

Notes and Comments

***Retithrips syriacus* (Mayet) (Thysanoptera: Thripidae): first record damaging cotton plants in Brazil**

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Thrips (Thysanoptera) are dispersed in all regions of the world, but with higher frequency in tropical regions (Kerns et al., 2019). More than half of the species of this order are phytophagous feeding on only one or a few plant species although some are polyphagous. Approximately 6,300 species of Thysanoptera are known worldwide, of which about 130 are pests (Thrips Wiki, 2022; Mound et al., 2022). Some groups of thrips feed preferentially on flowers, while others prefer exclusively leaves, but pollen, fruits and young shoots can also be food sources for these insects (Mound et al., 2022). Thrips are important for the agriculture due to direct and indirect damage, including virus transmission (Monteiro et al., 1998). In addition, they feed on different species of cultivated plants and weeds, many of them found in the cotton production environment (Cook et al., 2011).

Thrips are commonly found at the early stages of cotton plants (*Gossypium hirsutum* L.) feeding on the epidermal cells of the leaf mesophyll (Kaur et al., 2018; Nadeem et al., 2022). Intensive feeding by thrips causes terminal malformation in cotton seedlings, abnormal growth and, in extreme cases, death of the growing bud, leading to loss of apical dominance (Kerns et al., 2019).

In Brazil, *Frankliniella schultzei* (Trybom) (Thysanoptera: Thripidae) is the main thrips species recorded and damaging cotton plants in the states of Goiás, Mato Grosso do Sul, Paraná, Pernambuco and São Paulo, although *Caliothrips phaseoli* (Hood) and other species of *Frankliniella* spp. are also found in lowers numbers on this plant (Monteiro et al., 1998).

In April 2022, a severe infestation by a thrips species was observed on cotton plants, BRS 368 RF, with 85 days old, grown in 30 pots with a capacity of 5 L each one in a screened greenhouse at the Embrapa Algodão, municipality de Campina Grande, Paraíba, Brazil (7° 13'35" S, 35° 54'21" W). The number of individuals and aggregations of this thrips per plant, individuals per aggregations and the proportion of adults and immature stages on ten cotton

plants were evaluated on all leaves of each plant. Adults of the thrips were collected from the leaves, transferred to glass vials containing 70% alcohol and identified (Mound and Marullo, 1996). The thrips was identified as *Retithrips syriacus* Mayet (Thysanoptera: Thripidae) based on specimens deposited in the reference collection of the Federal University of Rio Grande, Rio Grande do Sul, Brazil.

A mean total of 38 individuals of *R. syriacus* were obtained per cotton plant in eight aggregations with 4.7 individuals per aggregation. Adults of *R. syriacus* represented 54% of the population of individuals sampled, present on both leaf sides, but mainly on the apical region of the cotton plants. *Retithrips syriacus* adults was found mainly on the adaxial part of the cotton leaves without belonging to aggregations (Figure 1 A-1B) only on the abaxial part of the leaves (Figure 1C). These aggregations were composed of 50%, 24% and 26% of larvae, pupae and adults *R. syriacus*, respectively. The larvae, initially hyaline, turned yellow-orange and then red; the pupae's voluminous body was dark red and less shiny than the larvae, with long bristles and a small, round, flattened disc at the apex (Bragard et al., 2021). Newly emerged adults are black in color with both pairs of light wings with dark spots and light brown legs (Elimem et al., 2011; Bragard et al., 2021). Damage by *R. syriacus* usually resulted in small depressions on the leaf surface that turned gray as a result of cell death (Figure 1D) due to suction of cell contents (Elimem et al., 2011). The increase in the number of aggregations of *R. syriacus* completely covered the leaves of the cotton plants, changing the natural green of the leaf blade to a silver tone with numerous black spots (Figure 1C), due to the feces of this mite in the area infested (Kaur et al., 2018).

Retithrips syriacus is a polyphagous species native to Central Africa and found in several countries of the Americas, including Brazil (Moreira et al., 2012; Lima et al., 2019, 2020). The number of host plants of these thrips includes over 50 species belonging to more than 20 families (Bragard et al., 2021). Damage by this mite has

