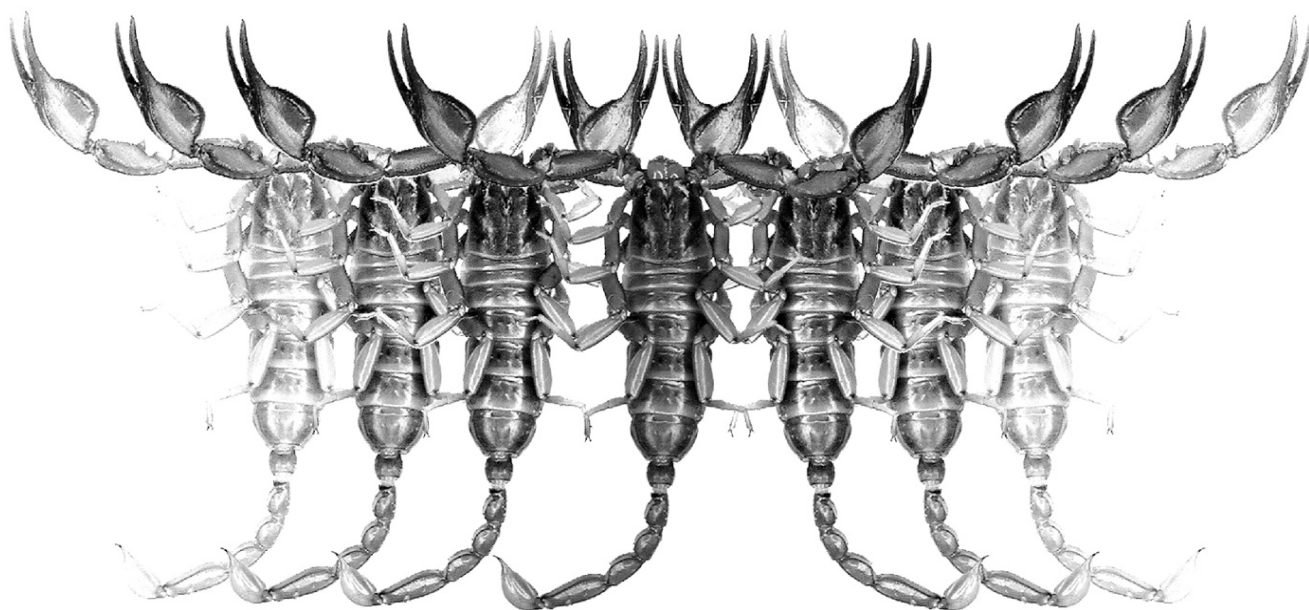


# ***Euscorpius***

**Occasional Publications in Scorpiology**



**First report of intraguild predation in  
scorpions (Scorpiones: Buthidae)  
from Turkey**

**Şahin Toprak, Rıdvan Kurt & Ersen Aydın Yağmur**

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# *Euscorpius*

## *Occasional Publications in Scorpiology*

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# First report of intraguild predation in scorpions (Scorpiones: Buthidae) from Turkey

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## Summary

Scorpions are predators of a wide range of invertebrates even including other scorpions. Larger species commonly prey on smaller species or juveniles. Here, we report three cases of intraguild predation of *Mesobuthus mesopotamicus* (Penther, 1912) and *Compsobuthus matthiesseni* (Birula, 1905) by *Hottentotta saulcyi* (Simon, 1880) (Scorpiones: Buthidae) in Şırnak Province, Turkey. These are the first cases reporting antagonistic interactions among scorpions in Turkey.

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## Introduction

Species that act as predators and coexist in the same habitat may compete for resources (e.g., prey and shelters). In many cases, an intraguild predation may occur. In this interaction, one predator kills or eats another that often use limited resources and thus potentially become competitors (Polis et al., 1989). Intraguild predation commonly occurs between generalist predators such as scorpions that usually prey on a wide range of invertebrates (Polis & McCormick, 1986). Scorpions compete for prey with other generalist arthropod predators such as other scorpion species, solpugids, spiders, and predatory insects. Many cases have been reported until of scorpions preying on each other, mostly in the Neotropics (e.g., Rodríguez-Cabrera et al., 2020; Lira et al., 2017; Silva Júnior et al., 2021). However, at best of our knowledge, no records of scorpion-on-scorpion predation exist from Turkey, a country with high faunal scorpion diversity due to its environmental and zoogeographic complexity. In this paper, we report three cases of intraguild predation involving scorpion species from Turkey.

