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Scientific Article

First record of *Aricoris campestris* (Bates, 1868) Lepidoptera: Riodinidae in pitaya in northeastern Brazil

Primeiro registro de *Aricoris campestris* (Bates, 1868) Lepidoptera: Riodinidae em pitaya no nordeste brasileiro

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ABSTRACT - Pitaya (*Selenicereus* spp.) is a tropical fruit tree belonging to the Cactaceae family, native to the tropical regions of Central and South America. Your cultivation has been considered promising due to its organoleptic characteristics and its high acceptance in the market. However, little information is available about pests associated with pitaya in northeastern Brazil. Here, we aim to communicate the identification and record of the occurrence of a pest insect in a pitaya plantation in the Caatinga. Caterpillars of this lepidopteran were collected from parts of pitaya plants, in January 2021, in the municipality of São João do Cariri, PB (7° 23'27" S, 36°31'57" W), placed in plastic containers and transported to the Invertebrates Laboratory of the Biosciences Department at the Agricultural Sciences Center of the Federal University of Paraíba, in the municipality of Areia, PB. Under laboratory conditions, the caterpillars were fed with pitaya shoots and kept in an environment with controlled conditions of temperature and humidity. When they reached the pupal stage, they were transferred to a cage and kept until the adults emerged. Identification of the adult was carried out by a specialist, by comparison with specimens from the Reference Collection of the Laboratory of Ecology and Interactions of Insects of the Caatinga (CLEIIC), belonging to the Federal University of Campina Grande, Patos, PB. The lepidopteran is *Aricoris campestris* (Bates, 1868), belonging to the Riodinidae family, Nymphidiini tribe, which also attacks other cacti in the region and has already been recorded in other areas in northeastern Brazil.

Keywords: Caatinga. Cactaceae. Pest insect. *Selenicereus* spp.

RESUMO - A pitaya (*Selenicereus* spp.) é uma frutífera pertencente à família das cactáceas, nativa das regiões tropicais da América Central e do Sul. O cultivo dessa fruta vem sendo considerado promissor devido às características organolépticas e sua alta aceitação no mercado, que desperta o interesse dos produtores. No entanto, há poucas informações disponíveis sobre pragas associadas à pitaya no nordeste brasileiro. Assim, objetivou-se nesse estudo divulgar a ocorrência de *Aricoris campestris* em um plantio de pitaya na Caatinga. As lagartas desse lepidópetero foram coletadas diretamente de partes das plantas de pitaya, no mês de janeiro de 2021, no município de São João do Cariri - PB (7°23'27" S, 36° 31'57" W), com auxílio de uma pinça, acondicionadas em recipientes plásticos e transportadas para o Laboratório de Invertebrados do Departamento de Biociências no Centro de Ciências Agrárias da Universidade Federal da Paraíba, no município de Areia - PB. No laboratório, as lagartas foram alimentadas com brotos de pitaya e mantidas sob condições controladas de temperatura e umidade. Ao atingirem a fase de pupa, foram transferidas para uma gaiola de criação, enquanto aguardou-se a emergência dos adultos, para posterior identificação. A identificação do adulto foi realizada por especialista, por comparação com exemplares da Coleção de referência do Laboratório de Ecologia e Interações de Insetos da Caatinga (CLEIIC), Universidade Federal de Campina Grande, Patos, PB. O lepidóptero trata-se de *Aricoris campestris* (Bates, 1868), pertencente à família Riodinidae, tribo Nymphidiini.

Palavras-chave: Caatinga. Cactácea. Insetos-praga. *Selenicereus* spp.

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INTRODUCTION

Pitaya (*Selenicereus* spp.), also called dragon fruit, belongs to the cactus family, native to the tropical regions of Mexico, Central America, and South America. Its cultivation has been considered promising, due to the characteristics of sweet and smooth flavor, as well as firm pulp full of seeds with laxative action, which sparks interest from producers, who also find high acceptance in consumer markets (MUHAMMAD et al., 2014). In addition, it has pharmacological value and has been reported to help fight cancer, obesity, type II diabetes and other metabolic syndromes, due to the presence of phytochemicals with bioactive compounds, such as betacyanins, phenolic compounds, polysaccharides and terpenoids (JOSHI; PRABHAKAR, 2020; SONG et al., 2016).

The most cultivated and consumed species are *Selenicereus monacanthus* (formerly *Hylocereus polyrhizus*) and *Selenicereus undatus*, which have red skin and pink and white flesh, respectively, and *Selenicereus megalanthus*, which has yellow skin and white flesh (JIANG et al., 2021). In Latin America, the production of this fruit is distributed in Mexico, Costa Rica, Venezuela, Panama, Uruguay, Brazil and Colombia (SATO et al., 2014). At the national level, in 2017 Brazil produced about 1,500 tons of pitaya in 3,086 agricultural establishments (IBGE, 2019). Its production is currently concentrated in the Southeast region, with about 815 tons produced in 2017, contributing with 54.42% of the national production.

