

Scientific Note

New records of *Tetranychus evansi* Baker & Pritchard, 1960 (Acari: Tetranychidae) on *Nicotiana* species (Solanaceae)

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Abstract. *Tetranychus evansi* Baker & Pritchard, 1960 (Tetranychidae) is a phytophagous mite with wide distribution and high importance for agriculture. This study reports the occurrence of *T. evansi* in *Nicotiana alata* Link & Otto, *Nicotiana forgetiana* Sander ex W. Watson (Solanaceae) and their putative hybrids in a greenhouse in Rio Grande do Sul state, Brazil. Different stages of development of *T. evansi* were found in *N. alata* and *N. forgetiana* and in their putative hybrids.

Keywords: greenhouse; *Nicotiana alata*; *Nicotiana forgetiana*; spider mites.

The red tomato spider mite *Tetranychus evansi* Baker & Pritchard, 1960 (Tetranychidae) is a widely distributed phytophagous mite, commonly associated with tomato plants (Navajas et al. 2013). This species reported as an invasive agricultural pest, being able to feed on 37 plant families, with the largest number of hosts for Solanaceae plants (Mendonça et al. 2011; Azandémè-Hounmalon et al. 2015; Tian et al. 2019; Migeon & Dorkeld 2022). Thus, many researches emerged, contributing to further insight into possible ways of controlling this spider mite (Navajas et al. 2013; Savi et al 2021; Van de Velde et al 2021).

The genus *Nicotiana* (Solanaceae), composed by herbaceous, shrub and arborescent plants, which are not endemic to Brazil, has a wide distribution in all regions of the country (Stehmann et al. 2015; Vignoli-Silva & Stehmann 2020). Among this genus, the red tomato spider mite has already been recorded in three species: *Nicotiana glauca* Graham, *Nicotiana tabacum* L. and *Nicotiana* sp. (Migeon & Dorkeld 2022). The objective of this work was to report the presence of *T. evansi* associated with *Nicotiana alata* Link & Otto and *Nicotiana forgetiana* Sander ex W. Watson and putative hybrids in a greenhouse in Rio Grande do Sul state.

Nicotiana alata (Fig. 1A) and *N. forgetiana* (Fig. 1B) seeds and putative hybrids of *N. alata* x *N. forgetiana* (Figs. 1C, D, E, F) were collected in Bento Gonçalves and Carlos Barbosa counties, Rio Grande do Sul state, and also in Urubici county, Santa Catarina state throughout the spring of 2019. The material was stored under refrigeration in the Laboratory of Evolution, Chemical Ecology and Chemotaxonomy of the Federal University of Rio Grande do Sul, Porto Alegre, Rio Grande do Sul. Additionally, they were sown in plastic vases with medium vermiculite and soil and kept in greenhouse during whole development.

Mite sampling occurred in March 2022 injured leaves were detached and placed in plastic bags under low temperature in styrofoam boxes with Gelox until they arrived to the Laboratory of Acarology, at University of Vale do Taquari - Univates. The leaves were evaluated using a stereoscopic microscope (Leica S6E) and mites were mounted on glass slides in Hoyer's medium (Jeppson et al. 1975). The slides were kept in a kiln between 50-60°C for approximately seven days for medium drying, fixation, distension, and clarification of specimens.

Morphological identification was performed using a phase contrast microscope (Axio Scope, A1-Zeiss) and a dichotomous key (Baker & Pritchard 1960; Baker & Tuttle 1994).

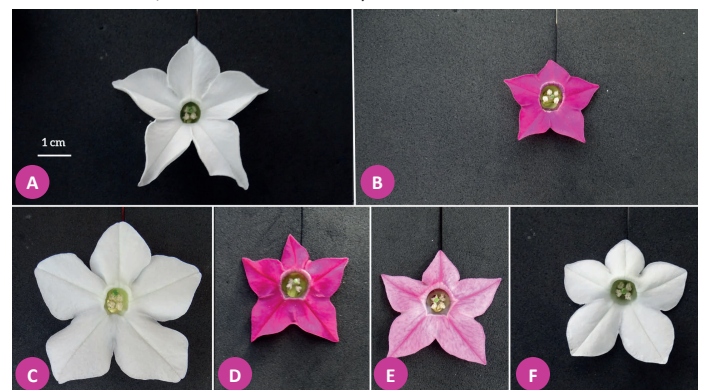


Figure 1. (A): *Nicotiana alata* Link & Otto (Solanaceae); (B): *Nicotiana forgetiana* Sander ex W. Watson (Solanaceae); (C, D, E, F): Putative natural hybrids of *N. alata* x *N. forgetiana* grown in a greenhouse.