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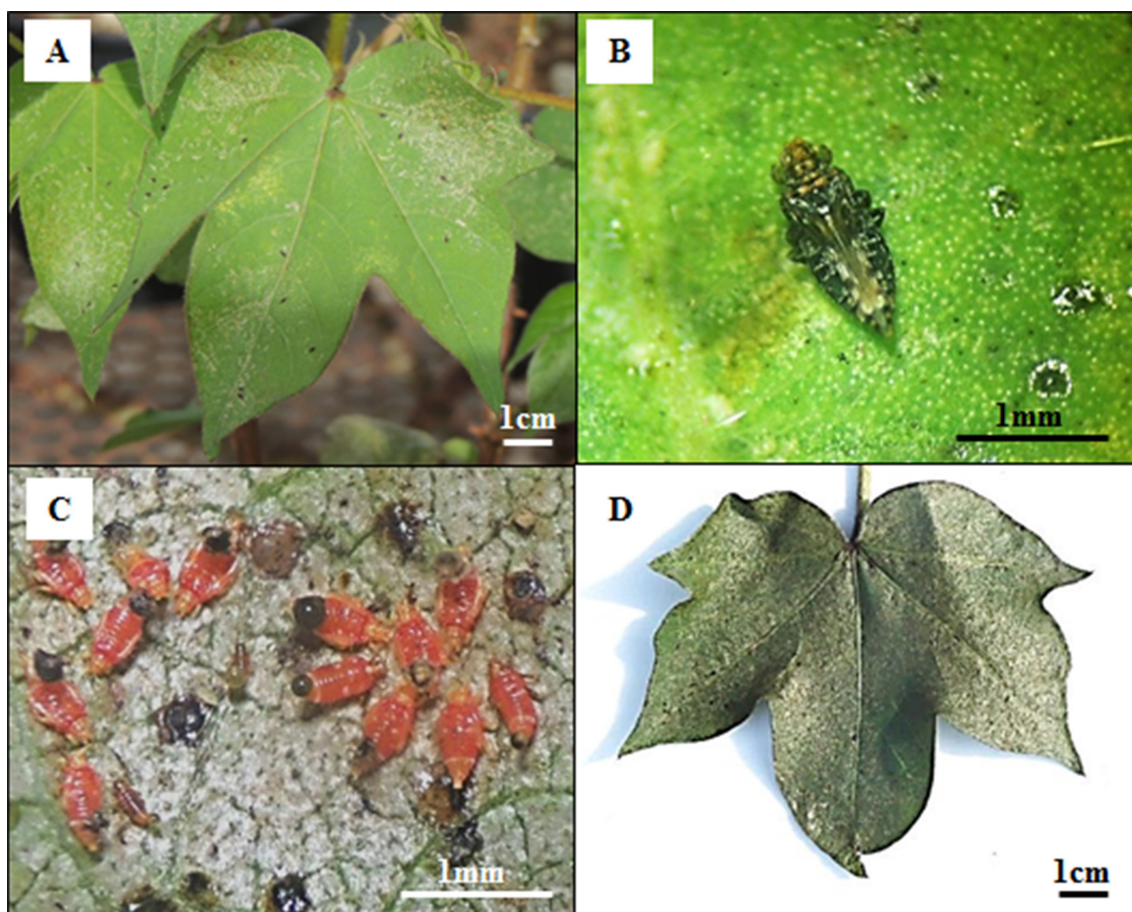


Figure 1. Adaxial part of the cotton leaf, partially damaged by *Retithrips syriacus* (Thysanoptera: Thripidae) with small chlorotic spots (A), adult insect (B), colony with red nymphs of *R. syriacus* (C) and silver leaf, severely attacked (D).

been reported on numerous cultivated plants around the world, especially *Gossypium hirsutum* (Malvaceae), *Persea americana* (Lauraceae) and *Vitis vinifera* (Vitaceae). In Brazil, *R. syriacus* has been reported feeding on leaves of *Carica papaya* (Caricaceae), *Eucalyptus* sp. (Myrtaceae), *Jatropha curcas* (Euphorbiaceae), *Manihot glaziovii* (Euphorbiaceae); *Rosa* sp. (Rosaceae), *Terminalia catappa* (Combretaceae) and *Vitis vinifera* (Moreira et al., 2012; Lima et al., 2020). This species is not a vector of phytoviruses and leaf tissue damage is produced by the mechanical action of its biting-sucking mouthparts (Mound et al., 2022).

Thrips generally cause greater damage in periods of limiting climatic conditions for seedling growth, particularly in dry and hot climates (Kaur et al., 2018; Nadeem et al., 2022). Water stress conditions favor infestation of *J. curcas* plants by this pest (Lima et al., 2020) and its location around the greenhouse may have stimulated the migration of *R. syriacus* thrips to cotton plants, resulting in high damage levels. Cotton plants was infested in periods with average temperature, relative humidity and precipitation of 25°C, 70% and 45 mm, respectively, in the region of Campina Grande, state of Paraíba, Brazil.

This is the first record of *R. syriacus* damaging cotton plants in Brazil.

