First report of garlic virus D in *Allium stracheyi* from India

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Allium stracheyi, a member of the family Alliaceae, is a perennial herb which is used as culinary flavouring agent in Himalayan states of India, especially in Uttarakhand. It is known as *Jambu* or '*Jungli piyaz*' in local dialect and is also known to have medicinal properties. This *Allium* species is distributed along Afghanistan, Pakistan and Western Himalayas to the Central Himalayas in sub-alpine zone (at a height of 3,000–4,800 m). As the vegetative propagated allium crops are known to be infected by multiple viruses (Van Dijk 1994), this study was undertaken to investigate the status of viral infection in *A. stracheyi*. Ten plants were collected in March of 2018 from two fields of Pithoragarh region of Uttarakhand. Preliminary electron microscopic examination of negatively stained leaf dip preparations revealed flexuous rod shaped particles of ~800 nm. Based on the length and morphology of the particles, samples were tested for the presence of onion yellow dwarf virus (OYDV), garlic common latent virus (GarCLV), shallot latent virus (SLV) and allieviruses by reverse transcription (RT)-PCR, as described by Majumder and Baranwal (2014). OYDV, GarCLV and SLV were absent in the samples but allieviruses could be detected in all the samples tested. BLASTn analysis of the consensus nucleotide sequence (GenBank accession No. MK501979) showed 88.8 to 93.3% identity with garlic virus D (GarV-D) sequences. To confirm the identity, RT-PCR was

performed on eight allievirus positive samples collected in April 2019 using the GarV-D specific primer pairs. Amplicons of the expected ~870 bp in size were obtained from all the samples tested. Direct sequencing of the PCR products from four samples produced ~811-bp long nucleotide sequences. BLASTn analysis of the consensus nucleotide sequence (MT294142) showed 86.6–96.9% identity with GarV-D sequences. To our knowledge, this is the first report of GarV-D infecting *Allium stracheyi*.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

References

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