The Northeast region still has low participation in the national production, but the production is expected to increase in the coming years, as a result of research and development of cultivars adapted to the edaphoclimatic conditions of the region (FALEIRO; JUNQUEIRA, 2021). According to the 2017 census, 84.4 tons were produced in the state of Paraíba, thus occupying the 7th position in the national ranking (IBGE, 2019).

Although there has been an expansion of commercial cultivation of this fruit tree in Brazil in recent years, one of the main obstacles that harm and burden its cultivation is the deleterious action of pest insects, reducing its yield and altering both the vegetative parts of the plants and the quality of the fruit, depreciating its commercial value (MARQUES et al., 2012). The appearance of fruits plays a fundamental role, being one of the characteristics that directly influence their market acceptance, so they must be free of damage, for instance injuries caused by the attack of pest insects (COSTA et al., 2016). Thus, the objective of this study was to communicate the record of occurrence of *Aricoris campestris* in a pitaya plantation in the Caatinga.

MATERIAL AND METHODS

In this study, caterpillars were collected directly from shoots and other parts of pitaya plants of the species *Selenicereus monacanthus* (Lem.) D.R.Hunt, *S. costaricensis* (Weber) D.R.Hunt and *S. undatus* (Haw.) D.R. Hunt), in January 2021, in the municipality of São João do Cariri, PB, Brazil (7°23'27" S, 36°31'57" W), a region in which annual rainfall varies from 400 to 500 mm, with more than 60% concentrated in February, March and April (ALVARES et al., 2013). This region has historically been occupied by agricultural fields, extensive goat farming, and exploratory removal of native vegetation, and is currently characterized as a desertification hotspot in the Brazilian semi-arid region. High abundance of pests and intensity of herbivory damage in guava trees have recently been demonstrated on this farm (ARAUJO; NASCIMENTO; BRITO, 2022) (Figure 1).

