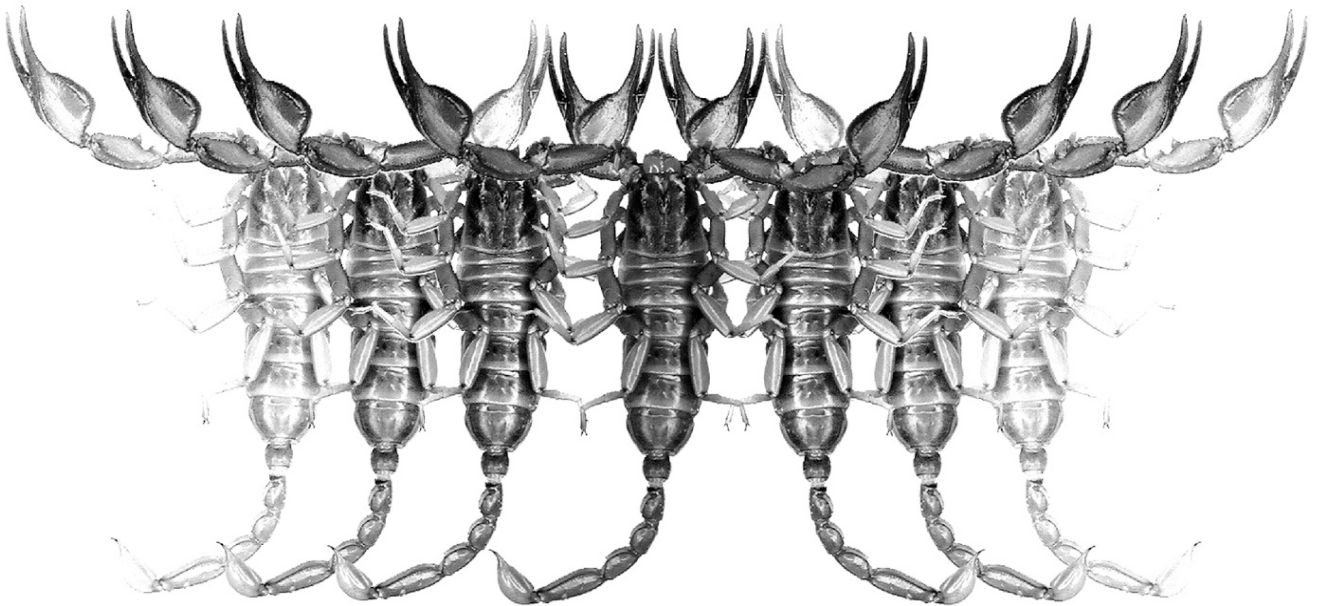


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Occasional Publications in Scorpiology



**A rare telson anomaly in
Parabuthus liosoma (Ehrenberg, 1828)
(Scorpiones: Buthidae)**

Abdulaziz R. Alqahtani & Ahmed Badry

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A rare telson anomaly in *Parabuthus liosoma* (Ehrenberg, 1828) (Scorpiones: Buthidae)

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Summary

A rare anomaly of telson vesicle with two functional aculei is observed and discussed in a *Parabuthus liosoma* (Ehrenberg, 1828) specimen collected from Jizan, Saudi Arabia.

Introduction

Morphological abnormalities of several arthropod groups have been described for various body regions. Scorpions are especially vulnerable to abnormalities related to the duplication of body segments (Teruel, 2004; Jahanifard et al., 2008). Abnormalities have been reported in many scorpion families: Bothriuridae (Teruel, 2003), Chactidae (González-Sponga, 2004), Diplocentridae (Armas, 1977), Euscorpiidae (Šarić & Tomić, 201), Hemiscorpiidae (Jahanifard et al., 2008), Iuridae (Teruel, 2003), Superstitioniidae (Graham, 2006), and Vaejovidae (Ayrey, 2011). Various abnormal structures of telson, pedipalp, and pectines have been reported in many genera of the family Buthidae, including *Androctonus*, *Alayotityus*, *Buthus*, *Centruroides*, *Hottentotta*, *Isometrus*, *Leiurus*, *Lychas*, *Mesobuthus*, *Microtityus*, *Orthochirus*, *Parabuthus*, *Rhopalurus*, *Tityus*, and *Vachoniolus* (Williams, 1971; Karataş & Kürtüllü, 2006; Jahanifard et al., 2008; de Sousa et al., 2009; Lowe, 2010; Teruel & Rein 2010; Salabi et al., 2021). The teratology of the telson was previously reported in *Hottentotta zagrosensis* Kovařík, 1997; *Leiurus quinquestriatus* (Ehrenberg, 1828); *Opisthacanthus elatus* (Gervais, 1843); and *Tityus serrulatus* Lutz & Mello, 1922 (Shulov & Amitai, 1955; Matthiessen, 1978; Galvis & Flórez-D., 2016; Salabi et al., 2021). Recently, during a comprehensive review of the personal collection of the first author, a teratology case of telson has been detected that due to its rarity deserves to be mentioned, a phenomenon not known for this species.