Şırnak Province has six scorpion species: *Androctonus* cf. *turkiyensis* (see Yağmur et al., 2008c; Yağmur, 2021), *Compsobuthus matthiesseni* (Birula, 1905) (see Yağmur et al., 2008a), *Hottentotta saulcyi* (Simon, 1880) (see Yağmur et al., 2008b), *Mesobuthus mesopotamicus* (Penther, 1912) (see Kovařík et al., 2011, 2022), *Calchas kosswigi* Yağmur et al., 2013, and *Scorpio kruglovi* Birula, 1910 (an unpublished record). Among them, the species *Hottentotta saulcyi* is found in Afghanistan (Kovařík, 1997), Iran (Birula, 1918), Iraq (Simon, 1880), and Turkey (Crucitti & Vignoli, 2002). In Turkey, it is found in Batman, Hakkari, Mardin and Şırnak

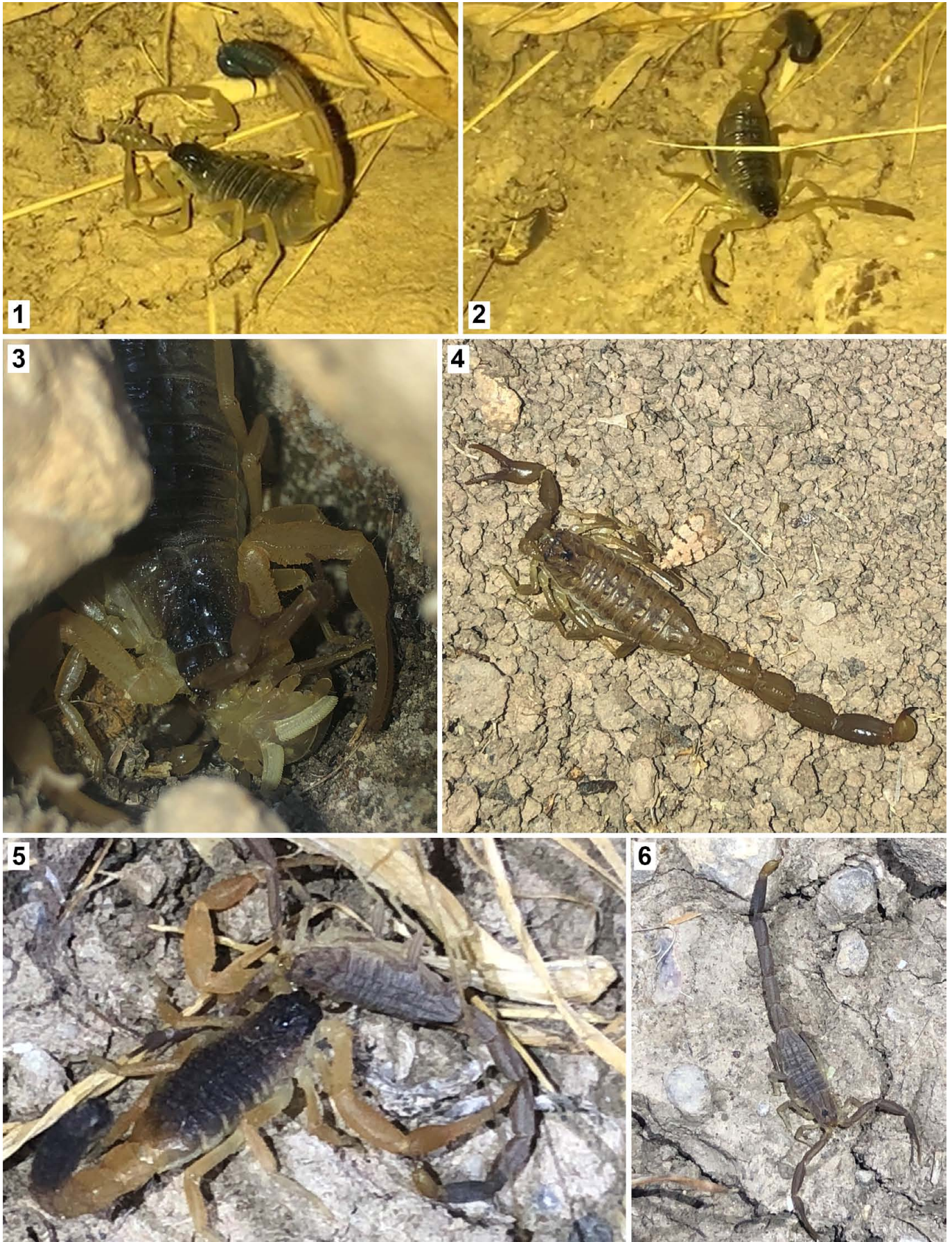
Provinces (Yağmur et al., 2008b). *Compsobuthus matthiesseni* is found in Iran (Birula, 1905), Iraq (Pringle, 1960), Turkey (Kovařík, 1996), and Syria (Kovařík, 2003). In Turkey, it is found in Adıyaman, Batman, Diyarbakır, Gaziantep Hakkâri, Hatay, Kilis, Mardin, Şanlıurfa and Şırnak Provinces (Yağmur et al., 2008). *Mesobuthus mesopotamicus* is found in Iraq, Syria, and Turkey (Kovařík et al., 2022). In Turkey, it is found in Adıyaman, Diyarbakır, Gaziantep Kahramanmaraş, Mardin, Şanlıurfa and Şırnak Provinces (Kovařík et al., 2011, 2022).

