

Title:

Betasatellites associated geminivirus diseases, a risk for vegetable crops in the Mediterranean area

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Abstract body text:

Some plant viruses are frequently associated with satellite molecules. Their infectious cycle depends on the so-called helper virus for replication, encapsidation, or transmission. Some of these molecules increase severity of viral symptoms and agronomic yield losses. Geminiviruses (family Geminiviridae) are among the most damaging viruses because they affect various important industrial and food crops including cotton, maize, cassava and vegetables crops (tomato, cucurbits). Begomovirus, the largest geminivirus genus comprises more than 300 viral species, which can be associated with satellites of three types, i.e. alphasatellites, betasatellites or deltasatellites. Whereas alphasatellites and deltasatellites are mostly harmless, betasatellites often increase viral symptoms and reduce yields dramatically. Betasatellite, widely distributed in Asia, the Middle East, and Africa, are now reported at the Eastern and Southern doorstep of the Mediterranean Basin. Their spread to new producing areas is matter of concern because all begomovirus species tested so far can be helper of different betasatellites and particularly begomoviruses reported in the Mediterranean, i.e., tomato yellow leaf curl virus (TYLCV) and tomato leaf curl New Dehli virus. The recent invasion of betasatellites in TYLCV infected tomato crops of Israel and Jordan and the fact that the invaded betasatellite can overcome the previously selected plant resistance to TYLCV is an example of the disaster that threaten this region. Moreover, the intensive production of vegetables in this region with year round crops is thought to be conducive for their adaptation and maintenance in this new environment.

The main objective of our project is to check the presence /absence of betasatellite in the western part of the Mediterranean Basin and identify the main drivers of their installation, their ecology and interactions with plants and geminiviruses.

Keywords: Begomovirus, DNA satellites, tomato, interactions