Material and methods

During scorpion collection from Alderb, Jizan Region in the southwestern Saudi Arabia at 17.731245°N 42.262002°E, 221 m a. s. l., 9 October 2020, by the first author, one individual of

Parabuthus liosoma (Buthidae) was observed with a rare case of abnormality in the telson. The collected scorpion was first morphologically identified according to the diagnostic characters provided by Kovařík et al. (2019) and Alqahtani & Badry (2021). The specimen was maintained in a plastic container and was provided by water and fed by crickets. Then the specimen was preserved and deposited at the Al-Azhar University Zoological Collection (AUZC), Nasr City, Cairo, Egypt. The photographs of the habitus of the specimen and the lateral view of telson were taken with a digital Canon camera (Canon EOS 6D Mark II with Canon EF 50mm f/2.5 Compact Macro Lens).

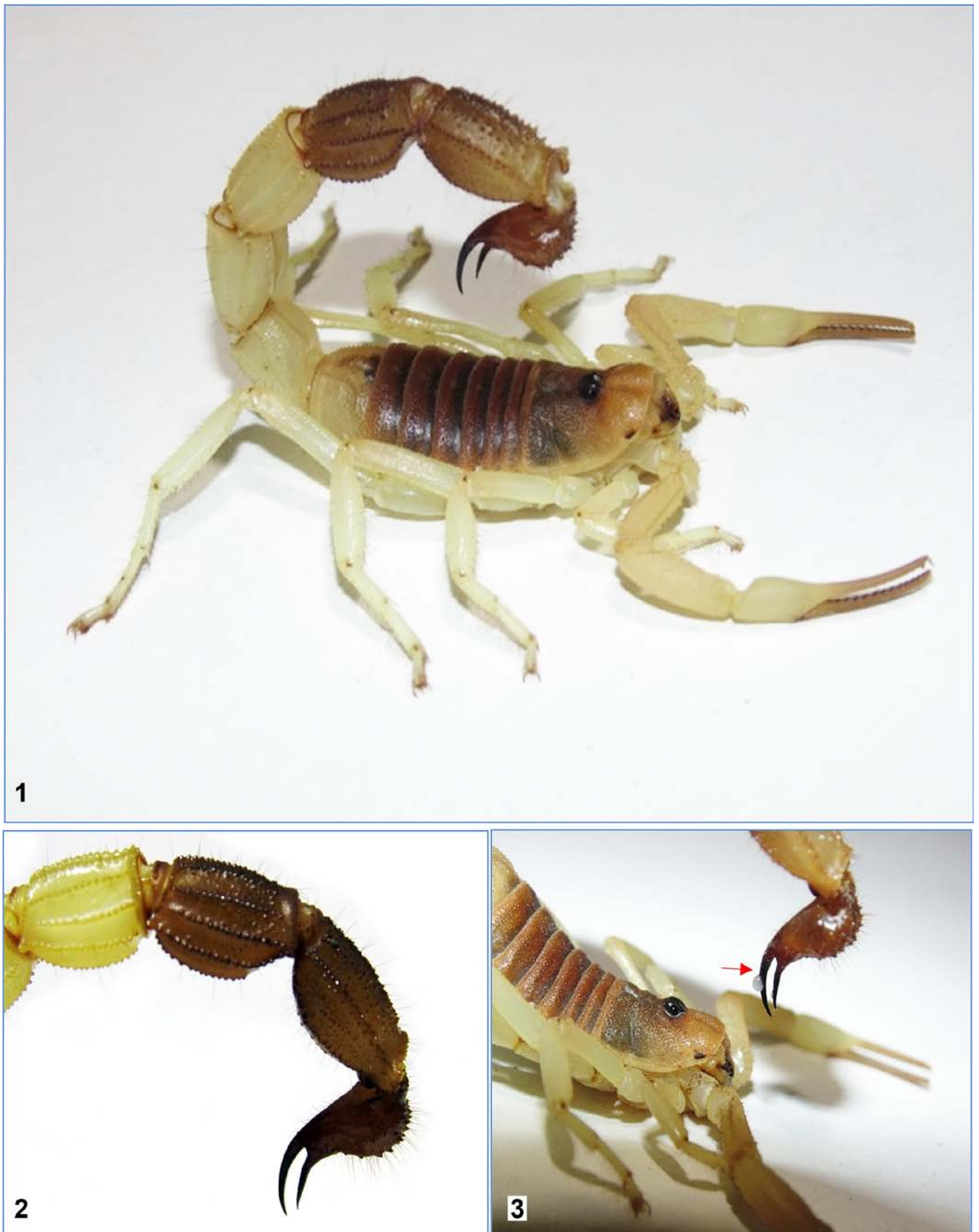
Results

In an adult female of *P. liosoma* collected from Alderb, Jizan Region in the southwestern Saudi Arabia, the prosoma, mesosoma and appendages are normal. The metasomal segments I–V and the telson are also normal in shape and structure, but the posterior of the metasoma has an anomaly of telson vesicle and aculeus (Figs. 1–2). This anomaly included the presence of two functional, different size aculei in the telson, dorsal and ventral, 6.3 and 5.1 mm long, respectively (Figs. 2–3).

The evidence of functional aculei was a milky venom droplet observed on the dorsal aculeus, and a smaller droplet on the ventral aculeus obtained by stimulating the scorpion to sting defensively as shown in Fig. 3. Also, it was observed that the scorpion used its venom apparatus to sting the prey with several successive stings after successful grasp in different positions.

Discussion

The observed teratological case in the telson of *Parabuthus liosoma* is very similar to the abnormal specimens of *Hottentotta*



Figures 1–3: *Parabuthus liosoma*, female. Figure 1. Habitus. Figures 2–3: Telson in lateral views; arrow shows dorsal aculeus.

