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Scientific Note

Record of *Trichogramma marandobai* Brun, Moraes & Soares, 1986 (Hymenoptera: Trichogrammatidae) in cassava crops in the Federal District, Brazil

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Abstract. This note reports the first record of the egg parasitoids *Trichogramma marandobai* Brun, Moraes & Soares, 1986 and *Trichogramma pretiosum* Riley, 1879 (Hymenoptera: Trichogrammatidae) in cassava (*Manihot esculenta* Crantz) crops in the Federal District, Brazil. Sampling was conducted in an experimental field at Embrapa Cerrados from August 2023 to June 2024, and male specimens were identified based on genital morphology. *Trichogramma marandobai* was recorded between March and April 2024, extending its known geographic distribution in Central-West Brazil. *Trichogramma pretiosum* is also reported for the first time in cassava crops in this region. These records expand current knowledge of egg parasitoid diversity associated with *Erinnyis ello* (L., 1758) (Lepidoptera: Sphingidae), support updates to the Taxonomic Catalog of the Brazilian Fauna (TCBF), and provide baseline information for the development of biological control strategies in cassava agroecosystems.

Keywords: egg parasitoids, Trichogrammatidae, cassava pest, biological control, geographic record.

Cassava (*Manihot esculenta* Crantz) is one of the main food crops cultivated in tropical regions and, in Brazil, is predominantly produced by smallholder farmers (Filgueiras & Homma 2016). Among the major phytosanitary constraints affecting this crop is the cassava hornworm, *Erinnyis ello* (L., 1758) (Lepidoptera: Sphingidae), whose high foliar consumption capacity can cause severe defoliation and significant yield losses (Bellotti et al. 1999; Carvalho et al. 2015; Pietrowski et al. 2024). This species exhibits high flight capacity and migratory behavior, combined with broad climatic adaptability, which contributes to its wide geographic distribution throughout the American continent, ranging from southern South America to regions near the Canadian border (Maia & Bahia 2010; Pietrowski et al. 2024). Consequently, infestations may occur suddenly as a result of migratory events from neighboring areas.

Several natural enemies contribute to the regulation of *E. ello* populations, particularly egg parasitoids of the family Trichogrammatidae, with emphasis on species of the genus *Trichogramma* Westwood, 1833 (Bellotti et al. 1992; 1999). Species of this genus are widely used worldwide in the biological control programs targeting lepidopteran pests (Zucchi et al. 2009; Querino & Zucchi 2019; Zucchi & Querino 2024). Approximately 240 species of *Trichogramma* have been described globally, of which 30 occur in Brazil and are distributed across all regions of the country (Zucchi & Querino 2024; Querino 2025). Most studies involving *Trichogramma* have focused on agricultural systems because of their importance for pest management (Querino & Zucchi 2019; Zucchi & Querino 2024).

In cassava agroecosystems, *Trichogramma* species have been reported as egg parasitoids of *E. ello*. Host specificity has been documented for some species, such as *T. manicobai*, recorded in Mato Grosso do Sul, Minas Gerais, Piauí, São Paulo and Paraná, and *T. marandobai*, previously reported in Alagoas, Amazonas, Espírito Santo, Mato Grosso do Sul, Minas Gerais, São Paulo, Paraná and Pará (Oliveira et al. 2010; Vieira et al. 2014; Querino et al. 2016; Querino et al. 2017; Querino & Zucchi 2019; Noronha et al. 2020; Querino 2025). Other generalist species, including *Trichogramma atopovirilia* Oatman & Platner, 1983 and *Trichogramma pretiosum* Riley, 1879 have also been recorded parasitizing *E. ello* eggs (Oliveira et al. 2010; Vieira et al. 2014; Souza et al. 2016). However, until now, no records of *Trichogramma* species associated with *E. ello* in cassava crops were available for the Federal District, Brazil. Therefore, this study aimed to record the occurrence of *Trichogramma* species in cassava crops in this region.

Surveys were conducted in an experimental cassava field at Embrapa Cerrados, Planaltina, DF (15°36' S and 47°43' W) from August 2023 to July 2024. Sampling was performed biweekly using sweep nets over the aerial parts of cassava plants. Each sampling event consisted of four replicates, with 60 sweep movements per replicate. Collected insects were preserved in 70% ethanol and transported to the Entomology Laboratory of Embrapa Cerrados.

Under a stereomicroscope, trichogrammatid parasitoids were separated by morphotype, counted and sexed based on morphology. Only males were slide-mounted using Hoyer's medium (Querino & Zucchi 2012), due to the presence of diagnostic taxonomic structures, including genital capsule, wings and antennae. Specimens were examined under a compound microscope at 4–100× magnification and identified following Querino & Zucchi (2012).

