The first report of onion yellow dwarf virus infecting onion (*Allium cepa*) in Ethiopia

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Onion (Allium cepa) is an economically important vegetable crop grown worldwide including Ethiopia. In 2013, leaf samples (n=43) with distinctive virus symptoms including dwarfing, uneven yellow striping and crinkling were collected from farmers' fields in East Shewa zone in Ethiopia and analyzed at BecA-ILRI Hub laboratory, Nairobi, Kenya. RNA was extracted using ZR Plant RNA MiniPrep kit (Zymo Research, USA) followed by cDNA synthesis with Maxima First strand cDNA synthesis kit (Thermo Scientific, USA). AccuPower Ready to use PCR PreMix (Bioneer, USA) was used for PCR amplification in a reaction volume of 20 µl. When the samples were initially screened by reverse transcriptase PCR with potyvirus-specific primers NIb2F (5′-GTITGYGTIGAYGAYTTYAAYAA-3′) and NIb3R (5′-TCIACIACIGTIGAIGGYTGNCC-3′) (Zheng et al. 2010), 10 of them gave expected product size (~350 bp). Sanger sequencing at BecA-ILRI Hub Segolip unit and BLAST analysis of the sequences (OP882302 – OP882306) revealed 97–99% nucleotide identity with onion yellow dwarf virus (OYDV) isolates infecting garlic and onion. Furthermore, when the 10 potyvirus-positive samples were subjected to reverse transcriptase PCR with specific primers targeting the three known Allium-infecting potyviruses namely OYDV, leek yellow stripe virus, and shallot yellow stripe virus, only OYDV-specific primers, OYDVF (5'-ATAGCAGAAACAGCTCTTA-3') and OYDV-R (5'-GTCTCYGTAATTCACGC-3') (Arya et al. 2006) gave specific products for all of them suggesting the samples are only infected with OYDV. Sanger sequencing of PCR products from five of the samples followed by pairwise sequence comparison and phylogenetic analysis using the MaximumLikelihood method showed that the OYDV isolates infecting onion from Ethiopia clustered together with Ethiopian garlic-infecting OYDV isolates previously reported by Abraham et al (2019) with 91–99% nucleotide identity among themselves. The results indicated that similar to its high incidence earlier reported on vegetatively-propagated garlic in Ethiopia, OYDV commonly occurs on onion, a crop mainly propagated by true seeds.

Data Availability

The sequence data generated in this study is available as the GenBank accession number OP882302 – OP882306.

Declarations Conflict of Interest

The authors declare no conflicts of interest.

Reference

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