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## Increasing risks for the expansion of *Brevipalpus*-transmitted viruses under global warming conditions

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Several plant diseases characterized by localized lesions on plant organs are currently attributed to viruses transmitted by *Brevipalpus* mites (Acari: Tenuipalpidae) (BTV). Citrus leprosis is by large the best known and most important economically of such diseases, but others as coffee ringspot, orchid fleck and passion fruit green spot also cause yield losses. Additionally, many ornamentals were found to be susceptible to BTV either naturally or experimentally. So far only three *Brevipalpus* species have been identified as vectors for BTV, respectively *B. phoenicis sensu lato, B. obovatus* and *B. californicus.* These species have worldwide distribution mostly in tropical and subtropical regions. Global warming may increase the area of distribution of these mites as well as of the diseases they transmit. Furthermore, these risks are amplified because of the ever-increasing world trade of plants, especially ornamentals. In addition, many of these plants host BTV and *Brevipalpus* and may act as Troyan horse, introducing the above-mentioned diseases into presently disease-free regions. Efficient BTV and *Brevipalpus* spp. detection protocols in the quarantine services would be required to minimize such a risk.

## Climate change alters biogeography of spider mites and their natural enemies: consequences for biological control and food production

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Climate change influences the ecology and distribution of crops, pests and their natural enemies with potentially important consequences for food production and safety. To better understand climate change effects on agricultural ecosystems we investigated the impacts of changing conditions on a crop-pest-natural enemy system of global importance: tomato (*Solanum lycopersicum*), the two-spotted spider mite (*Tetranychus urticae*) and two key predators, *Neoseiulus californicus* and *Phytoseiulus persimilis*. We modelled the suitability of future climate for the four species using the CLIMEX model, which combines data on climate and species biology to calculate the Ecoclimatic Index, a measure of the potential for population growth. Data under two IPCC SRES climate change scenarios (A1B, A2) and two General Circulation Models (CSIRO MK3.0 and MIROC-H) for 2030, 2050 and 2070 were used for the projections. The results of the study suggest that in the near future, the climatic conditions at high latitudes in Europe, Asia and America as well as in hot and arid Mediterranean regions and areas in the tropics and sub-tropics, will become marginal for the maintenance of viable predator populations in contrast to populations of *T. urticae,* which are projected to be vigorous. Consequently, climate change is expected to negatively affect biological control of *T. urticae* in large swaths of agricultural land. Moreover, climate change is expected to shift outdoor tomato production northwards in Europe, a result of combined abiotic and biotic (*T. urticae*) stress. The current study highlights the importance of considering trophic interactions when predicting climate change effects on food production. Further work focuses on validating model projections with field data.

## Biological Invasions in Changing Ecosystems

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