


Scientific Note

First report of *Anastrepha obliqua* (Macquart, 1835) (Diptera: Tephritidae) infesting pitaya (*Selenicereus undatus* (Haw.) D.R. Hunt) in Brazil

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Abstract. Fruit flies are insects with a high destructive potential and require a management and control plan in various fruit crops. Among them, pitaya cultivation (*Selenicereus undatus* (Haw.) D.R. Hunt – Cactaceae), which has been increasing in the state of Mato Grosso do Sul and in the all Brazil. Pitaya containing Diptera larvae were collected in the municipality of Costa Rica, state of Mato Grosso do Sul, Brazil and taken to the laboratory to adult insect obtention. The adults emerged was identified as *Anastrepha obliqua* (Macquart, 1835) (Diptera: Tephritidae). This work is the first report of *A. obliqua* associated with pitaya fruits in Brazil.

Keywords: dragon fruit, host plant, fruit fly, new records.

The pitaya is a fruit crop belonging to the genus *Selenicereus* Britton & Rose under Cactaceae family. It is a native cactus to the Americas; it stands out for its unique beauty and attractive colors. The pulp represents about 70% of the fruit, offering potential for both fresh and industrial consumption due to its organoleptic characteristics and use as a natural colorant (Cruz & Martins 2022; Lim et al. 2025)

Brazil, one of the world's leading fruit producers, achieved revenues of US\$ 1.77 million in 2022 from dragon fruit exports, representing an 80% increase compared to the previous year, reaching important markets such as the European Union, Canada, and the United Kingdom (ABRAFRUTAS 2023). This increase reflects the expansion of the crop in the country, especially among small producers, who seek the high added value of the fruits.

Because this is a growing crop, it's essential to understand all aspects of cultivation, considering the development of technologies and orchard management practices in light of the challenges this expansion brings. Considering its territorial expansion in the state of Mato Grosso do Sul, attention must be paid to the occurrence of diseases and pests that can become serious phytosanitary problems, compromising production (Araújo et al. 2024; Silveira et al. 2024).

The genus *Anastrepha* Schiner, 1868 (Diptera: Tephritidae) comprises species that are widely distributed in Neotropical region and is recognized as one of the main pests of world fruit production, especially because some species are quarantine pests that impose significant trade restrictions, limiting marketing due to restrictive measures in importing countries (Mello Garcia 2024). For effective management of this pest, it is important to record its distribution and host population. To date, there are no records of fruit flies in dragon fruit in Brazil.

Nine pitaya fruits of *Selenicereus undatus* (Haw.) D.R. Hunt exhibiting external signs of insect infestation were collected in April 2021, in a commercial orchard located in the municipality of Costa Rica, Mato Grosso do Sul state, Brazil (18°32'13.582" S and 53°8'9.024" W), and forwarded to the State University of Mato Grosso do Sul to the

Agricultural Entomology Laboratory (LEA) of the Aquidauana University Unit.

The fruit samples were placed in plastic trays containing fine-textured vermiculite (Fig. 1), sterilized, and completely covered with voile fabric. A large number of larvae were observed, including on the external surface of the fruits.

The fruits containing the larvae were then kept at room temperature until the adults emerged. After emergence, the insects were isolated and preserved in 70% alcohol. Shortly after this period, they were sorted and sent for species identification. The species identification was performed by Dr. Flávio Roberto Mello Garcia at the Universidade Federal de Pelotas.

The insects were identified as *Anastrepha obliqua* (Macquart, 1835) (Diptera: Tephritidae), a specie widely distributed in several Latin American countries and is considered a quarantine pest in several countries around the world (EPPO 2024). In Brazil, *A. obliqua* the most suitable areas were observed mainly near the coast and in the central region (states of Mato Grosso do Sul, São Paulo, and Goiás), which are currently occupied by the Atlantic Forest and Cerrado biomes (Santos et al. 2019). Is a specie with great distribution potential in the current climatic conditions in South America, polyphagous, infesting 73 plant species in different botanical families and is present in all twenty-six states (Zucchi & Moraes 2025).

In the Chaco Biomes, Pantanal of Mato Grosso do Sul, other species of the genus were reported by Lima et al. (2024), however, none associated with cacti. Still, exploring the Pantanal region, Nicácio & Uchôa (2011) analyzed several plant species and collected several species of *Anastrepha*, including *A. obliqua*, on seven different host plants, however, without any association with plants of the Cactaceae family.

