

Scientific Note

First record of *Caliothrips phaseoli* Hood, 1912 (Thysanoptera: Thripidae) causing damage to forage grasses

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Abstract. This paper reports the first record of *Caliothrips phaseoli* Hood, 1912 (Thysanoptera: Thripidae) causing damage to forage grasses of the species *Panicum maximum* in the pasture formation phase. Due to the damage observed, it is assumed that the occurrence of these insects at the beginning of the grass implementation phase can, in large infestations, reduce the photosynthetic area of the plants, delaying their growth and consequently the formation of the pasture.

Keywords: Thrips, Pasture pests, Pasture formation.

Thrips are small insects that suck sap from the leaves, flowers and fruits of various plants. The damage can be direct, causing striations, deformations and silvering of the leaves, or indirect, influencing the transmission of viruses in different crops. Most species are either phytophagous or fungivorous (Mound 2005), but a few have predatory habits (Wang et al. 2022), and around 150 are important agricultural pests (Mound et al. 2022).

Many Thysanoptera groups are associated with forages. Most of them, such as *Bregmatothrips* Hood, 1912, *Chirothrips* Haliday, 1836 and *Plesiothrips* Hood, 1915, are associated with Poaceae species (Mound 2011; Nakahara & Footit 2012; Mound et al. 2016), and a few have been reported as occurring in or damaging legume pastures, such as *Enneothrips enigmaticus* Lima et al., 2022 (Thysanoptera: Thripidae) in *Arachis pintoi* Krapov & W.C. Gregory (Fazolin et al. 2015; Lima et al. 2022).

In a newly formed pasture area in Mato Grosso do Sul state in Brazil with the forage grass *Panicum maximum* cv. BRS Kenya (20°25'15.9" S, 54°41'19.7" W) in March 2022, leaf chlorosis was detected in most plants in the cultivated area (Fig. 1). Plants covering the entire area (15 ha) were randomly inspected seven days after emergence (Fig. 2). During the inspection, specimens of thrips were found (Fig. 4), and a single sample of 88 specimens was collected with an entomological aspirator and stored in a bottle containing 70% alcohol. A subsample containing 44 specimens was separated and sent for identification. The material was prepared on permanent microscopy slides and subsequently identified. Voucher specimens were deposited in the Natural History Collection of the Federal University of Piauí.

Fourteen days later, another inspection was carried out in the area, following heavy rain in the region. In this inspection, few specimens were observed, along with less damage to the grass leaves. Over the following months, with the development of the plants, no further damage was observed.

The specimens collected were identified as *Caliothrips phaseoli* Hood, 1912 (Thysanoptera: Thripidae) (Fig 4). This is the first record of this species in forage grasses.

Individuals of *C. phaseoli* are polyphagous and considered important pests of bean and soybean crops, having also been reported in cotton, peanut, mint, grapia and lettuce plants, among others (Monteiro et al. 1999; Beltrán et al. 2004; Boito et al. 2006; Boiça Junior et al. 2015;

Lima et al. 2016; Ferreira 2018; Boscardin et al. 2019; Lima et al. 2020; Neves et al. 2022; Warpechowsky et al. 2024).

The species was initially described in the United States, but is widely distributed in the Americas and is the most commonly found *Caliothrips* species in Brazil. Adults are dark brown bicolored legs and fore wings. Females being larger than males, measuring approximately 1.1 mm (Lima et al. 2020). The cycle from egg to adult lasts around 19 days in bean plants (Sosa et al. 2017), with direct damage resulting from sap sucking, which causes injury and, depending on the attack and the plant attacked, punctures and leaf falls (Boscardin et al. 2019).



Figure 1. *Caliothrips phaseoli* damage on *Panicum maximum* 7 days after seedling emergence (Photo: Fabricia Z. V. Torres).

The occurrence of thrips in pastures did not appear to be worrying at the time of the cited attack; however, as the damage occurred at the beginning of the grass implantation, it can, in large infestations, reduce the photosynthetic area, delaying plant growth and consequently the formation of the pasture. Damage to pastures in formation is equally observed and concerning with other pests such as the rice flea, *Chaetocnema* sp. (Coleoptera: Chrysomelidae); the striped grass

caterpillar, *Mocis latipes* (Guenée, 1852) (Lepidoptera: Erebididae); the military caterpillar, *Spodoptera frugiperda* (Smith, 1797) (Lepidoptera: Noctuidae); and the elasm caterpillar, *Elasmopalpus lignosellus* (Zeller, 1848) (Lepidoptera: Pyralidae) (Torres 2022).



