

## First report of predation on floral visitors by crab spiders on *Croton selowii* Baill. (Euphorbiaceae)

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**RESUMO** – (Primeiro registro de predação de visitantes florais por aranhas-caranguejo em *Croton selowii* Baill. (Euphorbiaceae)). Na literatura tem sido amplamente registrado que aranhas Thomisidae predam visitantes florais de várias espécies de planta. Neste estudo nós apresentamos observações de *Croton selowii* Baill. (Euphorbiaceae), uma espécie monóica, abrigando aranhas Thomisidae em uma área de restinga de Pernambuco, Brasil. A espécie é visitada por invertebrados de várias ordens e vários deles são predados pelas aranhas, principalmente espécies de Diptera. As aranhas apresentaram um comportamento de esfregar as pernas dianteiras dentro das flores, o que pode ser interpretado como uma estratégia de camuflagem das pernas. *Croton selowii* parece representar um bom sítio de forrageamento para essas aranhas, pois possui um sistema de polinização generalista, sendo visitado por ampla gama de invertebrados e floresce em um período de baixa disponibilidade de flores na área.

**Palavras-chave:** polinização, predação, restinga

**ABSTRACT** – (First report of predation on floral visitors by crab spiders on *Croton selowii* Baill. (Euphorbiaceae)). In the literature it has been extensively mentioned that crab spiders (Araneae: Thomisidae) prey on floral visitors of several plant species. Here we present observations of *Croton selowii* Baill. (Euphorbiaceae), a monoecious species harboring individuals of crab spiders in an area of coastal vegetation of Pernambuco state, Brazil. The species is visited by several invertebrate orders, and some of them were preyed upon by the spiders, mainly Diptera species. The spiders rubbed the forelimbs within the flowers, which may constitute a strategy to camouflage these structures. *Croton selowii* seems to represent a suitable foraging site for the spiders, because it has a generalist pollination system (thus being visited by a wide range of invertebrate species) and blooms in a period of low flower resource availability in the area.

**Key words:** pollination, predation, coastal vegetation

### Introduction

The crab spiders (Araneae: Thomisidae) prey on floral visitors and present the sit-and-wait strategy: they remain camouflaged in the inflorescences waiting for invertebrates (Dukas & Morse 2003; Robertson & Maguire 2005). There is evidence that the presence of crab-spiders can reduce flower visitation rates (Suttle 2003; Reader *et al.* 2006), and diminish pollinator density, causing a negative impact on plant reproductive success (Dukas & Morse 2003; Gonçalves-Souza *et al.* 2008). However, other studies discuss the beneficial effects of these flower-dwelling spiders on their host plant, such as predation on phytophagous herbivores, which can have a positive influence on seed production (Romero & Vasconcellos-Neto 2004).

Plant species of some angiosperm families were recorded as being occupied by crab spiders, such as Asteraceae (Romero & Vasconcellos-Neto 2003), Asclepiadaceae (Kareiva *et al.* 1989), Fabaceae (Chien & Morse 1998) and Rosaceae (Romero & Vasconcellos-Neto 2004), but to date, there are no records of this interaction in *Croton* L. (Euphorbiaceae) species. This short communication aims to describe general aspects of the interaction between crab spiders, *C. selowii* flowers and their floral visitors in an area of coastal vegetation of Pernambuco, Brazil.

### Material and methods

*Croton selowii* Baill. is a monoecious shrub species with restricted distribution in coastal formations of Brazil (J. S. Silva, pers. comm.). In the Reserva Particular do Patrimônio Natural “Nossa Senhora do Outeiro de Maracaípe”, Ipojuca, Pernambuco, Brazil (08°31'48”S; 35°00'148”W), it occurs mainly on forest edges and gaps. Naturalistic observations were done in September 2008. To observe spiders’ behavior, twenty flowering individuals of *C. selowii* were observed between 9:00 and 11:00 h, and between 14:00 and 16:00 h (total of 80 h). Floral visitors were collected and identified to the family level. Floral scent was recorded and the presence of regions of odor emission was tested in 20 flowers from different individuals and populations, using the neutral red technique (Dafni 1992). Forty-five individuals from different populations were checked for the presence of spiders, which were collected and identified by specialists.

### Results and discussion

Flowers were visited by 21 morpho-species of several invertebrate orders, such as Hymenoptera (five Sphecidae, three Vespidae, one Pompilidae, two Apidae, one Megachilidae, one Adrenidae and one Formicidae morph species), Lepidoptera (two Hesperidae), Diptera (two Bombiliidae, one Muscidae and one Syrphidae) and Heteroptera (one Coreidae). A total of 31 individuals (69%) harbored individuals of *Misumenoides* cf. *paucispinosus*, *Misumenops pallens* (Keyserling 1880) and/or *Misumenops* sp. (Araneae: Thomisidae), which prey on floral visitors, mainly on flies. It was also observed predation on bees and the phytophagous species of Coreidae. All visitors that were preyed upon touched the anthers or the stigma, being considered as potential pollinators.