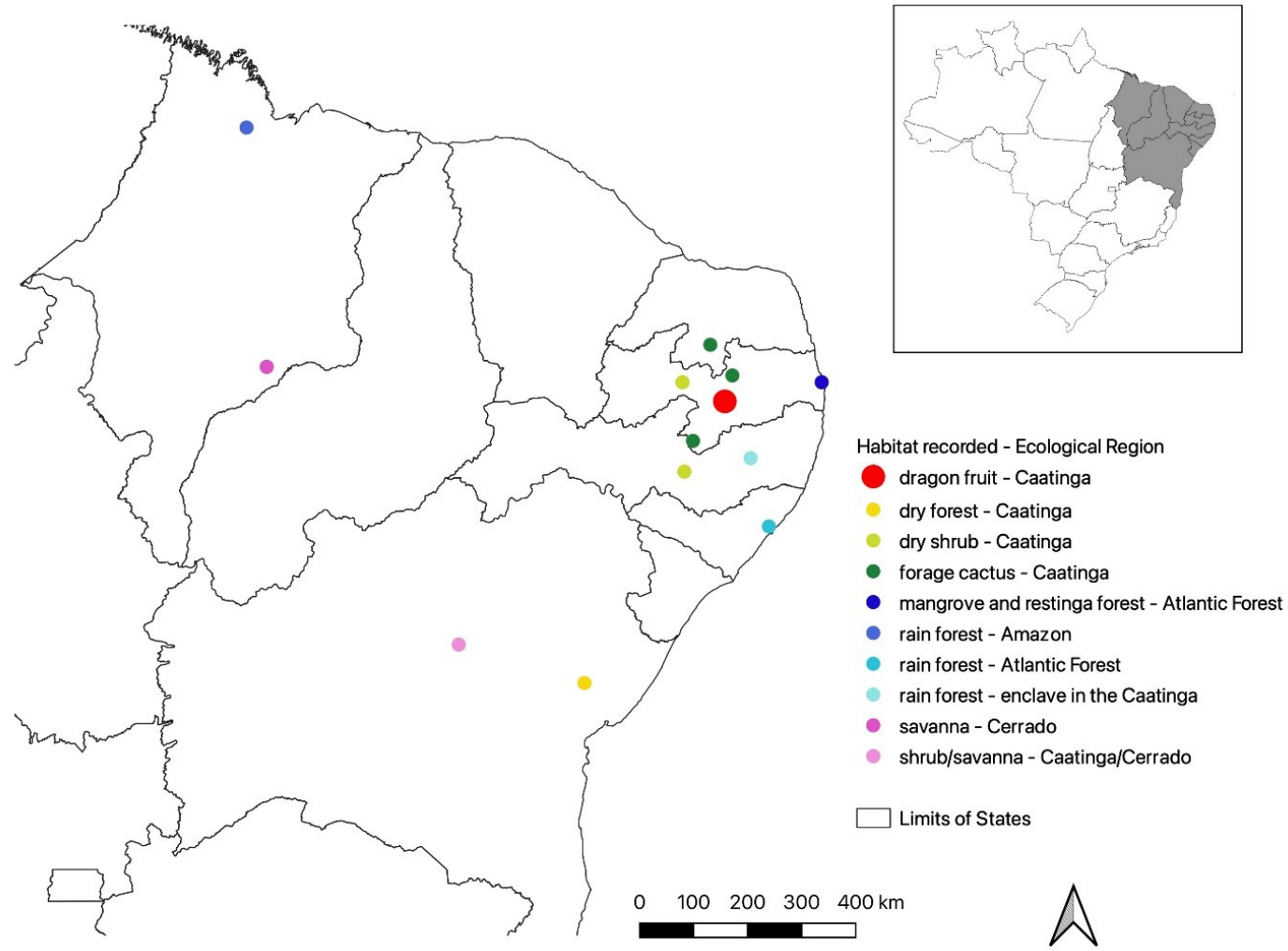

Figure 1. Geographic location of the occurrence of *Aricoris campestris* in pitaya in the municipality of São João do Cariri, PB, Brazil, as well as in other hosts in localities of the Brazilian Northeast.

Caterpillars were collected with the aid of tweezers, placed in transparent plastic containers, with small holes in the upper part and transported to the Invertebrates Laboratory of the Department of Biosciences at the Center for Agrarian Sciences of the Federal University of Paraíba (CCA/UFPB), in the municipality of Areia, PB, Brazil. In the laboratory, the caterpillars were fed with pitaya sprouts and kept in an environment with controlled conditions of temperature (25±1 °C) and humidity (70±10%). When they reached the pupal stage, they were transferred to a cage made of galvanized wire and covered with voile fabric, where they were kept until the emergence of adults. Adult specimens were photographed on the dorsal and ventral surfaces and sent to the Laboratory of Ecology and Interactions of Insects of the Caatinga, where they were identified by a specialist, by comparison with specimens from the collection of the aforementioned laboratory.

RESULTS AND DISCUSSION

The species found belongs to the Riodinidae family, Nymphidiini tribe, and consists of the butterfly *Aricoris campestris* (Bates, 1868) (Lepidoptera: Riodinidae). The larval stage (Figure 2A) is characterized by a light green color and/or yellowish shades, with a whitish stripe on the back, presence of thin and light to transparent bristles along the body, and a darkened head. In the pupal stage (Figure 2B), the species presents itself in the obtect form (hardened cocoon), with dark gray and cream spots on the ventral distal part. In the adult stage (Figure 2C), *A. campestris* is a butterfly with dark orange color on the dorsal surface with denser black spots on the distal two-thirds of the forewings, marginal area of the hindwings with orange oval spots and black spots between the veins, and clavate antennae. On the ventral surface, the forewings are orange at the base with black spots and some white and darkened spots at the margin. Hindwings have stripes of dark and light spots, with black dots between the veins at the margin.

In the larval stage, *A. campestris* feeds mainly on the cladode shoots and/or fruits of pitaya, scraping them in its early stages, which causes tissue necrosis (Figure 3A). When they reach a larger size, they perforate the vegetative and reproductive parts, causing the formation of galleries, leading to deeper damage to flattened cladodes and fruits (Figure 3B).