Figure 2. *Panicum maximum* pasture area in the implementation phase (Photo: Fabricia Z. V. Torres).



Figure 3. *Caliothrips phaseoli* and its damage in *Panicum maximum*. (Photo: Fabricia Z. V. Torres).



Figure 4. Slide-mounted *Caliothrips phaseoli* female. (Photo: Éilson F. B. Lima).

Caliothrips phaseoli is mainly associated with leguminous plants, and this is the first record of the species in a Poaceae in Brazil (Lima et al. 2020). Thus, special attention is recommended in areas where forage grasses are planted next to crops such as peanuts, forage peanuts, beans and soybeans or in grass-legume consortiums. In these cases, the treatment of seeds with insecticides registered for pastures is recommended as a preventive measure.

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Authors' Contribution

FZVT: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Writing - original draft; LCT: Conceptualization, Investigation, Writing - review & editing; ÉFBL: Data curation, Formal analysis, Writing - review & editing.

Conflict of Interest Statement

We have no conflicts of interest to disclose.

References

- Beltrán, R.; Helman, S.; Peterlin, O. (2004) Control de *Caliothrips phaseoli* Hood y *Frankliniella schultzei* Trybon y *Aphis gossypii* Glover con insecticidas sistémicos aplicados a las semillas de algodón. *Revista de Investigaciones Agropecuarias*, 33(1): 39-48.
- Boiça Júnior, A. L.; Costa, E. N.; Souza, B. H. S.; Silva, A. G.; Chiorato, A. F. (2015) Infestation of *Caliothrips phaseoli* (Thysanoptera: Thripidae) on bean cultivars grown in the winter, rainy, and dry seasons in Brazil. *Environmental Entomology*, 44(4): 1139-1148. doi: [10.1093/ee/nvv100](https://doi.org/10.1093/ee/nvv100)
- Boito, G.; Ornaghi, J. A.; Giuggia, J. A.; Giovanini, D. (2006) Primera cita de dos especies de insectos sobre el cultivo de maní (*Arachis hypogaea* L.) en Córdoba, Argentina. *Agriscientia*, 23(2): 99-103.
- Boscardin, J.; Oliveira, G. G. O.; Costa, E. C.; Aimi, S. C.; Fleck, M. D.; Araujo, M. M. (2019) First record of *Caliothrips phaseoli* (Hood, 1912) (Thysanoptera: Thripidae) in *Apuleia leiocarpa* (Fabaceae) seedlings in Rio Grande do Sul, Brazil. *Pesquisa Florestal Brasileira*, 39: e201801636. doi: [10.4336/2019.pfb.39e201801636](https://doi.org/10.4336/2019.pfb.39e201801636)
- Fazolin, M.; Vasconcelos, G. J. N.; Lima, E. F. B.; Santos, R. S.; Azevedo, H. N. (2015) *Reconhecimento de artrópodes de importância econômica para o amendoim forrageiro*. Rio Branco: Embrapa Acre. (Documentos, 137).
- Ferreira, V. A. (2018) *Caliothrips phaseoli* em alface em Ivoti, RS. *Agriporticus*. <http://www.agronomicabr.com.br/agriporticus/detalhe.aspx?id=733>. Access on: 21.i.2023
- Lima, É. F. B.; Alencar, A. R. S.; Nanini, F.; Michelotto, M. D.; Correa, A. S. (2022) "Unmasking the villain": integrative taxonomy reveals the real identity of the key pest (Thysanoptera: Thripidae) of peanuts (*Arachis hypogaea*) in South America. *Insects*, 13(2): 120. doi: [10.3390/insects13020120](https://doi.org/10.3390/insects13020120)
- Lima, É. F. B.; Thomazini, M. Santos, R. S.; Lopes, E. N.; Saito, L.; Zucchi, R. A. (2016) New findings of thrips (Thysanoptera: Thripidae) on plants in Brazil. *Florida Entomologist*, 99(1): 146-149. doi: [10.1653/024.099.0133](https://doi.org/10.1653/024.099.0133)
- Lima, É. F. B.; O'Donnell, C. A.; Miyasato, E. A. (2020) The Panchaetothripinae (Thysanoptera, Thripidae) of Brazil, with one new *Caliothrips* species. *Zootaxa*, 4820(2): 201-230. doi: [10.11646/zootaxa.4820.2.1](https://doi.org/10.11646/zootaxa.4820.2.1)
- Monteiro, R. C., Mound, L. A., Zucchi, R. A. (1999) Thrips (Thysanoptera) as pests of plant production in Brazil. *Revista Brasileira de Entomologia*, 43(3-4): 163-171.
- Mound, L. A. (2005) Thysanoptera: diversity and interactions. *Annual Review of Entomology*, 50: 247-269. doi: [10.1146/annurev.ento.49.061802.123318](https://doi.org/10.1146/annurev.ento.49.061802.123318)

