Citrus bent leaf viroid

ABSTRACT

Citrus bent leaf viroid (CBLVd) from genus Apscaviroid, is one of the widely distributed viroids among the seven citrus viroids. It is comprised of three variants: Citrus viroid-Ia (CVd-Ia) (327 - 329 nucleotides), Citrus viroid-Ib (CVd-Ib) (315 - 319 nucleotides) and Citrus viroid-I-low sequence similarity (CVd-I-LSS) (325 - 330 nucleotides). Virulence of CBLVd totally expressed on citrus plants. Etrog citron (Citrus medica (L.)) coinfected with CBLVd, Citrus exocortis viroid (CEVd), Citrus viroid-III (CVd-III) and Citrus viroid-V (CVd-V) showed epinasty, leaf rolling, and stunting. CBLVd has been reported to reduce the canopy proportion and fruit production of citrus trees inserted on trifoliate orange rootstock. Moreover, citrus tree infected with singly CBLVd or in combinations with CEVd, Hop stunt viroid (CVd-II) and CVd-III induced dwarfing have been associated with poor development of the root system. Reverse-transcriptase polymerase chain reaction (RT-PCR) amplification and multiplex reverse-transcriptase polymerase chain reaction (MRT-PCR) amplification have been widely used to detect citrus viroids including CBLVd. As citrus viroids are emerging threats in citrus groves, therefore, this review covers the evolution, geographical distribution and epidemiology, economic impact and symptomatology, host range and transmission, detection, and management will be helpful in formulating the integrated management strategies for CBLVd.

Keyword: CBLVd; Citrus; MRT-PCR; RT-PCR; Viroids