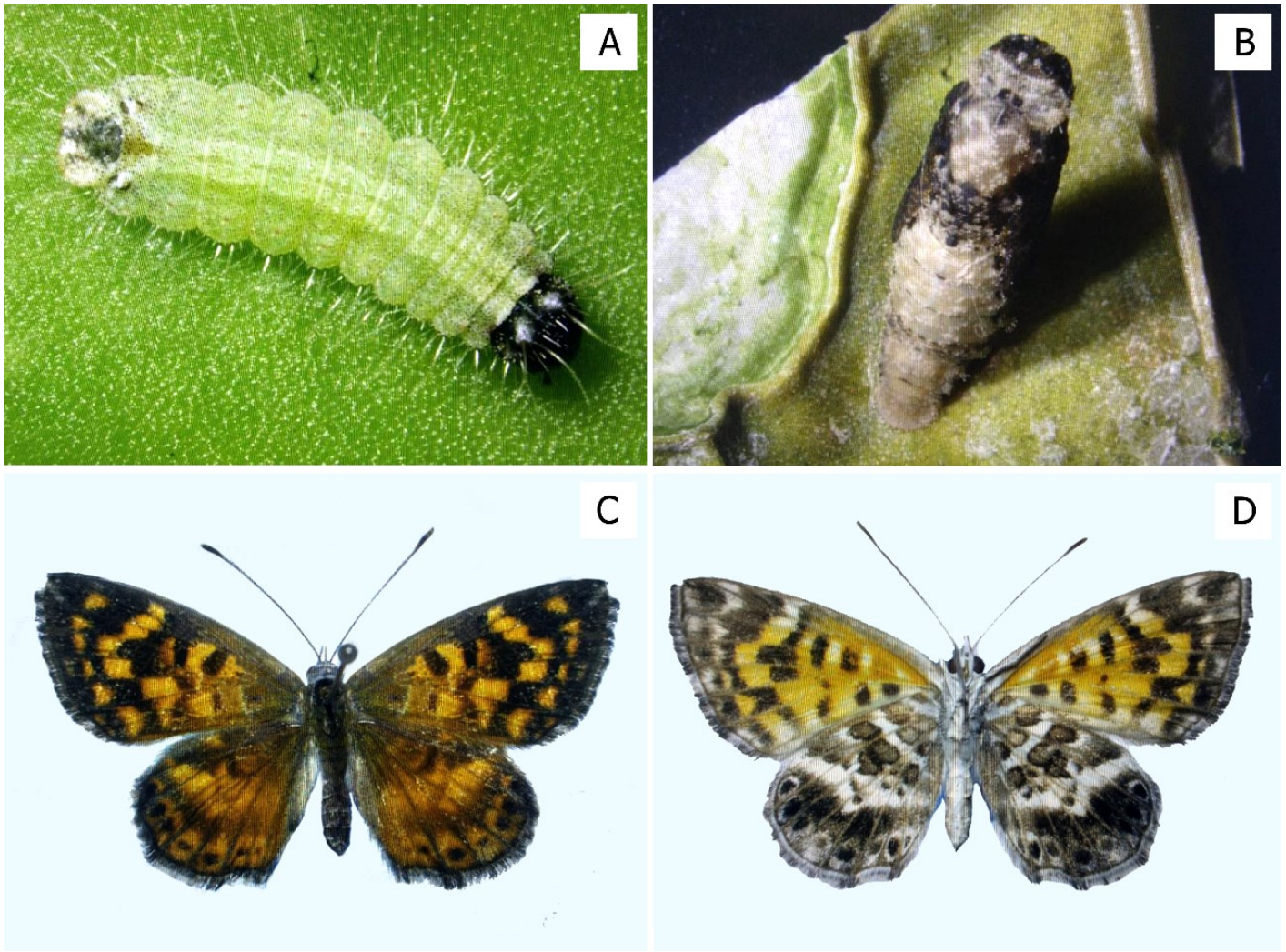

Figure 2. *Aricoris campestris* in the 4th larval instar (A), pupal stage (B) and adult on the dorsal surface and (C) ventral surface (D) found in pitaya, in São João do Cariri, PB, Brazil.

Figure 3. Initial damage with formation of galleries in flattened cladode of pitaya caused by the larvae of *Aricoris campestris* (A). Formation of galleries caused by *A. campestris* consumption in pitaya in the municipality of São João do Cariri, PB, Brazil (B).

There are records of the occurrence of *A. campestris*, both in forest areas and in agricultural environments, in cochineal cactus (*Nopalea cochenillifera*) in the Brazilian Northeast (SOUZA et al., 2018), in a forest area in the Catimbau National Park in the Pernambuco state (NOBRE; SCHLINDWEIN; MIELKE, 2008), in the Amazon biome and in the Cerrado of Maranhão (MARTINS et al., 2017), in the Alagoas state in a forest environment (BEZERRA et al., 2021), and in the Caatinga and Atlantic Forest areas of the Bahia state (DANTAS; ZACCA; BRAVO, 2021) (Figure 1).

In the Paraíba state, in addition to the study conducted by Souza et al. (2018) reporting the occurrence of *A. campestris* in cochineal cactus (*N. cochenillifera*), this species has also been reported in the Restinga de Cabedelo National Forest (MEDEIROS et al., 2021) and in a remnant of semi-urban Caatinga in the Sertaneja Depression of Patos (FERREIRA-JÚNIOR, 2021).

This species is common in open vegetation and with a common distribution in the Northeastern semi-arid region (ZACCA; BRAVO, 2012; KERPEL et al., 2014; RAFAEL et al., 2017). This lepidopteran also has important symbiotic interactions with ants of the genus *Solenopsis* (Hymenoptera: Formicidae) (KAMINSKI; CARVALHO-FILHO, 2012).

CONCLUSION

This is the first record of *Aricoris campestris* (Riodinidae: Nymphidiini) using pitaya in the larval stage and the second record of this species feeding on Cactaceae in Brazil and in the Northeast region, thus revealing the cause of attacks on plants of this cultivar in the municipality of São João do Cariri in Paraíba.

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