

Scientific Note

First report of *Andrallus spinidens* (Fabricius, 1787) (Hemiptera: Asopinae) in rice crops in Brazil

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Abstract. This study reports for the first time the occurrence of *Andrallus spinidens* (Fabricius, 1787) (Hemiptera: Asopinae) in Brazil (Itapecuru-Mirim, Maranhão). The stink bug was found preying on larvae of *Mocis latipes* (Guenée, 1852) (Lepidoptera: Noctuidae) in rice fields. This species is polyphagous and commonly found on various grass species. *Mocis latipes* has a wide distribution across the American continent and, in recent harvests, has shown the potential to cause significant damage to rice production in the state of Maranhão. Adults of *A. spinidens* were recorded during the 2021-2022 crop year, representing the first recent record of this species in Brazil. Additionally, we highlight a specimen of the species collected in 1981 in Roraima, also found in rice fields. This record contributes to enriching the information on the distribution of this asopine worldwide and its relevance as a biological control agent for rice pests in Brazil.

Keywords: *Oryza sativa*, predatory stink bug, biological control, Pentatomidae, *Mocis latipes*.

The stink bugs of the suborder Heteroptera are taxonomically organized into 61 families (Schuh & Weirauch 2020), with Pentatomidae being the fourth most diverse, comprising 940 genera and 4,949 species with a wide global distribution (Rider et al. 2018). Of the 10 subfamilies currently classified within Pentatomidae, six are present in the Neotropical region (Asopinae, Cyrtocorinae, Discocephalinae, Edessinae, Pentatominae and Strotomatinae) (Garbelotto & Campos 2014; Weiler et al. 2016).

The vast majority of pentatomids are phytophagous, feeding on various parts of plants, while others are predators, such as those belonging to the subfamily Asopinae (Chellappan & Ranjith 2023; Pal et al. 2023). Several species from this group have been used as biological control agents against insects that attack various agricultural crops (Roca-Cusachs et al. 2020; Grazia et al. 2024).

The predatory stink bug, *Andrallus spinidens* (Fabricius, 1787) (Hemiptera: Asopinae), is widely distributed in tropical and warm temperate zones worldwide (Shintani et al. 2010; Hyodo et al. 2014). It has been reported in Australia, Azerbaijan, Bangladesh, China, Congo, Cyprus, Equatorial Guinea, Ethiopia, Fiji, India, Indonesia, Iran, Japan, Madagascar, Malawi, Malaysia, Mozambique, Nepal, Pakistan, Russia, Singapore, South Africa, South Korea, Sudan, Syria, Taiwan, Tahiti, Thailand, Turkey, United Arab Emirates and Vietnam (Thomas 1994; Maheshwari et al. 2023; Pal et al. 2023; iNaturalist 2025). In the Americas, it is distributed in the United States, Mexico, Nicaragua, Costa Rica, Cuba, and Colombia (Thomas 1992; Castro-Huerta et al. 2022).

Andrallus spinidens is a polyphagous predator, commonly observed feeding on lepidopteran larvae (Sorkhabi-Abdolmaleki et al. 2013; Shylesha & Sravika 2018; Bhojendra et al. 2020; Grazia & Fernandes 2021), coleopterans (Shylesha & Sravika 2018; Grazia et al. 2024), and hymenopterans (Shintani et al. 2010), contributing to the natural reduction of pest insect populations and providing sustainable balance in agricultural crops (Zibae et al. 2012; Maheshwari et al. 2023).

According to Roca-Cusachs et al. (2020), *A. spinidens* is efficient in controlling pest insects in field crops, protected environments, and forests. Zibae et al. (2020) indicated that the stink bug controls larvae in sugarcane (*Saccharum officinarum* L.), pea (*Pisum sativum* L.), cowpea [*Vigna unguiculata* (L.) Walp.], wheat (*Triticum aestivum* L.), corn (*Zea mays* L. *Saccharata* Stur), soybean [*Glycine max* (L.) Merrill], and rice (*Oryza sativa* L.). The occurrence in rice crops was also mentioned by Shintani et al. (2010), Zibae et al. (2012), Shanker et al. (2017), Maheshwari et al. (2023) and Pal et al. (2023). Before this work, in Brazil, only the occurrence of the genus *Andrallus* Bergroth, 1905 has been reported, without specifying location or crop environment (Grazia et al. 2024).

In this context, the objective of this study is to report the occurrence of the species in Brazil based on specimens collected in Maranhão and Roraima, both found in rice crops. Specimens collected in the state of Maranhão, Brazil, were found during the 2021/2022 crop year (December to April) in a 1-hectare rice field located in the settlement unit Cristina Alves, village 17 de Abril, municipality of Itapecuru-Mirim, MA (03°31'09.5"S; 044°20'21.7"W). In this area, corn and beans are also frequently planted around the pasture.

Rice planting took place in December 2021, and from 25 days after the rice plants emerged, weekly zigzag sampling was conducted until the end of the crop's reproductive cycle. To collect the stink bugs, an entomological net was used (Pal et al. 2023), and the rice plants were also visually inspected (by examining the lower canopy and the entire plant).

