Potyviruses and tobraviruses infecting ornamental Allium species in the United Kingdom

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In autumn 2013, a wide range of bulbs of ornamental Allium species was planted in the Royal Horticultural Society's garden at Wisley to assess their vigour and aesthetic qualities. The trial included 179 accessions of plant material, representing 32 species or hybrids, from six nurseries in the United Kingdom or The Netherlands. Yellow flecking and striping with occasional reddening on the leaf surfaces and leaf curling was observed on many of the plants during April 2015 (Figs. 1-4). Leaf samples were collected from symptom-bearing plants of 20 accessions. RNA was extracted using an RNasy Plant Mini Kit (Qiagen, Manchester, UK) and tested by RT-PCR using broad-spectrum primers for carlaviruses and tospoviruses (Agdia, Elkhart, USA), potyviruses (Marie-Jeanne V, Ioos R, Peyre J, Alliot B, Signoret P, 2000). The remaining amplicons of the primer sets. A. jesdianum ‘Pendjikent’, A. nigrum and A. siciulm (syn. Nectaroscordum siciulm) tested positive using the carlavirus primers but it was not possible to sequence the product. The remaining amplicons of the expected size were directly sequenced in both directions and were identified by BLAST analysis; representative sequences were deposited in GenBank (Table 1). GenBank Accession Nos. KT223098, KT223099, KT223100, KT223101, KT223102 and KT223103 had 98, 98, 99, 92, 99 and 85 % nucleotide sequence identity with Leek yellow stripe virus (AB194628), Onion yellow dwarf virus (KR025485), Ornamental onion stripe mosaic virus (OrOSMV; EU042750) and TuMV (AB701497). The limited sequence identity of the isolate belongs to a distinct strain. This is the first report of PEBV (PEBV; X14006) infecting Allium and does not accord with Brunt et al. (1996) who reported that A. cepa was not experimentally susceptible to the virus. The remaining viruses have been reported previously from Allium spp. However, with few exceptions such as Noda et al. (1989), the specific identity of ornamental hosts has not been reported and therefore this is the first report of many of these virus-host associations. This is also the first report of OrOSMV in the UK. Since the early 1800's ornamental Allium species have been grown widely in UK gardens as herbaceous perennials. They are prized for their architectural qualities and large, colourful umbels that attract pollinating insects. They are generally hardy and well suited to most UK soil types (Block, 2010). The increasing importance of ornamental Allium (including Nectaroscordum) is illustrated by the 8% rise in production area over the last 4 years (to 232 ha in 2014/15) in The Netherlands (Bloembollenkeuringsdienst, 2015).

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References


