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Abstract

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The invasive Lewis spider mite, *Eotetranychus lewisi* (Acari: Tetranychidae), in Europe—current status and associated risk*

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Invasive pests and pathogens are an undesirable consequence of international trade and travel, and often result in significant ecological and economic impacts. In Europe, the number of spider mites (Tetranychidae) is steadily increasing with the arrival of introduced species, most of which have the status of pests. During the last decades two invasive species have occasionally caused major damage to crops in Europe, namely *Tetranychus evansi* and *Oligonychus perseae*.

In Portugal, the recent detection of the invasive Lewis spider mite, *Eotetranychus lewisi,* in the Algarve may represent a new problem to cultivated crops in southern Europe. Worldwide, the most common host of *E. lewisi* is *Euphorbia pulcherrima* (Poinsettia), but the Lewis mite is extremely polyphagous and can feed on more than 75 species from 28 botanical families, including several economically important agricultural crops of the genera *Citrus*, *Carica*, *Fragaria*, *Ficus*, *Olea*, *Prunus*, *Rubus* and *Vitis*. In North and Central America, significant damages, resulting in economic loss, have been recorded on citrus, strawberry, grape vine and peach, among other crops. Considering its polyphagy and possible damages, the Lewis spider mite is classified as a regulated A1 quarantine pest within the European Union.

The Algarve population is the first to establish in outdoor conditions in continental Europe, although *E. lewisi* has been present for more than 30 years in Madeira Island without reports of damages to agricultural crops (which can result from an absence of specific surveys and requires clarification). Both Madeira and the Algarve offer suitable conditions for this mite's development, establishment, spread and economic impact, namely: (1) varied cultivated crops including regionally important plants such as citrus, strawberries and grape vines; (2) diverse, abundant and widespread non-cultivated plants, such as *Euphorbia* and *Ricinus* spp., constituting potential reservoirs for the mite´s breeding and overwintering; and (3) a mild climate, probably favorable for *E. lewisi´*s development considering that modelling analysis suggests that more than 10 generations per year can occur in most of southern Europe.

An ongoing scientific project, comprising researchers from Portugal (INIAV and SRADR) and France (INRAE), has begun to assess this newly established population in the Algarve and critically compare it with the long-established Madeira´s population. The project is based on field surveys to identify the most important plant hosts (including non-cultivated and agricultural plants), and to assess the damages on selected agricultural crops. An initial field survey of plants in Madeira and the Algarve was conducted in May 2022; it comprised 63 species from 36 plant families, including four species of the *Euphorbia* genus and important crops such as citrus, strawberries, grape vine, olive, tomato, and others. We confirmed the presence of breeding populations of *E. lewisi* under outdoor conditions in different locations in Madeira and the Algarve, all of which were associated with cultivated and naturalized Poinsettia plants. The Lewis mite was not found on other plant species adjacent to the infested Poinsettia plants, and was absent from neighboring agricultural crops. Our preliminary results confirm the preference of *E. lewisi* for its main host, Poinsettia, and suggest the mite is not causing damages to locally important crops. To complement this initial assessment, additional field surveys, and future field and laboratory experiments, are programmed for the next months to further clarify the pest status of *E. lewisi* under outdoor conditions in Southern Europe.

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Keywords: Invasive pest, *Eotetranychus lewisi*, *Euphorbia pulcherrima*, Portugal, Tetranychidae

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