After collection, the specimens were euthanized and preserved in 70% alcohol, then transported to the Entomology and Acarology Laboratory (LABENTO), at the Universidade Estadual do Maranhão (UEMA), São Luís Campus, MA. Subsequently, the samples were sorted, and the Pentatomidae species were separated and sent for identification to the Systematic Entomology Laboratory at the Universidade Federal do Rio Grande do Sul (UFRGS).

The specimens were identified based on the dichotomous key available in [Thomas \(1992\)](#) and by comparison with other *A. spinidens* specimens. In total, 10 specimens were identified as *A. spinidens* (Fig. 1). The identified material is deposited in the "Iraci Paiva Coelho" entomological collection (CIPC - UEMA) and in the Hemiptera collection of the Department of Zoology at the Universidade Federal do Rio Grande do Sul (UFRGS). The stink bug was observed actively feeding on larvae of *Mocis latipes* (Guenée, 1852) (Lepidoptera: Noctuidae). This report in Brazil represents a new record of *A. spinidens* for the literature on rice and its geographic distribution attributed to the municipality of Itapecuru-Mirim, MA (Fig. 2).

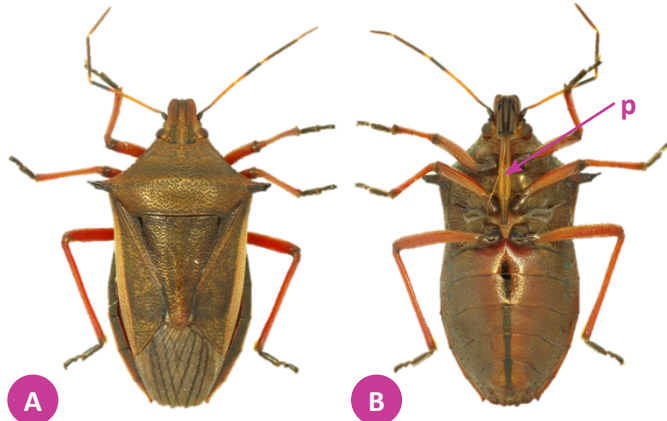


Figure 1. Female specimen of *Andrallus spinidens* (Fabricius, 1787) (Hemiptera: Asopinae) collected in a rice field in Itapecuru-Mirim, MA: A) dorsal view; B) ventral view, with detail of the robust labium (p), typical of Asopinae species.

To find additional specimens, those deposited in the Hemiptera collection at the Universidade Federal do Rio Grande do Sul (UFRGS) were reviewed. Surprisingly, a single specimen collected in the state of Roraima, Brazil (municipality not specified) was found (Fig. 2). Label information: "Roraima" "15/09/1981" "Alfredo" "Rice". This finding possibly represents the first historical record of the species in Brazil.

Our study's findings align with and complement similar research, such as the study by [Zibae et al. \(2012\)](#), which described *A. spinidens* as a predator of larvae of *Chilo suppressalis* (Walker, 1863) (Lepidoptera: Crambidae) and *Naranga aenescens* Moore, 1881 (Lepidoptera: Noctuidae) in rice in northern Iran. Recent research conducted in India by [Shanker et al. \(2017\)](#) reported the predatory potential of *A. spinidens* on larvae of *Spodoptera mauritia* (Boisduval, 1833) (Lepidoptera: Noctuidae) for pest management in rice. [Maheshwari et al. \(2023\)](#) highlighted that nymphs and adults of *A. spinidens* are polyphagous predators of lepidopteran larvae in rice, corn, and sugarcane crops:

Helicoverpa armigera (Hübner, [1808]), *Spodoptera litura* (Fabricius, 1775), *Mythimna separata* Walker, *Spodoptera frugiperda* (J.E. Smith, 1797) (Lepidoptera: Noctuidae), *C. suppressalis*, *Melanitis leda* (Fabricius, 1758) (Lepidoptera: Nymphalidae), and *Spilosoma obliqua* (Walker, 1885) (Lepidoptera: Arctiidae). Additionally, [Pal et al. \(2023\)](#) in their compilation of Asopinae species in India, covering 30 species in 17 genera, highlighted five predatory stink bug species, including *A. spinidens* as a potential biological control agent for insect pests.

Andrallus spinidens was described from specimens collected in Ethiopia in 1787. However, the first record of the species in the American continent occurred only in 1870, by Carl Stål, in Mexico ([Thomas 1994](#)). In the United States, the species was listed only in 1988, in Louisiana and Texas ([Henry & Froeschner 1988](#)). In Florida, the predator was also found in 1988, feeding on *M. latipes* in sugarcane plantations ([Mead & Eger 1992](#)), the same prey species we recorded in rice crops. In South America, the first record of *A. spinidens* dates to 1970, with a single specimen found in Valle del Cauca, Colombia ([Castro-Huertas et al. 2022](#)). Therefore, the specimen from Roraima cited here is the second in the historical line of records for the species in South America.

