

An overview of *Brevipalpus* mites (Acari: Tenuipalpidae) and the plant viruses they transmit*

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Abstract

The significance of the family Tenuipalpidae has risen from near obscurity to that of considerable economic importance over the last five decades. One or more species within the genera *Brevipalpus*, *Cenopalpus*, *Dolichotetranychus*, *Raoiella*, and *Tenuipalpus* are recognized as serious economic plant pests. However, only three species within the genus *Brevipalpus* are known to vector one or more cytoplasmic or nuclear type plant viruses, including citrus leprosis, coffee ringspot, green spot on passion fruit, and orchid fleck viruses. Related viruses have been identified in numerous ornamental plants that are vectored by *B. phoenicis* and *B. obovatus*. Affected plant species, their current distributions and known mite vectors are summarized in this paper. The life cycle and developmental times for the three *Brevipalpus* species are reviewed. Cryptic species within *B. phoenicis* have been identified on *Hibiscus* in Florida and *Citrus sinensis* in Honduras within recent years. This dictates the need for more intensive research to identify the extent of this species complex throughout the western hemisphere. More stringent guidelines are needed for the inspection and movement of live plant materials that are host plants for *Brevipalpus* mites from one country to another.

Key words: Citrus leprosis, green spot of passion fruit, coffee ringspot, orchid fleck virus, false spider mites, flat mites.

Introduction

The Tenuipalpidae are commonly referred to as false spider mites or flat mites. The significance of this acarine family has risen from near obscurity to that of considerable economic importance over the last five decades. One or more species within the genera *Brevipalpus*, *Cenopalpus*, *Dolichotetranychus*, *Raoiella* and *Tenuipalpus* are recognized as plant pests. However, five species within the genus *Brevipalpus* [*B. californicus* (Banks), *B. chilensis* Baker, *B. lewisi* McGregor, *B. obovatus* Donnadieu and *B. phoenicis* (Geijskes)] and *Raoiella indica* Hirst are currently recognized as the most important economic pests within the family.

Raoiella indica was present in Mauritius, Reunion, Sudan, Egypt, the Middle East, India, Sri Lanka, Thailand and the Philippines prior to its introduction to the Caribbean, Venezuela, Florida and more recently Brazil (Jeppson *et al.*, 1975; Flechtmann & Etienne, 2004; Vásquez *et al.*, 2008; Espinosa & Hodges, 2009; Navia *et al.*, 2011). The mite was first identified in Palm Beach, Florida in 2007. It is a serious pest on coconut and various ornamental palms as well as banana. Its impact has been devastating to the economies of many countries within the Caribbean region (Rodrigues *et al.*, 2010).

Brevipalpus chilensis is currently restricted to Chile where it is a pest on several crops, including grapes and citrus (Jeppson *et al.*, 1975). The mite poses a significant threat to agriculture in many countries as a high risk exotic pest introduction due to its wide host range and destructive potential. The ability of this mite to vector plant viruses is unknown.