Different development stages of *T. evansi* were observed on *N. alata* and *N. forgetiana* leaves and their putative hybrids (Figs. 2C-D). The signs observed were presence of web, leaf irregular stain and browning (Figs. 2A-B). Mite infestation occurred in several vases simultaneously, in plants of different stages of development, including in flowering.

Tetranychus evansi (Figs. 3A-D; 4A-C) was recorded in *N. alata* in the pre-flowering period, where there was a delay in flowering was observed. *Nicotiana forgetiana* in pre-flowering, was affected, presenting a mixed response, with delay in the development of a part of the individuals and normal flowering in the others. Regarding the putative natural hybrids, there were no aggressive response by *T. evansi* infestation if compared to *N. alata* and *N. forgetiana*. Mite infestation was observed on the leaves, but development and flowering were not affected. In general, the damages of *T. evansi* in putative natural hybrids were not as severe as those observed in the parents.



Figure 2. (A): *Nicotiana alata* Link & Otto (Solanaceae) injuries caused by *Tetranychus evansi* Baker & Pritchard, 1960; (B): Leaf injury caused by *Tetranychus evansi*; (C): Female of *Tetranychus evansi*; (D): Male of *Tetranychus evansi*.

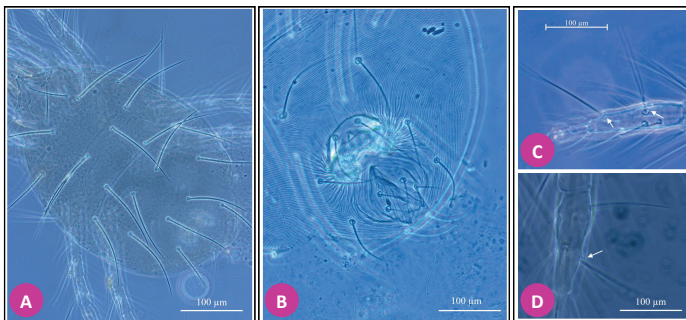


Figure 3. *Tetranychus evansi* Baker & Pritchard, 1960 female: (A): Idiosoma in dorsal view; (B): Anogenital region, in ventral view; (C): Duplex setae of tarsus of leg I; (D): Duplex setae of tarsus of leg II.

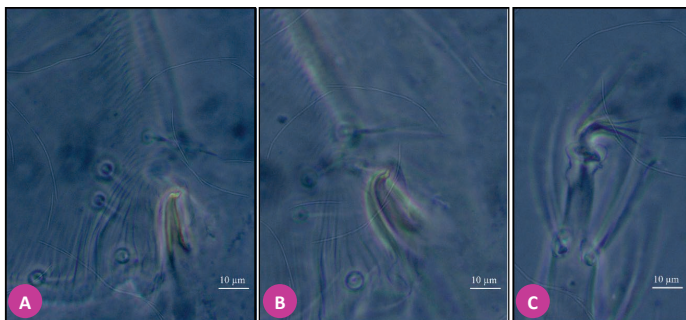


Figure 4. *Tetranychus evansi* Baker & Pritchard, 1960 male: (A, B) Aedeagus; (C): Empodium of leg IV.

This study reports, for the first time, the occurrence of *T. evansi* in *N. alata*, *N. forgetiana* and their putative hybrids in a greenhouse in Rio Grande do Sul state. It might be considered as an alert for further records on these plant species in the field. It is also worth mentioning the presence of *T. evansi* in putative natural hybrids, and that in these the damages were not as severe as those were observed in the parents. Further researches on control methods are needed in order to establish sustainable pest mite control.

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Authors' Contributions

TDC, JJF and NJF examined, confirmed the identification of the mites. TDC and MAMSC performed the study. TDC, MAMSC, JJF, NJF and GLGS wrote the manuscript.

Conflict of Interest Statement

The authors declare that they have no conflict of interest.

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