A total of 105 specimens were collected, comprising 97 females and eight males. Among the males, seven were identified as *T. marandobai* and one as *T. pretiosum*. *Trichogramma marandobai* was identified based on diagnostic characters, including a long and distinct intervolsellar process, a ventral carina not extending beyond half of the genital capsule, and a dorsal lamina with a narrow, rounded posterior extension at the same level as the intervolsellar process (Querino & Zucchi 2012; Vieira et al. 2015). This species was recorded between March and April 2024 (Fig. 1), coinciding with the occurrence period of *E. ello* in the field (Aguiar et al. 2010). *Trichogramma pretiosum* was identified by a long, pointed intervolsellar process not reaching the apex of the volsellae, a short ventral carina, an elongated dorsal lamina reaching the apex of the volsellae, ventral processes near the base of the intervolsellar process, and long flagelliform setae (Querino & Zucchi 2012).

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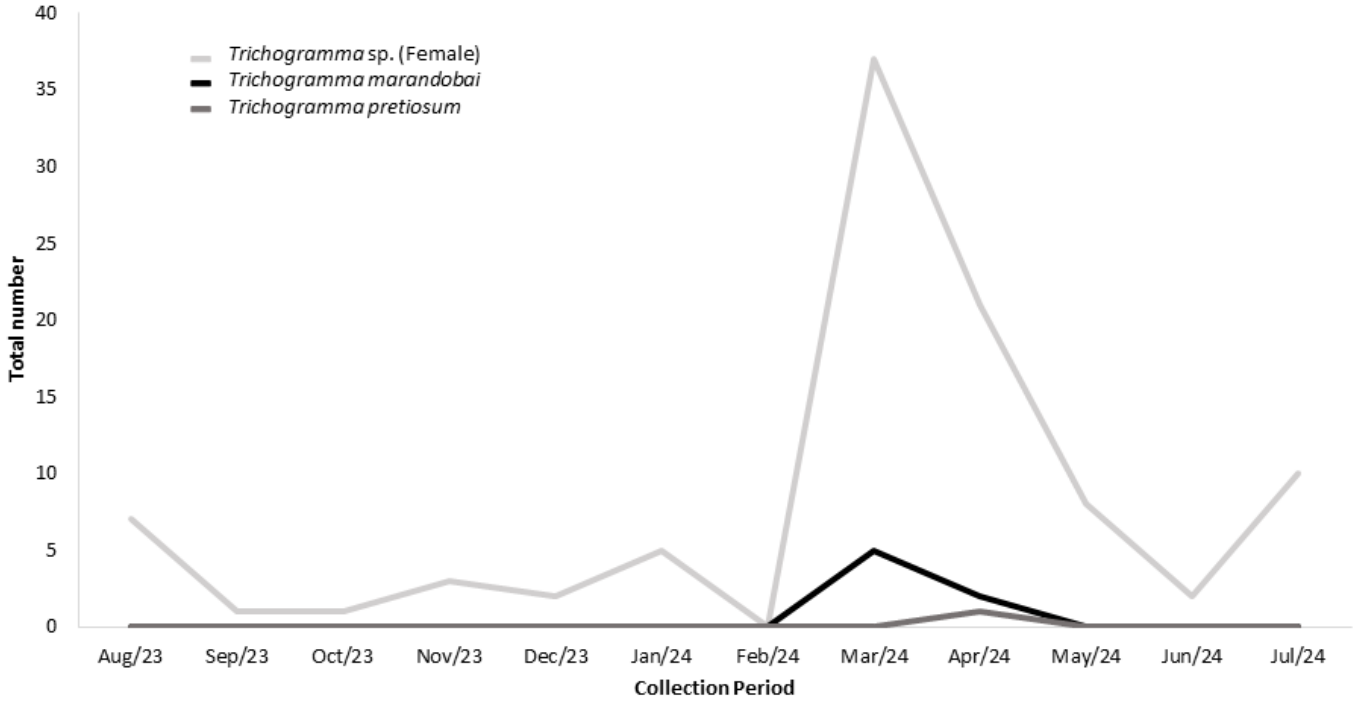

Figure 1. Population fluctuation of *Trichogramma* Westwood, 1833 (Hymenoptera: Trichogrammatidae) species collected in an experimental cassava (*Manihot esculenta* Crantz) field at Embrapa Cerrados, Planaltina, Federal District, Brazil, from August 2023 to July 2024.

This study represents the first record of *T. marandobai* in cassava crops in the Federal District and the first association of *T. pretiosum* with cassava crops in this region. In addition, the geographic distribution of *T. marandobai* is expanded, adding a new locality in the Central-West region of Brazil and supporting updates to the Taxonomic Catalog of the Brazilian Fauna (TCBF). These findings provide relevant baseline information for future biological control programs targeting *E. ello* in cassava agroecosystems.

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Authors' Contributions

SAO: Investigation; methodology; Writing – review and editing. MFSA**:** Investigation; methodology; Writing – review and editing. MLB**:** Investigation; methodology; Writing – review and editing. CMO: Investigation; methodology; Writing – review and editing. RBQ: Conceptualization; data curation; funding acquisition; investigation; methodology; visualization; writing – original draft; writing – review and editing.

Conflict of Interest Statement

The authors declare no conflicts of interest.

Ethical Approval

Not applicable.

Data Availability

Not applicable, all data used is disponible on manuscript.

Generative AI Statement

The authors declare that generative artificial intelligence tools were used only to assist with English language editing and grammar improvement and did not contribute to the study design, data analysis, interpretation of results, or scientific conclusions.

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