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Whitefly Transmitted Begomoviruses in Asia and their Impact on Europe

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Abstract

Viruses circulatively transmitted by the whitefly *Bemisia tabaci*, the begomoviruses, infect a variety of important vegetable and agricultural crops worldwide and cause serious yield losses especially in tropical and subtropical regions. They present an increasing threat to crop production because of the emergence of more competitive begomovirus species and strains and the very intense international movement of plant materials which brings new viruses and / or new cryptic species of insect vectors transmitting viruses into new environments.

In warm climates around the world, *B. tabaci* insects are of concern because of virus spread but also because more invasive *B. tabaci* species introduced from other regions can be more efficient to transmit viruses or, display other features like resistance to insecticides or, a better adaptation to crops and environment. Likewise, the introduction of new viruses in a region can jeopardise existing measures of virus control and crop management.

The BMZ/GIZ project "Beating Begomoviruses: Better livelihoods for farmers in tropical Asia" concentrates on begomoviruses, *B. tabaci* and sustainable strategies to reduce impact of the diseases in tomato, hot peppers and mungbean. A diversity study was conducted, to identify the predominant species of viruses and their vector whiteflies in Vietnam, Thailand and India and to implement this in a screening of newly developed cultivars to identify virus resistance. In all countries, the diversity of begomovirus was considerably high. Interestingly while several virus outbreaks are attributed to infestations with the *B. tabaci* cryptic species MEAM1/Med, presence of these invasive whitefly species, albeit earlier reported, was not confirmed in India or in Thailand. Only in Vietnam an invasion of *B. tabaci* MEAM1 in northern Vietnam with North-South direction was found which probably originates in China. The results from the studies will be discussed in light of the increasing problems of whitefly transmitted viruses in crop production in Europe.

Keywords: Begomovirus, *Bemisia tabaci*, climate change, resistance screening

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