First report of tomato brown rugose fruit virus in tomato in Albania

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During the past years, tomato production in Albania showed a significant growth with the total acreage in 2019 reaching 6663 ha (FAO 2020). In October 2021, greenhouse tomato crops (unknown hybrid) in Fier and Berat regions in Albania, showed discoloration, mosaic and narrowing of upper leaf blades (Luria et al. 2017). The fruits of affected plants showed brown necrotic spots and wrinkled skin with an incidence of 15–20%. These symptoms resemble those caused by tomato brown rugose fruit virus (ToBRFV). Therefore, samples from ten symptomatic and five asymptomatic plants from each region were collected and tested for the presence of ToBRFV by reverse transcription (RT)-PCR using the primer set ToBRFV-F7/ToBRFV-R7 (Salem et al. 2020), which amplifies a 689 bp fragment of the movement and the coat protein genes. ToBRFV was identified in all symptomatic but not in the asymptomatic plants. Two randomly selected isolates (namely ToBRFV-AI-F and ToBRFV-AI-B, one from each geographic region) were chosen for Sanger sequencing and subsequent BlastN analysis revealed over 99% nucleotide identity of both sequences (accession numbers OL763429 and OL763428) with isolates from Greece (MN815773), the Netherlands (MN882064), Turkey (MT118666), Israel (KX619418) and Mexico (MK319944).

Furthermore, six *Nicotiana glutinosa* plants (3 plants per isolate) were inoculated with leaf extracts of isolates ‘ToBRFV-AI-F’ and ‘ToBRFV-AI-B’. Three days post inoculation, local necrotic lesions developed on inoculated leaves indicative of a tobamovirus infection. Leaf tissue from all symptomatic *N. glutinosa* plants tested positive for ToBRFV in RT-PCR using the same primers. To our knowledge, this is the first report of ToBRFV in tomato in Albania.

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Declarations

Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

References

- FAO (2020) <http://www.fao.org/faostat/en/#data/QC>, Last update: December 22, 2020
- Luria N, Smith E, Reingold V, Bekelman I, Lapidot M, Levin I, Elad N, Tam Y, Sela N, Abu-Ras A, Ezra N, Haberman A, Yitzhak L, Lachman O, Dombrovsky A (2017) A new Israeli tobamovirus isolate infects tomato plants harboring Tm-22 resistance genes. *PLoS One* 12(1):e0170429
- Salem NM, Cao MJ, Odeh S, Turina M, Tahzima R (2020) First report of tobacco mild green mosaic virus and tomato brown rugose fruit virus infecting *Capsicum annuum* in Jordan. *Plant Dis* 104:601

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