New Disease Reports

First report of natural infection of grapevine (*Vitis vinifera*) by *Citrus yellow vein clearing virus*

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The origin of grapevine (*Vitis vinifera*) domestication includes the area currently occupied by Georgia and Turkey, and the oldest seeds of wild grapevine have been excavated in Turkey (This *et al*., 2006). The species is well distributed in both cultivated and wild forms in the country. During surveys in Adana Province in southern Turkey during 2018 and 2019, five wild grapevines exhibiting leaf necrosis, small leaves and shortened internodes, were found climbing citrus trees which exhibited typical symptoms of yellow vein clearing disease. The citrus trees tested positive for the insect-transmitted *Citrus yellow vein clearing virus* (CYVCV), the causal agent of the disease (Önelge *et al*., 2011; Zhang *et al*., 2018; Zhang *et al*., 2019).

To investigate if the grapevines were infected with CYVCV, one cutting was sampled from each of the wild grapevines and total nucleic acid was extracted from phloem tissues using CTAB buffer. Complementary DNA was reverse transcribed from the nucleic acid using random hexamer primers. An upstream (5′ TACCGCAGCTATCCATTTCC-3′) and downstream primer (5′-GCAGAAATCCCGAACCACTA-3′) designed from the coat protein region of CYVCV (Chen *et al*., 2014) were used in PCR to amplify a 614 bp product. PCR products were electrophoresed on an agarose gel and stained with ethidium bromide. Two of the five samples were positive. The amplicon of one positive sample was Sanger sequenced and deposited in GenBank (Accession No. MT501518). A BLAST search showed that the sequence had 98% nucleotide identity with CYVCV isolate Y1 (JX040635).

To demonstrate the ability of CYVCV to infect grapevine, four virus-free grapevine plantlets (cv. Cardinal) grown from tissue culture were mechanically inoculated with infected sap in 0.1 M sodium phosphate buffer using the stem slash method. Another plantlet was inoculated only with phosphate buffer and served as a negative control. The plantlets were placed in an insect-proof greenhouse at 20-25°C. Six months after inoculation, all plants except the negative control exhibited symptoms including short internodes, leaf necrosis and chlorosis, and reduced leaf size (Figs. 1-2). Analysis of the young leaves by RT-PCR confirmed the presence of CYVCV.

To the best of our knowledge, this is the first report of CYVCV infection in grapevine.

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References

1. Chen HM, Li ZA, Wang XF, Zhou Y, Tang KZ, Zhou CY, Zhao XY, Yue JQ, 2014. First report of *Citrus yellow vein clearing virus* on lemon in Yunnan, China. *Plant Disease* **98**, 1747. http://dx.doi.org/10.1094/PDIS-04-14-0343-PDN
2. Önelge N, Satar S, Elibüyük Ö, Bozan O, Kamberoğlu M, 2011. Transmission studies on *Citrus yellow vein clearing virus*. In: International Organization of Citrus Virologists Conference Proceedings (1957-2010). Riverside, USA: 18. https://escholarship.org/uc/item/4134f1xr/. Accessed 10 June 2020.
3. This P, Lacombe T, Thomas MR, 2006. Historical origins and genetic diversity of wine grapes. *Trends in Genetics* **22**, 511-519. http://dx.doi.org/10.1016/j.tig.2006.07.008
4. Zhang YH, Liu CH, Wang Q, Wang YL, Zhou CY, Zhou Y, 2019. Identification of *Dialeurodes citri* as a vector of *Citrus yellow vein clearing virus* in China. *Plant Disease* **103**, 65-68. http://dx.doi.org/10.1094/PDIS-05-18-0911-RE
5. Zhang Y, Wang Y, Wang Q, Cao M, Zhou C, Zhou Y, 2018. Identification of *Aphis spiraecola* as a vector of *Citrus yellow vein clearing virus*. *European Journal of Plant Pathology* **152**, 841-844. http://dx.doi.org/10.1007/s10658-018-1523-7

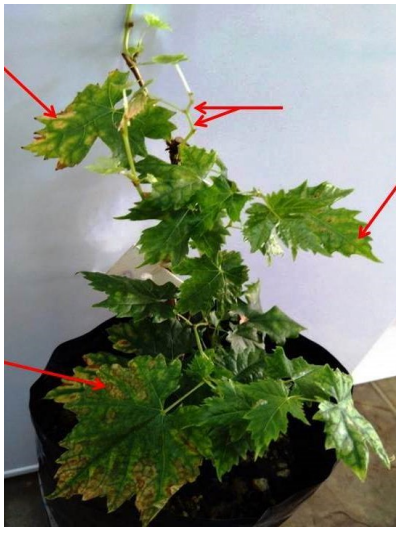

Figure 1

Figure 2

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