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Predation of *Oxyrhopus guibei* Hoge & Romano, 1977 by *Nephilingis cruentata* (Fabricius, 1775), an invasive African spider in Brazil

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Resumo

Registros de história natural são essenciais para compreender interações ecológicas e a biodiversidade, especialmente diante de espécies invasoras e seus potenciais impactos. No Brasil, *Nephilingis cruentata* é uma espécie invasora estabelecida, com hábitos predominantemente urbanos e periantrópicos, cuja dieta consiste principalmente de invertebrados, embora existam registros ocasionais de vertebrados. Neste estudo, apresentamos o primeiro registro de predação de *Oxyrhopus guibei* por *N. cruentata* e o primeiro registro de predação de serpente por essa aranha. O evento ocorreu no sudeste do Brasil, onde uma fêmea adulta capturou em sua teia um juvenil da serpente. Dados morfométricos de ambos os espécimes indicam que, embora rara, essa aranha pode subjugar presas vertebradas relativamente grandes. Este registro amplia o conhecimento sobre a história natural das espécies e reforça a importância de documentar hábitos alimentares de organismos invasores e seus potenciais impactos sobre a biodiversidade local.

Palavras-chave

Araneidae, aranhas invasoras, Dipsadidae, interações tróficas, invasão biológica, predação de serpentes.

Abstract

Natural history records are essential for understanding ecological interactions and biodiversity, particularly in the context of invasive species and their potential impacts. In Brazil, *Nephilingis cruentata* is an established invasive species with predominantly urban and peri-urban habits whose diet consists mainly of invertebrates, although occasional records of vertebrate prey exist. Here, we report the first record of *Oxyrhopus guibei* being preyed upon by *N. cruentata* and the first record of snake predation by this spider species. The event was documented in southeastern Brazil, where an adult female spider captured a juvenile snake in its web. Morphometric data obtained from both specimens indicate that, although uncommon, *N. cruentata* is capable of subduing relatively large vertebrate prey. This record expands current knowledge of the natural history of both species and highlights the importance of documenting the feeding habits of invasive organisms and their potential impacts on local biodiversity.

Key words:

Araneidae, Dipsadidae, invasive spiders, biological invasion, snake predation, trophic interactions.

Natural history records constitute crucial information for numerous biological approaches, providing a foundation for understanding biodiversity and its interspecific relationships (Greene & Losos, 1988; Sawaya et al., 2008). Documenting interactions, such as predator-prey relationships, allows the reconstruction of evolutionary histories, the testing of stochastic feeding models, and the understanding of ecological interactions among species (Schmitz et al., 2015; Grundler & Rabosky, 2020; Massim & Neves, 2026).

This information becomes even more relevant when dealing with species considered invasive, due to the significant impacts they may potentially cause to the environment, the economy, and public health (Pimentel et al., 2001; Pimentel et al., 2005; Abegg et al., 2024). Such data make it possible to monitor the dynamics, evolution, and consequences that established populations may have on the balance of local biodiversity (Cordero et al., 2023). Disturbances have already been documented in different contexts and demonstrate that, if not previously recognized and monitored as potential threats, they may trigger serious environmental problems (Simberloff et al., 2013).

In Brazil, the African-origin spider *Nephilingis cruentata* (Araneae: Araneidae) is considered an invasive species, although the region and country of origin, as well as the location where the first populations were established, remain unknown. Apparently, as with *Hemidactylus mabouia* Moreau de Jonnès, 1818 (Sauria, Gekkonidae) (Vanzolini, 1978), its introduction dates back to the period of slavery in Brazil, which began in 1535 in Bahia (Gomes, 2019). Today, its distribution spans tropical Africa, and it has been introduced to Brazil, Colombia, Paraguay, and the Indian Ocean islands (World Spider Catalog, 2026). In Brazil, *N. cruentata* is well established, occupying southern, southeastern, as well as the southern part of the country's Northeast region, with predominantly perianthropic habits (Kuntner, 2007). In general, individuals establish their refuges along walls or under the eaves of buildings, occasionally connecting silk threads to nearby tree trunks or close to the ground (Levi & Eickstedt, 1989).

Although *N. cruentata* opportunistically feeds on vertebrates (Peloso & Sousa, 2007; Diniz, 2011), its diet consists primarily of invertebrates. Given that significant knowledge gaps regarding invertebrates still exist (Cardoso et al., 2011), it is difficult to comprehensively assess the ecological impacts of this spider's introduction on the native fauna. While predatory events involving vertebrate species have been documented for *N. cruentata* (e.g., *Todirostrum cinereum,* Peloso & Sousa, 2007; *Hemidactylus mabouia*, Diniz, 2011), additional records regarding its diet may expand knowledge and support future studies aimed at assessing its potential impacts on local biodiversity, whether deleterious or not. In this study, we present a novel record of predation by *N. cruentata* on the false coral snake *Oxyrhopus guibei* (Serpentes: Dipsadidae), a nocturnal, terrestrial snake that typically inhabits open areas and forest edges, with a diet based primarily on rodents and lizards (Sazima & Abe, 1991; Sazima & Haddad, 1992; Torello-Viera & Marques, 2017). The species is widely distributed across South America, with records in Argentina, Bolivia, and Paraguay, and Brazil (Nogueira et al., 2019).