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References

- BRAGARD, C., SERIO, F., GONTHIER, P., MIRET, J.A.J., JUSTESEN, A.F., MAGNUSSON, C.S., MILONAS, P., NAVAS-CORTES, J.A., PARNELL, S., POTTING, R., REIGNAULT, P.L., THULKE, H.-H., VAN DER WERF, W., CIVERA, A.V., YUEN, J., ZAPPALÀ, L., GREGOIRE, J.-C., MALUMPHY, C., CZWIENCZEK, E., KERTESZ, V., MAIORANO, A. and MACLEOD, A., 2021. Pest categorisation of *Retithrips syriacus*. *EFSA Journal*, vol. 19, no. 11, p.e06888. PMID:34765032.
- COOK, D., HERBERT, A., AKIN, D.S. and REED, J., 2011. Biology, crop injury, and management of thrips (Thysanoptera: Thripidae) infesting cotton seedlings in the United States. *Journal of*

- Integrated Pest Management*, vol. 2, no. 2, pp. 1-9. <http://dx.doi.org/10.1603/IPM10024>.
- ELIMEM, M., NAVARRO-CAMPOS, C. and CHERMITI, B., 2011. First record of black vine thrips, *Retithrips syriacus* Mayet, in Tunisia. *EPP0 Bulletin*, vol. 41, no. 2, pp. 174-177. <http://dx.doi.org/10.1111/j.1365-2338.2011.02461.x>.
- KAUR, B., KURAPARTHY, V., BACHELER, J., FANG, H. and BOWMAN, D.T., 2018. Screening germplasm and quantification of components contributing to thrips resistance in cotton. *Journal of Economic Entomology*, vol. 111, no. 5, pp. 2426-2434. <http://dx.doi.org/10.1093/jee/toy201>. PMID:29986081.
- KERNS, C.D., GREENE, J.K., REAY-JONES, F.P.F. and BRIDGES JUNIOR, W.C., 2019. Effects of planting date on thrips (Thysanoptera: Thripidae) in cotton. *Journal of Economic Entomology*, vol. 112, no. 2, pp. 699-707. <http://dx.doi.org/10.1093/jee/toy398>. PMID:30597059.
- LIMA, É.F.B., O'DONNELL, C.A. and MIYASATO, E.A., 2020. The Panchaetothripinae (Thysanoptera, Thripidae) of Brazil, with one new *Caliothrips* species. *Zootaxa*, vol. 4820, no. 2, pp. 201-230. <http://dx.doi.org/10.11646/zootaxa.4820.2.1>. PMID:33056065.
- LIMA, I.M.B., ALMEIDA-FILHO, M.A., LIMA, M.G.A., BONILLA, O.H. and LIMA, E.F.B., 2019. Thrips species (Insecta: Thysanoptera) associated with flowers in a restinga fragment in northeastern Brazil. *Brazilian Journal of Biology = Revista Brasileira de Biologia*, vol. 79, no. 1, pp. 6-14. <http://dx.doi.org/10.1590/1519-6984.169071>. PMID:29590250.
- MONTEIRO, R.C., ZUCCHI, R.A. and MOUND, L.A., 1998. Thrips tabaci Lind.: é realmente uma praga do algodoeiro no Brasil? *Anais da Sociedade Entomológica do Brasil*, vol. 27, no. 3, pp. 489-494. <http://dx.doi.org/10.1590/S0301-80591998000300021>.
- MOREIRA, A.N., OLIVEIRA, J.V.D., OLIVEIRA, J.E.D.M., OLIVEIRA, A.C. and SOUZA, I.D.D., 2012. Variação sazonal de espécies de trips em videira de acordo com sistemas de manejo e fases fenológicas. *Pesquisa Agropecuária Brasileira*, vol. 47, no. 3, pp. 328-335. <http://dx.doi.org/10.1590/S0100-204X2012000300003>.
- MOUND, L.A. and MARULLO, R., 1996. *The thrips of Central and South America: an introduction (Insecta: Thysanoptera)*. Gainesville: Associated Publishers. 488 p. *Memoirs on Entomology, international*, no. 6.
- MOUND, L.A., WANG, Z., LIMA, E.F.B. and MARULLO, R., 2022. Problems with the concept of "pest" among the diversity of pestiferous thrips. *Insects*, vol. 13, no. 1, p. 61. <http://dx.doi.org/10.3390/insects13010061>. PMID:35055903.
- NADEEM, A., TAHIR, H.M. and KHAN, A.A., 2022. Plant age, crop stage and surrounding habitats: their impact on sucking pests and predators complex in cotton (*Gossypium hirsutum* L.) field plots in arid climate at district Layyah, Punjab, Pakistan. *Brazilian Journal of Biology = Revista Brasileira de Biologia*, vol. 82, p. e236494. <http://dx.doi.org/10.1590/1519-6984.236494>. PMID:34133551.
- THRIPS WIKI, 2022 [viewed 15 January 2022]. *ThripsWiki-providing information on the world's thrips* [online]. Available from: https://thrips.info/wiki/Main_Page