**Freesia sneak virus** (FreSV) on freesia: a first detection for Virginia and the United States

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**ABSTRACT SUMMARY** Samples of freesia cvs. ‘Honeymoon’ and ‘Santana’ with unusual symptoms of leaf flecking (Fig. 1) were received from a commercial cut flower grower by the Virginia Tech Plant Disease Clinic in Spring 2008. Symptoms of coalescing, chlorotic, bleached, brown and purple leaf spots were scattered in the planting. After microscopic examination failed to reveal any pathogens or arthropods, images of the unusual symptoms were submitted to the APS Diagnostics Committee’s listserv. One responder suggested a newly reported virus, *Freesia sneak virus* (FreSV) might be the cause. Plant samples were forwarded to the USDA-ARS Floral and Nursery Plants Research Unit in Beltsville, MD, for viral analysis. In the Virginia freesia samples, presence of FreSV, but not *Freesia mosaic virus*, was strongly correlated with leaf necrosis symptoms. Use of the diagnostics listserv was instrumental in diagnosing this disease.

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**References:**


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**Freesia sneak virus** (FreSV) was transmitted by the soilborne fungus *Olpidium brassicae* and remained viable for years in vector resting spores in soil. No effective treatments for vector, so control is difficult. FreSV was first observed microscopically in 1988 and first characterized in early 1990’s.

**History of Freesia sneak virus**

- Necrotic symptoms on freesia described in the Netherlands, England and Germany by early 1970’s
- In the late 1980’s a similar problem was reported on freesia in Italy and the virus was partially characterized by 2006
- FreSV first reported in *Lachenalia* sp. from South Africa in 2007

**Taxonomy**

- Filamentous particles (ophis=Gr. for snake) form circular structures of various sizes
- Primarily negative single-stranded RNA particles
- Multipartite (3 to 4 segments)

**Diagnosis**

- RT-PCR with ophio-specific degenerate primers from the RdRp gene is used for species identification

**Current species**

- *Citrus psorosis virus*
- *Lettuce ring necrosis virus*
- *Mirafiori lettuce virus*
- *Ranunculus white mottle virus*
- *Tulip mild mottle mosaic virus*
- Proposed: *Freesia sneak virus* in infecting *Freesia* cultivars in South Africa. Plant Dis. 91: 770.

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**Ophiovirus**

- Proposed family: Ophioviridae
- All are plant-infecting (monocots and dicots)
- Found in both New and Old World
- Viral particles difficult to visualize with electron microscope
- First observed microscopically in 1988
- First characterized in early 1990’s

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**Fig. 1.** Symptomatic freesia submitted to the Virginia Tech Plant Disease Clinic.

**Fig. 2.** RT-PCR amplified the ophiovirus diagnostic band (136 bp) from 14 of 15 freesia plants tested. (L=molecular ladder, 1=healthy leaf tissue, 2=FreSV-infected lachenalia, 3=no template control, 4=symptomatic freesia sample)

**Fig. 3.** Potyvirus-like particles (A) and ophiovirus-like particles (B) were observed in partially purified virus preparation from symptomatic freesia samples using transmission electron microscopy.