EPPO Datasheet: *Begomovirus cucurbitapeponis*

Last updated: 2023-11-20

IDENTITY

Preferred name: *Begomovirus cucurbitapeponis*
Taxonomic position: Viruses and viroids: Monodnaviria: Shotokuvirae: Cressdnaviricota: Repensiviricetes: Geplafuvirales: Geminiviridae
Other scientific names: *SLCV, SLCuV, Squash leaf curl begomovirus, Squash leaf curl bigeminivirus, Squash leaf curl geminivirus, Squash leaf curl virus*
Common names: curly mottle of watermelon, leaf curl of melon, leaf curl of squash, necrotic mosaic of melon
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EPPO Categorization: A2 list
view more categorizations online...
EPPO Code: SLCV00


more photos...

Notes on taxonomy and nomenclature

There are uncertainties on the synonymy of *Squash leaf curl virus* with *Watermelon curly mottle virus* (WCMoV), a whitefly transmitted begomovirus initially reported on watermelon in Arizona (USA) in 1986 (Brown & Nelson, 1986, 1989) and *Melon leaf curl virus* (MLCV) described in melon in California (USA) in 1985, (CABI, 2023). ICTV downgraded *Watermelon curly mottle virus* and *Melon leaf curl virus* from species to tentative species (ICTV, 2023). WCMoV and MLCV are not covered by this datasheet.

This datasheet does not cover *Squash leaf curl Philippines virus* and *Squash leaf curl China* virus which are different species (ICTV, 2023).

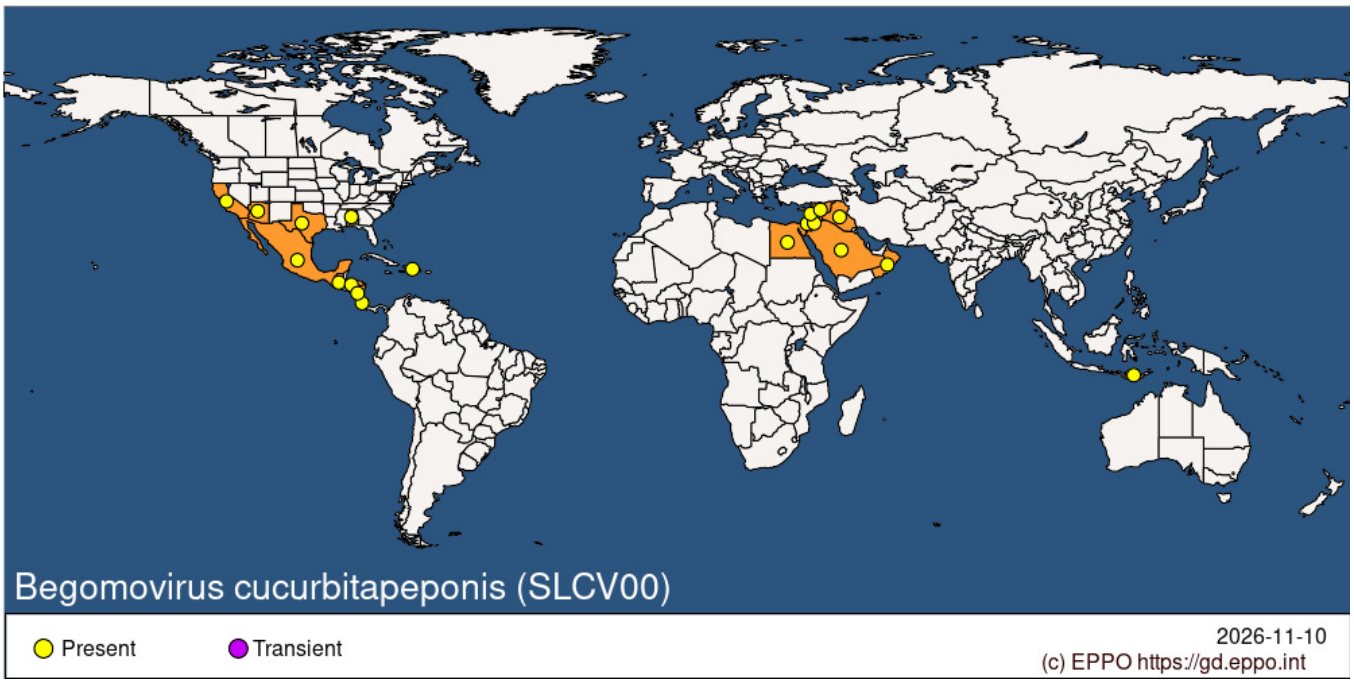
HOSTS

The original strain of the virus (SLCV-CA) was reported in California (USA) damaging crops of *Cucurbita maxima* and other cucurbits. The host range of SLCV includes all major crops of the family Cucurbitaceae including *Cucumis sativus* (cucumbers), *Cucumis melo* (melons), *Citrullus lanatus* (watermelons). The virus has also been reported infecting three Solanaceae crops (tomato, pepper and eggplant) and cotton. SLCV has also been reported from a few wild *Cucurbita* spp., native Cactaceae and weeds from various families (Anfoka *et al*., 2017; Fontenele *et al*., 2021).