On April 4, 2025, a predation event involving a *N. cruentata* and an *O. guibei* was recorded (Fig. 1). The classification of the event as predatory was based on the condition of the snake and the behavior of the spider at the time of observation. The snake was subdued, with its body coiled. The spider remained in prolonged contact with the prey, with its chelicerae and mouthparts inserted into its body, which exhibited tissue damage in the corresponding region. Additionally, the observation occurred during the morning, which is neither the foraging period of *N. cruentata*, nor and the main activity peaks of *O. guibei*. This detail, along with the conditions described above, demonstrates the event had already been occurring for some time. The spider and the snake were identified following Levi & Eickstedt (1989) and Zaher & Caramaschi (1992), respectively. The event occurred on a web approximately 90 cm long, extending

between an elevated deck and the ground, at a residence in the Ecovila Clareando gated community, municipality of Piracaia, state of São Paulo, Brazil (23°00′10.6″ S, 46°53′44.6″ W; ~900 m elevation; Atlantic Forest biome). Morphometric measurements were obtained using a digital caliper (0.01 mm) and a precision scale (0.1 g). The sex of the *O. guibei* was determined using a snake sexing probe, while the sex of the *N. cruentata* was determined based on morphological characteristics, given the species evident sexual dimorphism (Kuntner, 2007). The adult female *N. cruentata* had a total length of 19.62 mm and a mass of 0.9 g. The juvenile male *O. guibei* had an approximate total length of 290 mm (snout-vent length = 235 mm; tail length = 55 mm), with a head length of 8.11 mm, head width of 6.02 mm, and a mass of 2 g. The snake's length measurements are approximate, as about 50 mm of its body exhibited severe tissue damage, preventing precise measurement of that region. The specimens were deposited in the "Alphonse Richard Hoge" Herpetological Collection (IBSP 95250; curator: Felipe G. Grazziotin) and the Arachnological Collection (IBSP 348333; curator: Antonio D. Brescovit), both at the Instituto Butantan, São Paulo, São Paulo, Brazil.

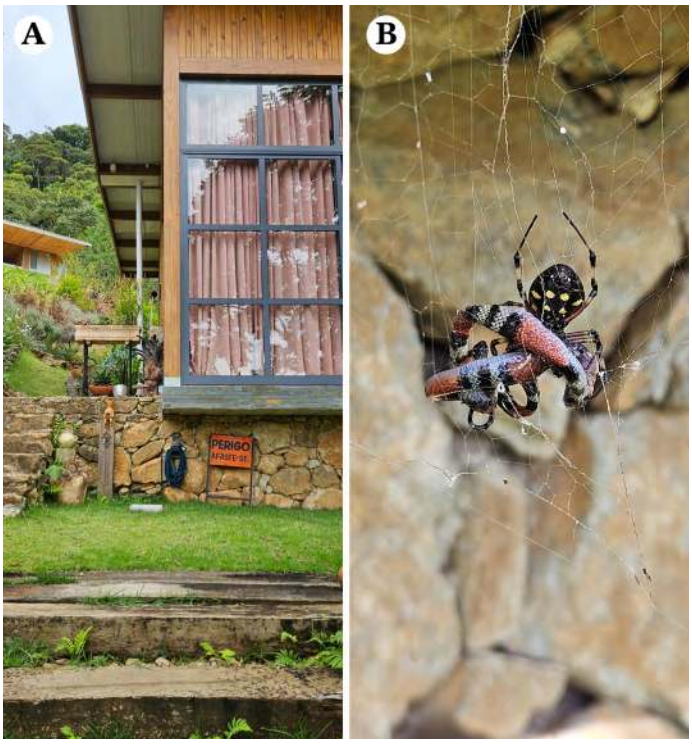


Figure 1. Predation of the *Oxyrhopus guibei* by *Nephilingis cruentata*. A- Location where the predatory event occurred. B- An adult female of *N. cruentata* preying on a male juvenile of *O. guibei*.

Although cases of snakes serving as prey for spiders have already been recorded (McCormick & Polis, 1982; Nyffeler & Gibbons, 2021), the present study documents the first record of *O. guibei* being preyed upon by a spider, as well as the first record of snake predation by *N. cruentata*, expanding knowledge of predator-prey interactions between snakes and spiders. This record also reinforces the importance of quantifying, characterizing, and monitoring the feeding habits of invasive species, as this information allows the identification of potentially affected species and provides a basis for assessing possible impacts on native populations and ecological interactions (Doherty et al., 2016). Our results, together with previous records (Peloso & Sousa, 2007; Diniz, 2011), demonstrate that these spiders are capable of capturing and feeding on prey significantly larger than themselves, possibly facilitated by the large extent of their webs, which are often positioned in strategic locations and may increase the effectiveness of capturing such prey (Nentwig & Wissel, 1986; Nyffeler & Gibbons, 2022). In addition, these spiders may represent a problem even when capture occurs incidentally, as various species, both vertebrates and invertebrates, may become accidentally trapped, potentially generating additional negative impacts (Duca & Modesto, 2007; Peloso & Sousa, 2007; Jacomassa et al., 2015).

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