First report of strawberry pallidosis-associated virus infecting strawberry from Iran

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During summer 2019, virus-like disease symptoms were observed in strawberry (*Fragaria × ananassa*) fields in Kurdistan Province, Iran. Total RNA was extracted from one sample (P1F) using Gene JET Plant RNA Purification Kit (Thermo Fisher Scientific, Vilnius, Lithuania) and sequencing libraries were prepared using Colibri Stranded RNA Library Prep Kit for Illumina Systems (Invitrogen). The library was sequenced using a NovaSeq 6000 instrument (Illumina, San Diego, CA, USA) resulting in 80 million of 150b pair-end reads and CLC Genomics Workbench 9.5.1 (Qiagen) was used for de novo assembly.

Blast analysis showed that twelve contigs, ranging from 340 to 7594 nucleotides (nts), shared 79–95% nt identities with RNA1 of the isolate M1 of strawberry pallidosis-associated virus (SPaV; *Closteroviridae*, *Crinivirus*) (NC_005895) from Maryland, USA, and eight contigs, ranging from 426 to 3296 nts, shared 84–99% nt identities with the M1 RNA2 (NC_005896). The largest assembled contigs of RNA1 (7594 nts; GenBank accession No. OK042926) and RNA2 (3296 nts; OK042927) had 82.4% and 93.7% nt identity with isolate M1, respectively. To confirm the detection of SPaV, total RNA was isolated from sample P1F using a silica-capture method and RT-PCR was conducted with specific primer pair SPaV-CPf (5'-ATCTTATCAGCTAGAACAAGGCA-3') and SPaV-CPr (5'-AGGAAAAGGGATGGTTCCTC-3') designed on the RNA2 sequences. The expected 794 bp amplicon was amplified from P1F and 6 out of 12 additional strawberry samples. The

amplicons from two samples, PM2 and SSA2, were cloned and sequenced (MZ130323 and MZ130324). The sequences of PM2 and SSA2 shared 92.7% nt identity together, 93.3–99.8% and 93.1–98.4% with the two corresponding RNA2 contigs from P1F, and 98.4–93.1% with the SPaV-M1 isolate, respectively. SPaV was first found in the USA (Tzanetakis et al. 2004) and has subsequently been found in other countries (Tzanetakis et al. 2013; Ding et al. 2017). To our knowledge, this is the first report of SPaV infecting strawberries in Iran.

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Declarations

Ethical approval This article does not contain any studies with human participants or animals performed by the author.

Conflict of interest The authors declare that there is no conflict of interest.

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