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NEW DISEASE REPORT

# First detection of orchid fleck virus on *Veronica spicata and Dendrochilum magnum*

V. Harju[1] | AR. Fowkes[1] | A. Skelton[1] | I. P. Adams[1] | S. Mcgreig[1] | S. M. D. Forde[1] | H. Pufal[1,2] | C. Conyers[1] | L. Frew[1] | A. Fox[1]

[1]Fera Science Ltd, York Biotech Campus, Sand Hutton, York, UK

[2]School of Natural and Environmental Sciences, Newcastle University, Newcastle upon Tyne, Tyne and Wear, UK

**Correspondence**
Aimee Fowkes, Fera Science Ltd, York Biotech Campus, Sand Hutton, York, YO41 1LZ, United Kingdom.
Email: Aimee.Fowkes@fera.co.uk

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A routine inspection by the Plant Health and Seed Inspectorate in April 2018, at a botanic garden in the south of England, led to the submission of two plant samples with possible virus symptoms to Fera Science Ltd. Leaves from *Veronica spicata* cv. Erika, were submitted with symptoms of broken necrotic rings on the leaves (Figures 1–2). Leaves of *Dendrochilum magnum* var. *glunaceum* were submitted with chlorotic rings and spots. *Veronica spicata*, a rare native in the UK and also a cultivated plant, has long, blue, pink or white flower spikes. *Dendrochilum magnum*, native to the Philippine highlands, is the largest orchid of its genus, forming chains of fragrant, cascading flowers. Both samples tested negative by ELISA for a broad range of viruses including tomato black ring virus, tomato spotted wilt virus (antisera from DSMZ, Germany), impatiens necrotic spot virus, strawberry latent ringspot virus, tomato black ring virus (Bioreba, Switzerland), cucumber mosaic virus, tobacco ringspot virus, tomato ringspot virus (Agdia, USA), and broad bean wilt virus 1 and 2 (Loewe, Germany).

Total RNA was extracted from 0.5 g leaf material from both samples, using a Qiagen RNeasy Plant Mini kit with a DNase step. The extracts were used to prepare a sequencing library using a ScriptSeq kit (Illlumina, USA) and sequenced on the Illumina MiSeq (Hammond et al., 2021). Orchid fleck virus (OFV) was identified in both *V. spicata* (complete bipartite genome: RNA1, 99% identity to Genbank Accession No. MK522804.1, and RNA 2, 99% identity to MK522807.1) and *D. magnum* (complete bipartite genome: RNA1, 99% identity to MW465659.1, RNA2, 99% identity to MK522807.1). The sequences obtained were uploaded to GenBank, (PP429909, PP429910, PP429912 and PP429913). HTS data is available under Bioproject PRJNA1081807. A PCR for OFV using Superscript master mix and primers (Ramos-González et al., 2016) confirmed the HTS results. A 390 base pair product was Sanger sequenced by Eurofins (Germany) and the sequence from both samples had 99% identity to Accession No. MG970603.1 and was submitted to GenBank (PP429911 and PP429914).



**FIGURE 1** *Veronica spicata* with ringspot symptoms of orchid fleck virus

OFV, species *Dichorhavirus orchidaceae*, family *Rhabdoviridae*, is transmitted by the false spider mite, *Brevipalpus californicus*, and both the virus and mite occur globally (Dey et al., 2022). Known to be damaging to species of orchid and citrus, it has a wide host range including liriope, cordyline and hollyhock (*Alcea rosea*) (Otero-Colina et al.,

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**FIGURE 2** Close up of *Veronica spicata* with ringspot symptoms of orchid fleck virus

2021). To the best of our knowledge, this is the first report of *V. spicata* as a host of OFV in the world. Records exist for a *Dendrochilum* sp. as a host of OFV (New Zealand Ministry for Primary Industries, 2021), however, not specifically for *D. magnum*, so this species can now also be confirmed as a host. In the context of large, nationally important plant collections, quarantine for newly acquired acquisitions and inspection and testing for unusual symptoms is important. This can help prevent the spread of viruses such as OFV which, due to its ubiquitous mite vector, have the potential to spread from known hosts into new ones. Commercially, virus symptoms can make affected plants unsaleable and can have significant economic consequences if left unchecked.

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## ORCID

*AR. Fowkes* https://orcid.org/0000-0001-7918-441X
*A. Skelton* https://orcid.org/0000-0002-5418-1930
*S. M. D. Forde* https://orcid.org/0000-0002-5121-5007
*A. Fox* https://orcid.org/0000-0003-1280-1836

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