

## Novel Recombinant Betasatellite Associated with Vein Thickening Symptoms on Okra Plants in Saudi Arabia

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**Abstract :** Betasatellites are small circular single stranded DNA molecules found associated with begomoviruses on field symptomatic plants. Their genome size is about half that of the helper begomovirus, ranging between 1.3 and 1.4 kb. The helper begomoviruses are usually members of the family Geminiviridae. Okra leaves showing vein thickening were collected from okra plants growing in Jazan, Saudi Arabia. Total DNA was extracted from leaves and used as a template to amplify circular DNA using rolling circle amplification (RCA) technology. Products were digested with PstI to linearize the helper viral genome(s), and associated DNA satellite(s), yielding a 2.8kbp and 1.4kbp fragment, respectively. The linearized fragments were cloned into the pGEM-5Zf (+) vector and subjected to DNA sequencing. The 2.8 kb fragment was identified as Cotton leaf curl Gezira virus genome, at 2780bp, an isolate closely related to strains reported previously from Saudi Arabia. A clone obtained from the 1.4 kb fragments he 1.4kb was blasted to GeneBank database found to be a betasatellite. The genome of betasatellite was 1357-bp in size. It was found to be a recombinant containing one fragment (877-bp) that shared 91% nt identity with Cotton leaf curl Gezira betasatellite [KM279620], and a smaller fragment [133--bp] that shared 86% nt identity with Tomato leaf curl Sudan virus [JX483708]. This satellite is thus a recombinant between a malvaceous-infecting satellite and a solanaceous-infecting begomovirus.

**Keywords :** begomovirus, betasatellites, cotton leaf curl Gezira virus, okra plants

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