In the Cerrado of Mato Grosso do Sul, in the region of the Serra da Bodoquena National Park, Almeida et al. (2019) reported the association of *A. obliqua* with cajá fruits (*Spondias mombim* L.), seven coats [*Campomanesia guazumifolia* (Cambess) O. Berg.] and



Figure 1. Fruits infested by fruit fly larvae: A) Fruits in vermiculite B) Larvae on the fruits, C) Fruits during the adult emergence period.

wild peach (*Eugenia myrcianthes* Nied). In municipalities such as Aquidauana and Corumbá, the specie was collected in seriguela fruits (*Spondias purpurea* L.), associated with fruits of the Anacardiaceae family (Rodrigues et al. 2006; Minzão & Uchôa-Fernandes 2008).

Reports of new species that may serve as hosts or even targets of fruit fly attacks contribute to establishing management practices and provide important information on population dynamics and sources of infesting populations. This is the case with fruit fly species that have already been observed infesting other cacti, such as *Anastrepha bahiensis* Lima, 1937, *Anastrepha barbiellini* Lima, 1938 (Almeida et al. 2019; Garcia & Norrbom 2011; Garcia et al. 2021) in *Pereskia* sp. and *A. obliqua* in *Opuntia ficus indica* (Sá et al. 2012; Leite et al. 2017).

For pitaya, there are no reports in the country of fruit flies associated with the crop, however, the occurrence of the oriental fruit fly, *Bactrocera dorsalis* (Handel, 1912) and *Bactrocera cucurbitae* (Coquillett, 1899) in pitaya fruits in plantations in Vietnam and Hawaii is known (McQuate 2010), and of the *B. dorsalis* in India (Akheela et al. 2024).

This is the first report of the specie *A. obliqua* infesting pitaya (*Selenicereus undatus* (Haw.) D.R. Hunt) in Brazil. Furthermore, this report opens the way for new work to help understand the interaction between fruit flies and pitaya.

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Authors' Contributions

LCFZ: Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing; DLS: Conceptualization, Writing – review & editing; JVS: Investigation, Writing – original draft, Visualization; FRMG: Methodology, Investigation, Writing – original draft; ACCS: Investigation, Writing – original draft.

Conflict of Interest Statement

The authors declare no competing interests.

Data Availability

The data that support this study are available on request from the corresponding author.

Generative IA Statement

The authors declare that ChatGPT was used only for minor language editing. All scientific content, data analysis, interpretation of results, and conclusions were produced exclusively by the authors.

References

- ABRAFRUTAS (2023) Exportação e promoção da pitaya no 2º Simpósio Brasileiro das Pitayas. <https://abrafrutas.org/2023/03/abrafrutas-discute-processo-de-exportacao-e-promocao-da-pitaya-no-2o-simposio-brasileiro-das-pitayas>. Access on: 15.iii.2025.
- Akheela, P.; Santhoshkumar, T.; Varghese, T. S. (2024) First report of *Bactrocera dorsalis* (Hendel) (Diptera, Tephritidae) on the white-fleshed dragon fruit *Selenicereus undatus* (Haworth) D.R. Hunt (Cactaceae). *Entomon*, 49(2): 283–286. doi: 10.33307/entomon.v49i2.1190
- Almeida, L. B. M.; Coelho, J. B.; Uchoa, M. A.; Gisloti, L. J. (2019) Diversity of fruit flies (Diptera: Tephritoidea) and their host plants in a conservation unit from Midwestern Brazil. *Florida Entomologist*, 102(3): 562–571. doi: 10.1653/024.102.0333
- Araújo, H. F. P.; Brito, C. H.; Kerpel, S. M.; Oliveira Filho, M. C. (2024) First record of *Aricoris campestris* (Bates, 1868) (Lepidoptera: Riodinidae) in pitaya in northeastern Brazil. *Revista Caatinga*, 37: e12190. doi: 10.1590/1983-21252024v3712190rc
- Cruz, M. C. M.; Martins, R. S. (2022) *Pitaya no Brasil, nova opção de cultivo*. Florianópolis: EPAGRI.
- EPP0 (2024) *Anastrepha obliqua* (ANSTOB). European and Mediterranean Plant Protection Organization – EPP0 Global Database. <https://gd.eppo.int/taxon/ANSTOB>. Access on: 17.iv.2025.
- Garcia, F. R. M.; Norrbom, A. L. (2011) Tephritoid flies (Diptera, Tephritoidea) and their plant hosts from the State of Santa Catarina

