

SHORT COMMUNICATION

Once a prey, now a predator: an unusual record of a scorpion (Scorpiones: Chactidae) predated by a katydid (Orthoptera: Tettigoniidae) in the western Brazilian Amazon

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ABSTRACT

Orthopterans are an important component of the food chain. The species belonging to the order Orthoptera are herbivores or predators, and several behave as opportunistic predators. However, their predatory habits are not well understood. Here we report the predation of a *Chactopsis* sp. scorpion by a *Hyperomerus* sp. katydid in a fragment of terra firme forest in the western Brazilian Amazon. The specimens were found on a 60-cm tall bush. The scorpion showed spasmodic motions of the metasoma while it was being devoured by the katydid. This is the first report of a predator–prey interaction between an orthopteran and a scorpion in the Amazon biome. We believe that records of this type are important to allow a better understanding of predator–prey interactions in tropical invertebrate communities.

KEYWORDS: feeding habit; *Chactopsis*; *Hyperomerus*; Amazon rainforest; trophic interactions

Antes presa, agora predador: um registro incomum de predação de um escorpião (Scorpiones: Chactidae) por uma esperança (Orthoptera: Tettigoniidae) no oeste da Amazônia brasileira

RESUMO

Os ortópteros são um componente importante da cadeia alimentar. As espécies pertencentes a ordem Orthoptera são herbívoras ou predadoras, e muitas se comportam como predadores oportunistas. No entanto, seus hábitos predatórios não são bem compreendidos. Aqui nós relatamos a predação de um escorpião *Chactopsis* sp. por uma esperança *Hyperomerus* sp. em um fragmento de floresta de terra firme no oeste da Amazônia brasileira. Os espécimes foram encontrados em um arbusto de 60 cm de altura. O escorpião apresentou movimentos espasmódicos do metassoma enquanto era devorado pela esperança. Este é o primeiro relato de interação predador–presa entre um ortóptero e um escorpião no bioma Amazônia. Nós acreditamos que registros deste tipo são importantes por permitir um melhor entendimento das interações predador–presa em comunidades de invertebrados tropicais.

PALAVRAS-CHAVE: hábito alimentar; *Chactopsis*; *Hyperomerus*; floresta Amazônica; interações tróficas

Insects belonging to the order Orthoptera constitute an important food resource for several predators, including monkeys, birds, reptiles, amphibians, and several invertebrates (Nickle and Castner 1995; Naskrecki 2009). These insects also play a key role in several terrestrial ecosystems through their phytophagous habit, feeding on foliage and, in some cases,

also on plant roots and fungi (Nickle 2002; Resh and Cardé 2009). In addition to herbivory, some orthopteran species are considered to be predatory or, at least, opportunistic predators (O'Donnell 1993; Nickle 2002; Nickle 2007). For example, some species feed on hymenopteran eggs and larvae, small spiders, oligochaetes, aphids, other small invertebrates,

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and even small vertebrates (Resh and Cardé 2009; Morselli 2010; Godé *et al.* 2015; Young 2017). However, the predatory habits of orthopterans in the Neotropical region are not well documented (O'Donnell 1993; Woodrow *et al.* 2021). To the best of our knowledge, this is the first report on scorpion predation by an orthopteran in the Brazilian Amazon.

The interaction was observed on the night of June 16, 2020, during fieldwork in an area of terra firme forest (7°33'46.92"S; 72°42'52.26"W), in the municipality of Cruzeiro do Sul, state of Acre, Brazil, in the western Amazon region. We found a katydid female nymph (full length = 25 mm) feeding on a chactid scorpion (Figure 1) on a bush at 60 cm from the ground. The scorpion was trapped in the katydid's mandibula and had metasoma spasms. The katydid was euthanized and preserved, and parts of the scorpion were also preserved in 80% ethanol. Both specimens were deposited in the invertebrate collection of Universidade Federal de Pernambuco - UFPE (CA-UFPE 01112), curator Dr. Debora Almeida. Images were made with the aid of a stereomicroscope ZEISS Stemi 508 equipped with a AxioCam 105 color. The observation lasted three minutes before the orthopteran was captured to avoid it escaping. As a result of the loss of important taxonomical characters such as the hemispermaphore, the scorpion could be identified only to genus level as *Chactopsis* Kraepelin, 1912, according to its somatic characteristics (Lourenço 2002; Ochoa *et al.* 2013). The orthopteran could also be identified only to genus level as *Hyperomerus* Redtenbacher, 1891 (Figure 2) by Dr. Rafael Heleodoro (Instituto Nacional de Pesquisas da Amazônia - INPA).

Hyperomerus is a Neotropical genus of katydids belonging to the Tettigoniidae family (Conocephalinae: Agraeciini). These insects are nocturnal and their predominantly brown-



Figure 1. Female nymph of *Hyperomerus* sp. preying on a *Chactopsis* sp. scorpion in a terra firme forest in Cruzeiro do Sul, Acre state, western Brazilian Amazon. This figure is in color in the electronic version.



Figure 2. Female nymph of *Hyperomerus* sp. found preying on a scorpion. A – dorsal view of body; B – lateral view of body; C – lateral view of genitalia showing the ovipositor; D – ventral view of genitalia, ovipositor in detail; E – dorsal view of genitalia, ovipositor in detail. This figure is in color in the electronic version.

black coloration matches their natural habitat in the leaf litter on the forest floor (Montealegre-Z and Morris 2003). They spend the day hidden inside rolled leaves and are rarely seen unless disturbed (Nickle and Castner 1995). Katydid nymphs belonging to *Hyperomerus* can be found at night on vegetation or foraging on the ground, feeding on debris and eggs of small invertebrates (Montealegre-z and Morris 2003). The habit of foraging on the ground probably facilitates encounters with scorpions, which are commonly found on the ground (Pintoda-Rocha *et al.* 2007). This is the first record of the predation of an unusual predator-prey interaction between *Chactopsis* sp. and *Hyperomerus* sp., and also the first observation of an antagonistic interaction between these invertebrate groups in the Neotropical region. In a recent compilation of scorpion predation events, Dupre (2020) described the predation of these arachnids by Jerusalem crickets *Stenopelmatus* Burmeister, 1838 in the USA. These unusual observations of predator-prey interactions provide important basic data for ecological studies on food network dynamics, predator-prey cycle and behavioral ecology. Predatory events involving Amazonian scorpions are poorly documented, but are potentially frequent and diversified in the species-rich tropical communities that house a large diversity of potential prey and predators.

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