivars have been found to be susceptible to this virus in USA (De la Torre, 2009). To minimise HVX spread, the planting of HVX-free hostas and destroying of HVX-infected plants are recommended. The combination of RT-PCR and sequencing proved the best approach for a reliable and specific diagnostic of HVX in the Czech Republic.

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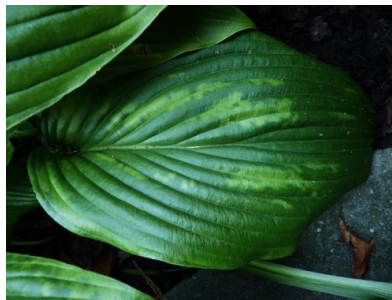


Figure 1

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