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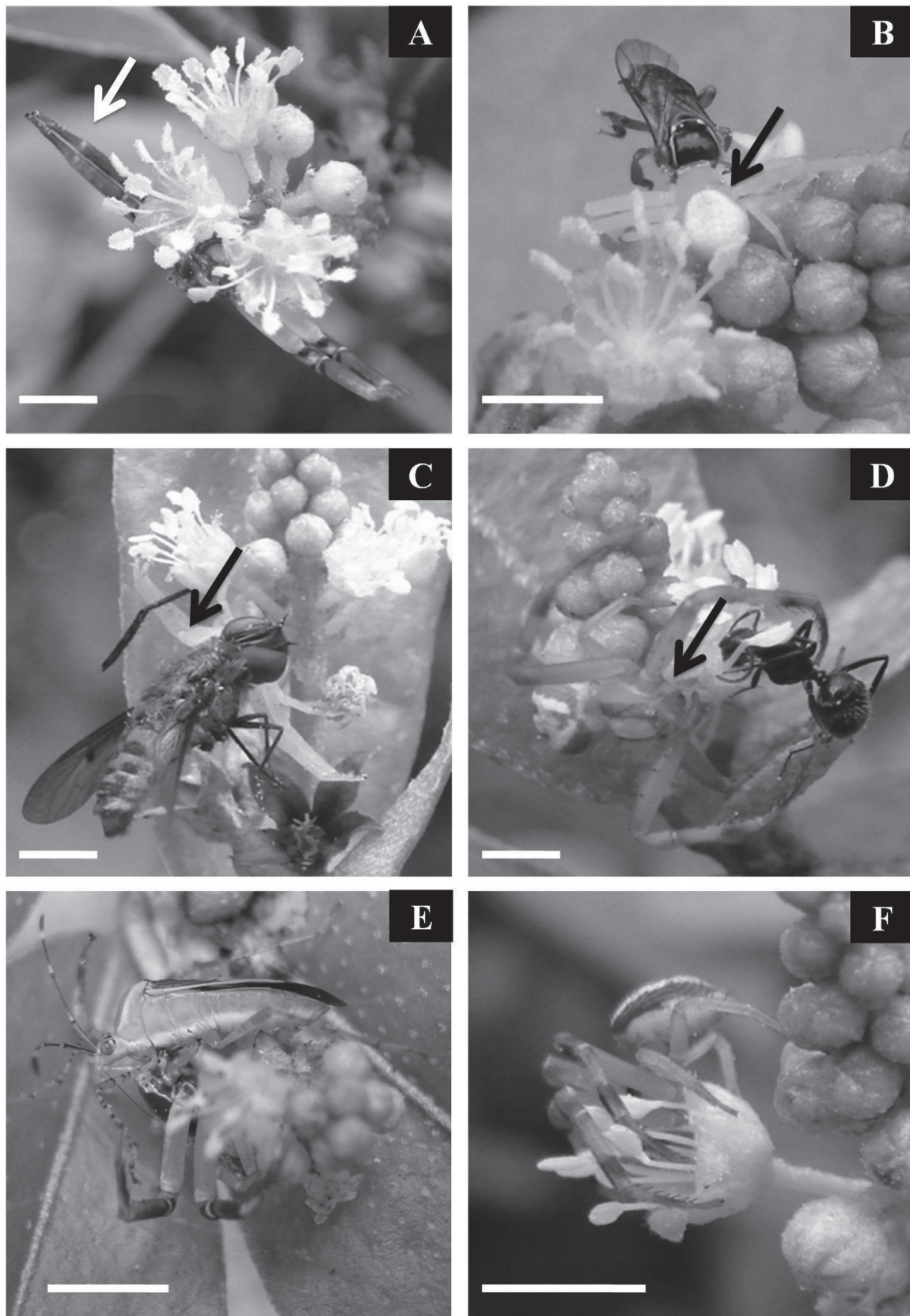


Figure 1. Crab spiders (Thomisidae-Araneae; arrows) on flowers of *Croton selowii* Baill. (Euphorbiaceae) in an area of coastal vegetation in Ipojuca, PE, Brazil. (A) *Misumenoides* cf. *paucispinosus* camouflaged on an inflorescence. (B-C) *Misumenops pallens* (Keyserling 1880) preying on a bee and a Syrphidae species, respectively. (D) predation attempt of *Misumenops* sp. on *Camponotus* sp.. (E) *M.* cf. *paucispinosus* preying on a Coreidae species. (F) *Misumenops* sp. collecting floral substances. Bars = 0,3cm.

In most observations the spiders positioned the forelimbs perpendicularly outstretched to their bodies' axis (Fig. 1A). They resemble inflorescence structures, being easily confused with buds and flowers (Fig. 1). Furthermore, it was observed that some individuals introduce a forelimb within the flower and rub on the opposite forelimb (Fig. 1F). When a visitor approaches the inflorescence, the spider attacks and consumes it immediately (Fig. 1B-E). Most floral visitors apparently did not perceive the spider's presence, but a bee species (Apidae) gave up the visit when it detected the spider, similarly to what was recorded by other studies (e.g., Dukas & Morse 2003; Robertson & Maguire 2005).

Studies show that these Thomisidae spiders (including species of *Misumenoides* F.O.P-Cambridge 1900 and *Misumenops* F.O.P-Cambridge 1900) can modify, gradually and reversibly, their body color to resemble the flowers, a behavior that avoids their recognition by floral visitors (Schmalhofer 2000), and even may enhance flower attraction (Heiling *et al.* 2005). Some studies suggest that the forelimbs seem to be the spider trait recognized by pollinators (mainly hymenopterans), thus both the spider position in the plant and the apparent use of floral substances observed here seem to constitute strategies to camouflage the forelimbs (Gonçalves-Souza *et al.* 2008). *Croton selowii* flowers present a citric fragrance and regions of odor emission distributed on sexual elements.

*Croton selowii* seems to represent a suitable foraging site for the spiders in the study area. It has a generalist pollination system (thus being visited by a wide range of invertebrate species) and blooms in a period of low flower resource availability in the area (Medeiros *et al.* 2006). Consequently, it presents high visitation rates, mainly in the morning (pers. obs.). This short communication is, to our best knowledge, the first report of crab spiders preying on pollinators of *C. selowii*.

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