The discovery of live adult specimens of *A. spinidens* in Brazil suggests a possible establishment of the species in the municipality of Itapecuru-Mirim, MA. However, due to the lack of historical data on the species in the country, it is not possible to determine the origin of the species' presence in Brazilian territory, whether it is native, accidentally introduced, or migrated. Nevertheless, given the high flight capacity observed in some Asopinae species ([Alves et al. 2019](#)), and the species' wide distribution worldwide, the hypothesis that the active population highlighted in this study may have originated from nearby countries where the species occurs should be considered.

Considering the generalist predatory behavior of *A. spinidens*, the rice cultivation, and the diversity of other crops in Itapecuru-Mirim, it is recommended the monitoring of the species as an important step for managing larvae of *M. latipes* and other lepidopterans present in the area. This study contributes to updating the list of predatory pentatomid species found in rice fields in the state of Maranhão, as reported by [Souza et al. \(2015\)](#). It is important to note that taxonomic surveys associated with taxon recognition are fundamental for future biological control programs ([Shimbori et al. 2023](#)).

Additionally, further studies should be conducted to understand the population dynamics of *A. spinidens* during the growing season, as well as the habitats used during periods when rice cultivation is inactive. Furthermore, the predation potential of the species reported here should also be studied under local environmental conditions, both in the laboratory and in the field, to explore its effectiveness and application as a biological control agent in different agricultural systems.

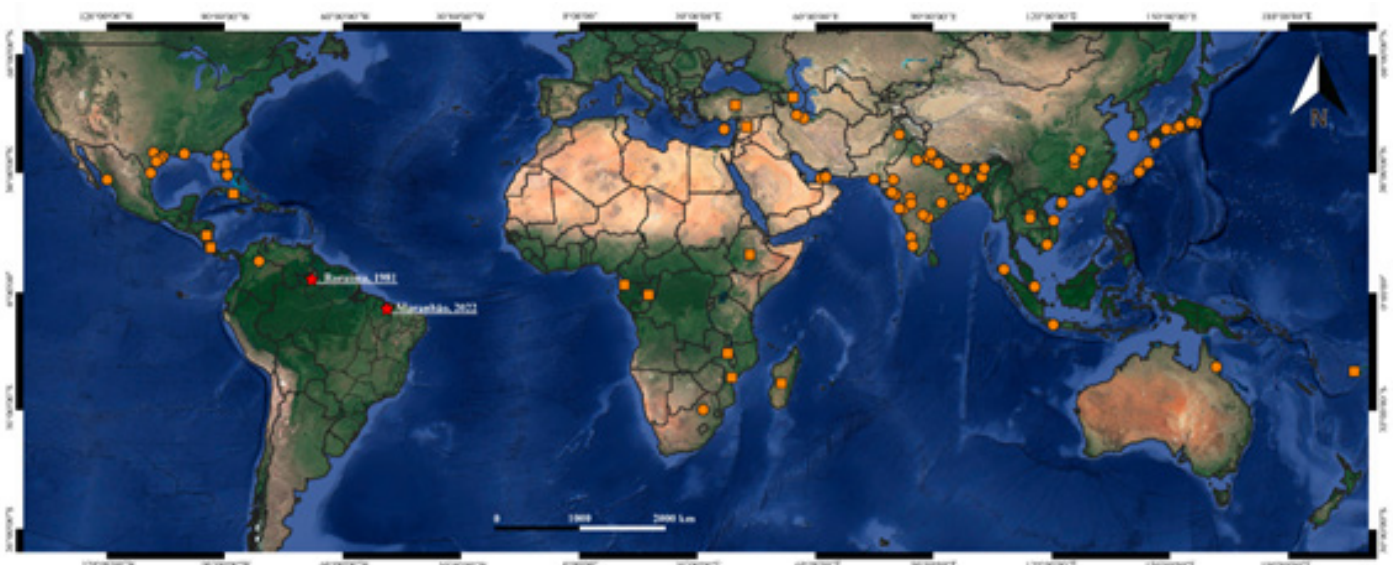


Figure 2. Distribution of *Andrallus spinidens* (Fabricius, 1787) (Hemiptera: Asopinae). Orange circles indicate Research-Grade observations from iNaturalist, while orange squares mark additional countries recorded by [Thomas \(1994\)](#). Red stars highlight the historical 1981 record from Roraima, Brazil, and the new records from Itapecuru-Mirim, Maranhão, Brazil.

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Authors' Contributions

MHFL: Investigation, Data curation, formal analysis and Validation, Writing – review & editing; JG: Validation, Writing – review & editing; LDB: Validation, Writing – review & editing; RB: Data curation, formal analysis and Validation, Writing – review & editing; PLERC: Investigation; JVSC: Investigation; RSG-J: Investigation; ECCA: Investigation; APL: Investigation; JRS: Investigation, Data curation, formal analysis and Validation, Writing – review & editing; JISA: Data curation, formal analysis and Validation, Writing – review & editing.

Conflict of Interest Statement

The authors declare no competing interests.

Ethical Approval

This study did not involve human participants or vertebrate animals. Therefore, ethical approval was not required.

Data Availability

The data supporting the findings of this study are available within the article.

Generative AI Statement

The authors declare that generative artificial intelligence tools were used only for language revision and did not contribute to the scientific design, data analysis, or interpretation of the results.

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2p199-202

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