## Material and Methods

The observations were made in Kasrik (37°23'18"N 42°9'56"E, 481 m a. s. l.) and Şenoba (37°28'25"N 42°41'59"E, 907 m a. s. l.) towns of Şırnak Province during night fieldwork (22:00-23:00 h).

## Results and Discussion

The first observation was recorded in an open area in August 2020 in a close locality to Kasrik town in steppe habitat. We found an adult male *Compsobuthus matthiesseni* (CL = 31.51 mm) being preyed upon by an adult female of *Hottentotta saulcyi* (CL = 92.53 mm). During the observation, the *C. matthiesseni* has died and was beginning to be eaten on its metasoma by *H. saulcyi* (Figs. 1–2). In the same locality, in August 2021, we found an adult male *Mesobuthus mesopotamicus* (CL = 40.88 mm) preyed upon by an adult female of *H. saulcyi* (CL = 91.82 mm). Both individuals were found in a burrow with *H. saulcyi* has eaten a pedipalp of *M. mesopotamicus* (Fig. 3–4). Similarly, other records were made in August 2021 in a locality close to Şenoba town



**Figures 1–6:** **Figures 1–2.** Adult female *Hottentotta saulcyi* preying upon an adult male of *Compsobuthus matthiesseni*. **Figures 3–4.** Adult female *H. saulcyi* preying upon an adult male of *Mesobuthus mesopotamicus*. **Figures 5–6.** Subadult *H. saulcyi* preying upon an adult male of *C. matthiesseni*.

in steppe and shrub habitat. We observed an adult male of *Compsobuthus matthiesseni* (CL = 40.72 mm) being preyed upon by a subadult *Hottentotta saulcyi* (CL = 55.83 mm), which was larger than its prey. Both scorpions were found in an open area and during the observation, the *C. matthiesseni* specimen was dead but not yet eaten. Although *H. saulcyi* held its prey between metasomal segments II and III, segment V was damaged (Fig. 5–6).

Thus, our observations in Turkey show that a larger scorpion species, *H. saulcyi*, preys upon smaller species of the same family, *C. matthiesseni* and *M. mesopotamicus*. According to Polis & McCormick (1987), body size is an important factor in the interaction of scorpion species. Typically, larger-sized species act as predators of their juveniles or smaller-sized species. For example, adults of *Smeringurus mesaensis* (Stahnke, 1957) (Vaejovidae) prey on their own juveniles as well as juveniles of *Hadrurus arizonensis* Ewing 1928 (Hadruridae), and subadults of *Paruroctonus luteolus* (Gertsch & Soleglad 1966) and *Paravaejovis confusus* (Stahnke, 1940) (Polis & McCormick, 1987; listed as *Vaejovis confusus*) (Vaejovidae). In addition, we also found a subadult *H. saulcyi* preying on a similar-sized *C. matthiesseni*. Similar results were described in an experimental study conducted by Moreira et al. (2022). According to these authors, *Tityus pusillus* can prey upon *T. stigmurus* of similar body size. Previous studies show that a more aggressive scorpion species may act an intraguild predator of other scorpions (Polis & McCormick, 1987). During our fieldwork in Şenoba we found 87 *C. matthiesseni* and 41 *H. saulcyi* individuals. Five *M. mesopotamicus* and five *Scorpio kruglovi* specimens that potentially can be a prey of *H. saulcyi* were also found in this locality. Despite the higher *C. matthiesseni* abundance, our results suggest that *H. saulcyi* may be more aggressive than *C. matthiesseni*. We hypothesize that prey scorpion species outnumber the predator, and that this is part of their survival strategy. During the fieldwork in Kasrik we found 101 *H. saulcyi*, 18 *C. matthiesseni*, 5 *Scorpio kruglovi*, 41 *Androctonus* cf. *turkiyensis* and 17 *M. mesopotamicus* individuals. As opposed to Şenoba, number of *C. matthiesseni* in Kasrik was much less than of *H. saulcyi*, which could be due to predation; this hypothesis needs to be tested in a further study. There are also many other invertebrate species in this area, including other scorpions available as prey items to *H. saulcyi*, or possibly this habitat is less suitable ecologically to *C. matthiesseni*. As our study reports the first cases of intraguild predation in Turkish scorpions, these findings may help in understanding food webs in steppe habitats of Turkey.

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