New Disease Reports

New record of bipartite *Squash leaf curl China virus* (SLCCNV) and *Croton yellow vein mosaic* beta satellite associated with yellow vein disease of ash gourd in India

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Received: *11 Dec 2014.* ***Published:*** *01 Feb 2015.* ***Keywords:*** *begomovirus, viral plant disease*

Benincasa hispida commonly known as winter melon or ash gourd is the only member of its genus belonging to the family Cucurbitaceae. It is one of the most commercially important vegetable crops cultivated in the Indian subcontinent, especially in the state of Tamil Nadu, where leaf curl disease of this plant has become a serious problem recently. Infected leaf samples were collected from the field, virions were partially purified (Honda *et al.,* 1983) and confirmed using HR-TEM (Fig. 1). Rolling circle amplification (RCA) (TempliPhi kit, GE healthcare, UK) was carried out and was followed with *Bam*HI and *Hind*III restriction digestions. The amplified DNA-A fragments (2739 nt, GenBank Accession No. KF188433) consisted of 8 open reading frames (ORFs), whereas the amplified DNA-B (2683 nt, KJ004521) had two ORFs. Both DNA-A and DNA-B components were cloned and sequenced. The sequence data revealed 98% sequence identity to DNA-A (AY184487) and 93% sequence identity to DNA-B (AY184488) components of *SLCCNV-India* [India: Coimbatore: Pumpkin]. The β-satellite component (~1.3 kb) was amplified by PCR (Fig. 2) using specific primers (Briddon *et al.,* 2003) and the sequence (KM588256) was found to be 88% identical to CYVMV leaf curl βC1 strain.

A phylogenetic tree was drawn using the neighbour-joining method (MEGA version 6; Tamura *et al*., 2011) with a bootstrap value of 1000 replicates. DNA-β of CYVMV from *B. hispida* plants collected from the Perambalur district of Tamil Nadu was placed in an outlying group in this phylogram (Fig. 3). This is the first report from India on the incidence of old world bipartite *Begomovirus* SLCCNV-IN KP1 infection in combination with DNA-β of CYVMV in *B. hispida*. The frequency of new SLCCNV strains emerging in several agricultural crops and non-crop species indicate that the virus species may have undergone pathogen reassortment with diverse virulent strains as a long-term event and thus pose a serious threat to vegetable cultivation, particularly in the Indian subcontinent.

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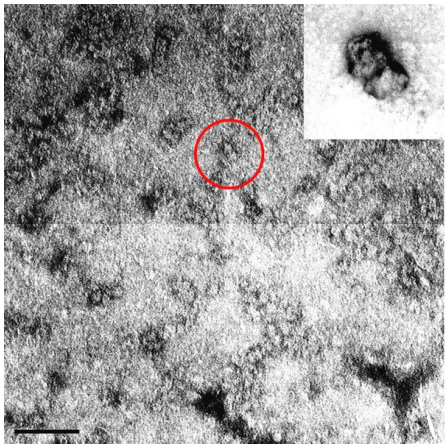

Figure 1

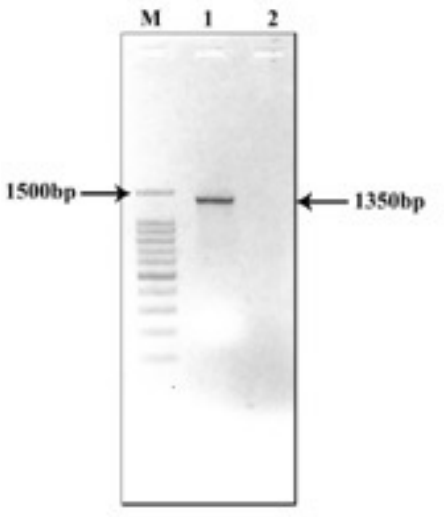

Figure 2

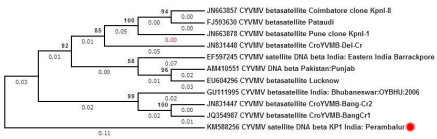

Figure 3

To cite this report: Mohammed Riyaz SU, Deepan S, Jesse MI, Dharanivasan G, Kathiravan K, 2015. New record of bipartite *Squash leaf curl China virus* (SLCCNV) and *Croton yellow vein mosaic* beta satellite associated with yellow vein disease of ash gourd in India. *New Disease Reports* **31**, 3. http://dx.doi.org/10.5197/j.2044-0588.2015.031.003

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