zagrosensis, *Parabuthus heterurus* and *Opisthacanthus elatus*, illustrated in Salabi et al. (2021), Kovařík et al. (2016) and Galvis & Flórez-D (2016), respectively. However, the specimen presented here had a double aculeus that was fully functional.

Galvis & Flórez-D. (2016) refer to the malformations of structures related to the survivorship of the animal such as chelicera, chela manus, or telson as rare in comparison with others. Previous studies of scorpion abnormalities have usually focused on the morphological description of individuals collected from the natural environment, without any explanations offered (Sissom & Shelley, 1995; Mattoni et al., 2003; Teruel, 2004; Mattoni 2005; Graham, 2006; Karataş & Kürtüllü, 2006; Jahanifard et al., 2008; Seiter & Teruel, 2014). In other arthropods, anomalies and malformations occur due to temperature variations rather than bacterial infections during embryogenesis (Li & Jackson, 1996; Bouchon et al., 1998; Rigaud & Juchault, 1998; Mittmann & Wolff, 2012; Hanna & Cobb, 2006). In addition, Williams (1971) refers to the developmental anomalies that were probably associated to an abnormal midsagittal division of the posterior embryonic germ band. Duplication of body parts (mesosoma, metasoma, pectines, and aculeus) also could be interpreted as a homeotic mutation (Di et al., 2018; Kovařík et al., 2018; Sharma et al., 2014, 2015).

It is interesting to note that this scorpion succeeded in surviving in captivity and has the capacity to hunt prey using its venomous stinger and strong chela. Consequently, this specimen may have had no problem with prey capture. Rein (1993) observed that the sting use in two African *Parabuthus* species was related to the prey size and resistance. Although it is fascinating to note here that the female studied is an adult specimen with teratology in a structure related to prey capture, it is well-known that this species can kill their prey using their strong chela without applying the telson (Simard & Watt, 1990). On the other hand, the studied female shows a functional dorsal aculeus, which might have functioned well when necessary.

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