- Mound, L. A. (2011) Grass-dependent Thysanoptera of the family Thripidae from Australia. *Zootaxa*, 3064(1): 1-40. doi: [10.11646/zootaxa.3064.1.1](https://doi.org/10.11646/zootaxa.3064.1.1)
- Mound, L., Lima, E., O'Donnell, C., Cavalleri, A. (2016) The New World grass-thrips genus *Plesiothrips* (Thysanoptera: Thripidae) and its palaeotropical relationships. *Austral Entomology*, 55(3): 340-346. doi: [10.1111/aen.12198](https://doi.org/10.1111/aen.12198)
- Mound, L. A.; Wang, Z.; Lima, É. F. B.; Marullo, R. (2022) Problems with the Concept of "Pest" among the Diversity of Pestiferous Thrips. *Insects*, 13: 61. doi: [10.3390/insects13010061](https://doi.org/10.3390/insects13010061)
- Nakahara, S.; Foottit, R. G. (2012) Review of *Chirothrips* and related genera (Thysanoptera: Thripidae) of the Americas, with descriptions of one new genus and four new species. *Zootaxa*, 3251(1): 1-29. doi: [10.11646/zootaxa.3251.1.1](https://doi.org/10.11646/zootaxa.3251.1.1)
- Neves, D. V. C.; Lopes, M. C.; Sarmiento, R. A.; Pereira, P. S.; Pires, W. S.; Peluzio, J. M.; Picanço, M. C. (2022) Economic injury levels for control decision-making of thrips in soybean crops (*Glycine max* (L.) Merrill). *Research, Society and Development*, 11(9): e52411932114. doi: <https://doi.org/10.33448/rsd-v11i9.32114>
- Sosa, M. R.; Zamar, M. I.; Torrejon, S. E. (2017) Ciclo de vida y reproducción de *Caliothrips phaseoli* (Thysanoptera: Thripidae) sobre Fabaceae y Solanaceae (Plantae) en condiciones de laboratorio. *Revista de La Sociedad Entomológica Argentina*, 76(3-4): 1-6 doi: [10.25085/rsea.763401](https://doi.org/10.25085/rsea.763401)
- Torres, F. Z. V. (2022) *Pragas das pastagens: características, danos e manejo*. Campo Grande: Embrapa Gado de Corte. (Documentos, 300).
- Wang, Z.; Mound, L. A.; Hussain, M. Arthurs, S. P.; Mao, R. (2022) Thysanoptera as predators: their diversity and significance as biological control agents. *Pest Management Science*, 78 (12): 5057-5070. doi: [10.1002/ps.7176](https://doi.org/10.1002/ps.7176)
- Warpechowski, L. F.; Steinhaus, E. A.; Moreira, R. P.; Godoy, D. N.; Preto, V. E.; Braga, L. E.; Wendt, A. F.; Reis, A. C.; Lima, E. F. B.; Farias, J. R., et al. (2024) Why does identification matter? Thrips species (Thysanoptera: Thripidae) found in soybean in southern Brazil show great geographical and interspecific variation in susceptibility to insecticides. *Crop Protection*, 178: 106592. doi: [10.1016/j.cropro.2024.106592](https://doi.org/10.1016/j.cropro.2024.106592)