Host list: *Capsicum annuum, Chenopodiastrum murale, Citrullus lanatus, Convolvulus sp., Cucumis melo, Cucumis sativus, Cucurbita maxima, Cucurbita moschata, Cucurbita pepo, Cylindropuntia whipplei, Ecballium elaterium, Ferocactus acanthodes, Gossypium, Malva neglecta, Malva nicaeensis, Malva parviflora, Opuntia atrispina, Opuntia basilaris, Opuntia caracassana, Opuntia robusta, Opuntia, Pereskiopsis kellermanii, Phaseolus vulgaris, Physalis ixocarpa, Proboscidea louisianica, Prosopis farcta, Raphanus sativus, Sinapis arvensis, Solanum lycopersicum, Solanum melongena*

GEOGRAPHICAL DISTRIBUTION

Squash leaf curl virus was initially identified in the USA in the 1970s and in 2002 the virus was reported for the first time outside the New World in Israel, and then spread to other countries in the Near East (Lapidot *et al*., 2014).



EPPO Region: Israel, Jordan
Africa: Egypt
Asia: Indonesia (Nusa Tenggara), Iraq, Israel, Jordan, Lebanon, Oman, Saudi Arabia, Syrian Arab Republic
North America: Mexico, United States of America (Alabama, Arizona, California, Texas)
Central America and Caribbean: Costa Rica, Dominican Republic, Guatemala, Honduras, Nicaragua

BIOLOGY

SLCV is transmitted in a persistent manner by *Bemisia tabaci*, especially MEAM1 species (Middle East-Asia Minor, formerly known as biotype B). Viruliferous whiteflies can retain the virus for 26 days (Cohen *et al*., 1983). It is not transmitted by mechanical inoculation.

There are no reports of seed transmission.

DETECTION AND IDENTIFICATION

Symptoms

SLCV causes severe leaf curling thickened leaf vein-banding and mild chlorosis and leaf malformation. Fruits of infected plants are usually unmarketable.

Morphology

SLCV has geminate particles, 22 x 38 nm in size (Cohen *et al*., 1983). The virus is associated with maturing phloem sieve tube elements (Hoefert, 1987).

Detection and inspection methods

ELISA is a simple and reliable method used to detect SLCV (Farag *et al.*, 2011; McCreight & Kishaba, 1991). The virus can also be detected by PCR in DNA obtained from infected plants. An EPPO Diagnostic Protocol for Begomoviruses covers detection and/or identification of SLCV (EPPO Standard PM 7/152, EPPO 2022).

PATHWAYS FOR MOVEMENT

SLCV moves only in its vector *B. tabaci*, which can spread it between fields and glasshouses in infested areas. In international trade, it is very unlikely to be carried by plants of its main cultivated hosts, since these are short-lived vegetable crops not normally moved except as seedlings. Young seedlings for transplanting might constitute a pathway for spread within the EPPO region. The vegetables as such are not likely to carry *B. tabaci*. So, the main risk of movement is in *B. tabaci* on alternative host plants (e.g., ornamentals), given the fact that the vector moves readily from one host to another, and that the virus can persist in the vector for several weeks after acquisition. Seed is not a pathway as no seed transmission has been reported for SCLV.

PEST SIGNIFICANCE

Economic impact

SLCV has caused severe losses of squashes, melons and related cucurbits in Arizona, California and Texas (USA) (Duffus & Flock, 1982; Isakeit *et al*., 1994; Kuo et al., 2007; Nameth *et al*., 1985) as well as in Mexico (Vargas-Salinas *et al*., 2020). In a study conducted in Israel, Sufrin-Ringwald & Lapidot showed that dual infection of melon plants with SLCV and Watermelon chlorotic stunt virus (WmCSV) caused yield reduction of 54% (Sufrin-Ringwald & Lapidot, 2010). In Egypt, Idris *et al*. (2006) reported that SLCV caused severe symptoms in pumpkin crops (*Cucurbita pepo*). The virus was reported to cause 23% yield reduction in beans (*Phaseolus vulgaris*) when plants were infected at early growth stages by SLCV (Farrag *et al*., 2014).

Control

Together with the rational use of systemic insecticides to control the vector, planting SLCV-resistant plants is the most effective way to reduce disease incidence. However, cucurbit hybrids resistant to the virus are still not available, therefore, cultural practices that can reduce *B. tabaci* population should be followed by farmers to reduce yield losses caused by SLCV. These practices include removing overwintering crops early in the season prior to the emergence of adult whiteflies, destroying weeds that may act as alternative hosts for *B. tabaci*, covering the soil with a mulch of sawdust, fresh wheat straw or yellow polyethylene sheets and growing plants under physical barriers, such as low mesh tunnels and shade-cloth.

Phytosanitary risk

SLCV presents a threat to the cultivation of cucurbits (especially courgette, melon, squash and watermelon), in the southern part of the EPPO region as well as under glass in the northern part, wherever *B. tabaci* occurs. It has established in some countries in the Near East and may further established in other EPPO countries.

PHYTOSANITARY MEASURES

Host plants for planting should only be imported from pest-free areas for the virus. They may also come from areas where the virus occurs if they are produced in pest-free sites of production e.g. under isolation or where measures are implemented to avoid the presence of *B. tabaci* (e.g. green/screenhouses, trapping) and no symptoms of the virus are observed during the cycle of vegetation. Surveillance (visual inspection followed by laboratory testing) contributes to early detection of SLCV infected plants and assessment of vectors for targeted insecticide application.

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Datasheet history

This datasheet was first published in 1997 in the second edition of 'Quarantine Pests for Europe', and revised in 2023. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', 'Hosts', and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

CABI/EPPO (1997) *Quarantine Pests for Europe (2nd edition)*. CABI, Wallingford (GB).

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