

## First report of citrus bent leaf viroid in Malaysia

### ABSTRACT

Leaf samples of citrus species such as calamondin (*Citrofortunella microcarpa*), kaffir lime (*Citrus hystrix*), key lime (*Citrus aurantifolia* [*C. aurantiifolia*]), mandarin orange (*Citrus reticulata*), pomelo (*Citrus maxima*) and sweet orange (*Citrus sinensis*) with stunting, leaf yellowing and epinasty were collected from different states in Malaysia. The rootstocks of these samples were not known. Total nucleic acids were extracted from leaves around the tree canopy and tested by RT-PCR with two sets of primers, CBLV-CM/ CBLV-CP and the newly designed YI4F/YI4R. Altogether, 21 of 133 citrus samples were positive for Citrus bent leaf viroid (CBLVd). The resulting amplicons of 328 bp and 234 bp in size were cloned. Sequence analysis revealed 95-99% identity with CBLVd isolate Jp (accession No. AB006734), confirming the presence of CBLVd (KU194472, KX823338-KX823343) in the tested samples. No particular symptoms were observed in the test samples correlated with the presence of CBLVd, thus the observed symptoms may not be induced by this viroid. This is thought to be the first report of CBLVd in Malaysia.

**Keyword:** Leaf; Citrus; Bent leaf viroid; Malaysia