First report of hot pepper endornavirus infecting pepper in China

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Received: 25 March 2019 / Accepted: 11 July 2019 / Published online: 29 July 2019
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Keywords Hot pepper endornavirus · Pepper · Natural infection

Hot pepper endornavirus (HPEV), a member of the family *Endornaviridae*, has not been reported in China. In June 2016, about 10% of pepper (*Capsicum annuum* L. cultivar Guofeng) plants exhibiting mild yellowing and tip wilt symptoms on leaves were noticed in two adjacent greenhouses in Feidong County, Hefei, Anhui Province, China. One leaf of eight individually symptomatic pepper plants were pooled for virus identification using high throughput small RNA sequencing (Sela et al. 2012). Raw data of 10 million reads (18 ~ 30 nt) were analyzed and assembled. BLASTn searches of the resultant contigs to database of viral genomes in GenBank identified about 253 contigs matching to four viruses including HPEV, cucumber mosaic virus (CMV, NC_002034.1, NC_002035.1 and NC_001440.1), tobacco vein clearing virus (TVCV, NC_003378.1), and pepper cryptic virus 1 (PCV-1, NC_037096.1, NC_037095.1) with high sequence identity (>95%). Among them, thirty-five contigs (85 nt ~ 2289 nt) had high identities (97 ~ 99%) with HPEV (KR080326). To confirm HPEV infection, RT-PCR using specific primer HPEVF (5'-CACGGCAGTAGCAAATAGCA-3', 12508 nt–12527 nt) and HPEVR (5'-TCCGTGTAAATTTGCGTGAA-3', 13034 nt–13053 nt) designed in-house showed three out of eight pepper samples were HPEV positive. Each PCR product amplified from three HPEV-positive pepper plants consisted

of 546 nt and shared 100% nucleotide identity with each other (one sequence accessed in GenBank at No. MK424054), and shared highest identity of 99% with isolate CS from South Korea (KR080326). Northern blotting using a probe of digoxigenin-labeled PCR fragment amplified by primer HPEVF and HPEVR also proved the HPEV infection in the three pepper plants. RT-PCR using specific primer (Jo et al. 2017) of TVCV, CMV and PCV-1 testified TVCV and PCV-1 existing in three HPEV-positive pepper samples, so symptoms could not be attributed only to HPEV. Altogether, this is the first report of a natural infection of HPEV on pepper in China.

Acknowledgments This study was financially supported by the National Natural Sciences Foundation of China (31571982).

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Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s42161-019-00366-8>) contains supplementary material, which is available to authorized users.

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