First report of odontoglossum ringspot virus from *Cymbidium goeringii* (Orchidaceae) in Jiangsu Province, China

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Cymbidium goeringii is the type specimen of the species reported from Japan, and presently widely distributed in east Asia (Yao et al. 2007). Viral diseases are one of important restrictive factors for plants of the family Orchidaceae in the world, particularly those caused by odontoglossum ringspot virus (ORSV) and cymbidium mosaic virus (CymMV). Previously, both ORSV and CymMV were isolated from Phalaenopsis and Oncidium orchids in China (Liu et al. 2013), however, there are few reports on *C. goeringii*. During the spring to summer of 2017, virus-like symptoms such as yellowing, mottling, and mosaic were observed on *C. goeringii* in several commercial plantations in Jiangsu province. To identify the viruses, twenty-five samples with clear symptoms were collected in Jiangsu province. The viral RNA was extracted by TaKaRa MiniBEST Plant RNA Extraction

Kit (TaKaRa). One step RT-PCR was performed using a kit (Tiangen) according to the manufacturer's instructions, and the primers reported by Rao et al. (2015), which amplified a 500 and 600 bp long region of the CP gene of the two viruses, respectively. ORSV was detected in twenty-four (96%) *C. goeringii* samples by RT-PCR. However, CymMV was not detected by RT-PCR in these samples, possibly because of the limited samples. These results were confirmed by DAS-ELISA (Qiaodu). The purified amplicons were cloned and sequenced. Four sequences were determined and submitted to GenBank (MG773324-MG773327). BLASTN analysis showed that these sequences shared 99% nucleotide identity with a ORSV isolate (AF033848). To our knowledge, this is the first report of ORSV in *C. goeringii* in Jiangsu, China.

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References

- Liu FX, Han YC, Li WD, Shi XQ, Xu W, Lin MG (2013) Incidence of *Cymbidium mosaic virus* and *Odontoglossum ringspot virus* affecting Oncidium orchids in Hainan Island, China. Crop Prot 54: 176–180
- Rao X, Li Y, Sun J, Li X, Li MH, Xiang MM (2015) Genetic diversities of cymbidium mosaic virus and odontoglossum ringspot virus isolates based on the coat protein genes from orchids in Guangdong province, China. J Phytopathol 163:324–329
- Yao X, Gao L, Yang B (2007) Genetic diversity of wild *Cymbidium goeringii* (Orchidaceae) populations from Hubei based on inter-simple sequence repeats analysis. Front Biol China 2:419–424