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First Report of Tomato Leaf Curl Joydebpur Virus Infecting Chilli (*Capsicum annuum*) in Andaman and Nicobar Islands

N. Krishnan, S. Kumari, S. Krishnan, V. Dubey, A. K. Singh, and R. Kumar

Affiliations

Authors and Affiliations

N. Krishnan[1 †]
S. Kumari[1]
S. Krishnan[2]
V. Dubey[1]
A. K. Singh[3]
R. Kumar[3]

[1]Division of Crop Protection, ICAR - Indian Institute of Vegetable Research, Varanasi 221305, Uttar Pradesh, India

[2]ICAR - Central Island Agricultural Research Institute, Port Blair 744101, Andaman and Nicobar Islands, India

[3]Division of Crop Improvement, ICAR - Indian Institute of Vegetable Research, Varanasi 221305, Uttar Pradesh, India

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Chilli (*Capsicum annuum* L.), family Solanaceae, is cultivated and consumed as both vegetable and spice in Andaman and Nicobar Islands (11°35′52″N, 92°39′27″E) of India. Chilli leaf curl disease (ChiLCD) caused by begomovirus infections is a major constraint in mainland India (**Kumar et al. 2015**) and it also causes severe yield loss in island conditions. There has been no study demonstrating etiology of ChiLCD in Andaman and Nicobar Islands. During 2017, a survey was conducted at six different locations in Andaman and Nicobar Islands on leaf curl diseases of chillies. Symptoms such as mild to severe curling of leaves, reduction of leaf size, stunting of plant growth, clearing of veins and veinlets, thickening of leaves, enations, and chlorosis were observed on infected plants of all crop growth stages with incidence ranging from 35 to 68%. When seedlings became infected, the

plants failed to produce fruits. Leaf samples from 15 symptomatic and three asymptomatic plants collected from six different locations in the islands were first tested for begomovirus infection using an antiserum specific to squash leaf curl virus (SLCV) (DSMZ, Germany) in a dot immuno binding assay (DIBA). Thirteen out of 15 symptomatic samples showed positive reaction for begomovirus infection. To further characterize the virus identity, total DNA isolated by the CTAB method (**Doyle and Doyle 1990**) from the symptomatic and asymptomatic samples were tested using a PCR assay with modified DNA-A specific universal primers, PAL1c1960: 5′-ACNGGNAARACNATGTGGGC-3′ and PAR1v722: 5′-GGNAARATHTGGATGGA-3′, amplifying ~1,200 bp of DNA-A (**Chatchawankanphanich and Maxwell 2002**). All samples that tested positive in DIBA were also positive in the PCR assays. Nucleotide sequences of amplicons from eight samples showed 98% identity with Begomovirus species *Tomato leaf curl Joydebpur virus* (ToLCJoV) from Bangladesh and mainland India in BLAST analysis. DNA from one positive sample was subjected to rolling circle amplification (**Haible et al. 2006**) followed by RFLP analysis for complete genome characterization. Upon digestion with *Bam*HI and *Hind*III, fragments of ~2.7 kb were cloned and four clones were completely sequenced by primer walking. All four sequences shared 99% identity with each other and the consensus sequence of 2,761 nt long was submitted to GenBank (accession no. MK330665). The sequence exhibited 98.23% nucleotide identity with the DNA-A like genome sequence of ToLCJoV isolate (GenBank accession no. AJ875159) from Bangladesh infecting tomato. PCR assays using a specific primer pair targeting DNA B of begomoviruses (**Venkataravanappa et al. 2012**) could not provide evidence for the involvement of DNA B. Further PCR assays with the Beta01/02 primer pair (**Briddon et al. 2002**) followed by sequencing (GenBank accession no. MN066162) confirmed the association of tomato leaf curl Joydebpur betasatellite (ToLCJoB) sharing 96.79% identity with GenBank accession no. JN176566. Previous studies demonstrated that begomovirus ToLCJoV was associated with leaf curl on chillies, tomato, and kenaf in mainland India (**Paul et al. 2009**; **Shih et al. 2007**; **Tiwari et al. 2013**). The present study confirms the infection of monopartite ToLCJoV in chilli plants affected by ChiLCD in Andaman and Nicobar Islands for the first time. ToLCJoV may expand its host range to other crops of the islands similar to the hosts that it infects in mainland India.

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The American Phytopathological Society

(APS)

3340 Pilot Knob Road, St. Paul, MN 55121 USA

+1.651.454.7250

FAX +1.651.454.0766

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