- in Southern Brazil. *Florida Entomologist*, 94(2): 151-157. doi: [10.1653/024.094.0205](https://doi.org/10.1653/024.094.0205)
- Garcia, F. R. M., Araujo, E. S., Krüger, A. P., Telles, M. H. F., & Costa, V. A. (2021) First record of parasitoids (Hymenoptera: Braconidae) associated with *Anastrepha barbiellinii* Lima, 1938 (Diptera: Tephritidae). *Brazilian Journal of Biology*, 81(4): 1125–1126. doi: [10.1590/1519-6984.234183](https://doi.org/10.1590/1519-6984.234183)
- Lim, T. W.; Lim, R. L. H.; Pui, L. P.; Tan, C. P.; Ho, C. W. (2025) Red dragon fruit (*Hylocereus polyrhizus*), a superfruit rich in betacyanins pigments with antioxidative potential for hepatoprotection: A review. *Future Foods*, (11): e100562. doi: [10.1016/j.fufo.2025.100562](https://doi.org/10.1016/j.fufo.2025.100562)
- Lima, J. Q. A.; Uchoa, M. A.; Nicácio, J.; Garcia, F. R. M. (2024) Diversity of *Anastrepha* spp. (Diptera: Tephritidae) in the Chaco Biome. *Brazilian Journal of Biology*, 84: e279258. doi: [10.1590/1519-6984.279258](https://doi.org/10.1590/1519-6984.279258)
- Leite, S. A.; Castellani M. A.; Ribeiro A. E. L.; Costa D. R. D.; Bittencourt M. A. L.; Moreira A. A. (2017) Fruit flies and their parasitoids in the fruit growing region of Livramento de Nossa Senhora, Bahia, with records of unprecedented interactions. *Revista Brasileira de Fruticultura*, 39(4): e-592. doi: [10.1590/0100-29452017592](https://doi.org/10.1590/0100-29452017592).
- McQuate, G. T. (2010) Tephritid fruit fly populations in a dragonfruit orchard in Hawaii: Border plant use and infestation rate. *Proceedings of the Hawaiian Entomological Society*, 42: 41–48.
- Minzão, E. R.; Uchôa-Fernandes, M. A. (2008) Diversidade de moscas frugívoras (Diptera, Tephritoidea) em áreas de matas decídua e ciliar no Pantanal Sul-mato-grossense, Brasil. *Revista Brasileira de Entomologia*, 52 (3): 441–445. doi: [10.1590/S0085-56262008000300018](https://doi.org/10.1590/S0085-56262008000300018)
- Mello Garcia, F. R. (2024) Fruit Flies: A Threat to Fruit Production in the Americas. In: Mello Garcia, F. R. (Eds.), *Management of Fruit Flies in the Americas*. Springer, Cham. doi: [10.1007/978-3-031-48608-1_1](https://doi.org/10.1007/978-3-031-48608-1_1)
- Nicácio, J.; Uchôa, M. A. (2011) Diversity of frugivorous flies (Diptera: Tephritidae and Lonchaeidae) and their relationship with host plants (Angiospermae) in environments of South Pantanal region, Brazil. *Florida Entomologist*, 94(3): 443–466. doi: [10.1653/024.094.0309](https://doi.org/10.1653/024.094.0309)
- Rodrigues, S. R.; Nantes, L. R.; Souza, S. R.; Abot, A. R.; Uchoa-Fernandes, M. A. (2006) Frugivorous flies (Diptera: Tephritidae) collected in Aquidauana, MS. *Revista Brasileira de Entomologia*, 50(1): 131–134. doi: [10.1590/S0085-56262006000100021](https://doi.org/10.1590/S0085-56262006000100021)
- Sá, R. F. de; Castellani, M. A.; Nascimento, A. S. do; Ribeiro, A. E. L.; Moreira, A. A. (2012) Parasitismo natural em moscas-das-frutas (Diptera: Tephritidae) no semiárido do sudoeste da Bahia, Brasil. *Revista Brasileira de Fruticultura*, 34(4): 1266-1269. doi: [10.1590/0100-29452017592](https://doi.org/10.1590/0100-29452017592)
- Santos, R. P.; Silva, J. G. da; Miranda, E. A. (2019) The Past and Current Potential Distribution of the Fruit Fly *Anastrepha obliqua* Macquart (Diptera: Tephritidae) in South America. *Neotropical Entomology*, 48(2): 1678-8052. doi: [10.1007/s13744-019-00741-1](https://doi.org/10.1007/s13744-019-00741-1)
- Silveira, A. T. L.; Figueira, A. R.; Gontijo, G. R.; Pessoa, V. F. S.; Pio, L. A. S.; Pozza, E. A. (2024) Incidence and spatial pattern of viruses in commercial dragon fruit orchards in southern Minas Gerais, Brazil. *European Journal of Plant Pathology*, 170(1): 15–24. doi: [10.1007/s10658-024-02877-2](https://doi.org/10.1007/s10658-024-02877-2)
- Zucchi, R. A.; Moraes, R. C. B. (2025) Fruit flies in Brazil - *Anastrepha* species their host plants and parasitoids. <http://www.lea.esalq.usp.br/anastrepha>. Access on: 15.x.2025.