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A new case of metasomal duplication in *Centruroides guanensis* Franganillo, 1931 (Scorpiones: Buthidae)

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Abstract: A second abnormal specimen of *Centruroides guanensis* Franganillo, 1931 with two metasomas is described and illustrated in detail. It is a juvenile (apparently nymph II) which has just been captured in the south of Las Tunas province, eastern Cuba. Both specimens were born in captivity; the first one died after its first ecdisis, but the other reached adulthood and reproduced normally. This is the first published record of the occurrence of such an anomaly in this species.
Key words: Scorpiones, Buthidae, teratology, double metasoma, Cuba.

Un nuevo caso de duplicación metasomal en *Centruroides guanensis* Franganillo 1931 (Scorpiones: Buthidae)
Resumen: Se describe e ilustra en detalle un segundo ejemplar anómalo de *Centruroides guanensis* Franganillo, 1931, con dos metasomas. Se trata de un juvenil (aparentemente ninfa II) recién capturado en una localidad del sur de la provincia de Las Tunas, Cuba oriental. Ambos individuos nacieron en cautividad; el primero de ellos murió luego de su primera ecdisis, pero el segundo alcanzó la adultez y se reprodujo normalmente. Este representa el primer registro publicado de dicha anomalía en esta especie.
Palabras clave: Scorpiones, Buthidae, teratología, doble metasoma, Cuba.

Scorpions with duplicate metasoma (informally referred to as "two-tailed") undoubtedly represent a spectacular developmental anomaly in scorpions, which has always attracted attention by both scorpion researchers and enthusiasts. During the last 135 years, many cases have been described and usually also illustrated, conspicuously more than any other morphological anomaly, see Seiter & Teruel (2014) for a complete bibliographic compilation.

Five of the described cases were found in Cuba, described by Franganillo (1937), Armas (1977, 1990) and Armas *et al.* (1995a–b), and imply only two species of *Centruroides* Marx, 1890. This is most likely related to the fact that it is the most speciose, widespread and commonly found scorpion genus in both anthropized and pristine areas of the country (Teruel & Kovařík, 2012).

Four or these cases affect juveniles of *Centruroides gracilis* (Latreille, 1804), one is a shockingly aberrant second-instar with three metasomas and six telsons born in captivity from a female collected pregnant in Havana City (Armas *et al.*, 1995a–b) and three are "ordinarily two-tailed" individuals: another second-instar born within the same litter as the previous specimen (Armas *et al.*, 1995a–b), a third second-instar collected alive in Santiago de Cuba City (Franganillo, 1937), and a subadult without precise data (Armas, 1977). The fifth case is an adult male *Centruroides guanensis* Franganillo, 1931, which was collected in Cacocúm town, southwestern Holguín Province (Armas, 1990).

During an invertebrate survey conducted by the second author and some collaborators in April 9, 2016 at Las Tunitas Biological Station (Monte Cabaniguán Ecological Reserve, Jobabo Municipality, extreme southeastern Las Tunas Province), another individual of *C. guanensis* with duplicate metasoma was collected (fig. 1a–b). It was detected at night with a standard commercial UV flashlight, while normally sit-and-wait hunting on one of the wooden walls of the station house. It was preserved in 85% ethanol right after found and is now deposited in the personal collection of the first author.

This new specimen is a juvenile male, most likely a third-instar according to its size (tab. I) and pedipalp finger dentition (with mostly two supernumerary denticles, see fig. 1a–b). Its prosoma, appendages and mesosomal segments I–V are externally normal, but segment VI is symmetrically anomalous both dorsally and ventrally (fig. 2a–b): wider and with lateral margins strongly divergent distally; both plates are described in detail as follows.

● **Tergite VI** (fig. 2c) is shaped as a regular concave pentagon and its anterior half is quite normal, with the single exception of the longitudinal median keel which is doubled, parallel and irregularly fused in its median portion. From this point backwards the plate becomes abnormal: the longitudinal median keels diverge in an essentially right angle (≈ 90°) and define a rhomboid area with a median longitudinal furrow. Coloration pattern and tegumentary sculpture are normal all over the plate, but each posterior margin is narrower than ordinary.

● **Sternite VI** (fig. 2c) is shaped as a regular, mostly concave heptagon with a complete median longitudinal furrow and it is normal only for coloration pattern and tegumentary sculpture. The standard two pairs of longitudinal keels (submedians and laterals) are almost all normally developed, except for the innermost lateral keels, which are shorter due to the partial posterior division of the plate. The four spiracles are normal in size, shape and location.

From segment VII backwards, the body is completely divided into two symmetric parts: duplicated mesosomal segment VII, metasoma and telson, which are completely normal in size, proportions, coloration pattern, tegumentary sculpture, setation and carination. The single exception is minor annular deformation on median portion of left metasomal segment IV, typical evidence of a slight problem during an ecdysis.

The total length of the specimen is essentially the same by each metasoma, showing only a minor difference of left tergite VII being 0.1 mm longer than its right counterpart. Pectinal tooth count is 19/19, typical of eastern populations of *C. guanensis*.

This represents the second finding of double metasoma in *C. guanensis* and is very similar to the previous case described by Armas (1990): both specimens are males of the blackish morph and were found inside rural wooden houses in not too distant, eastern populations of the species. The two main differences of the specimen described by Armas (1990) is that it was an adult and that the division of the body started from mesosomal segment VII.

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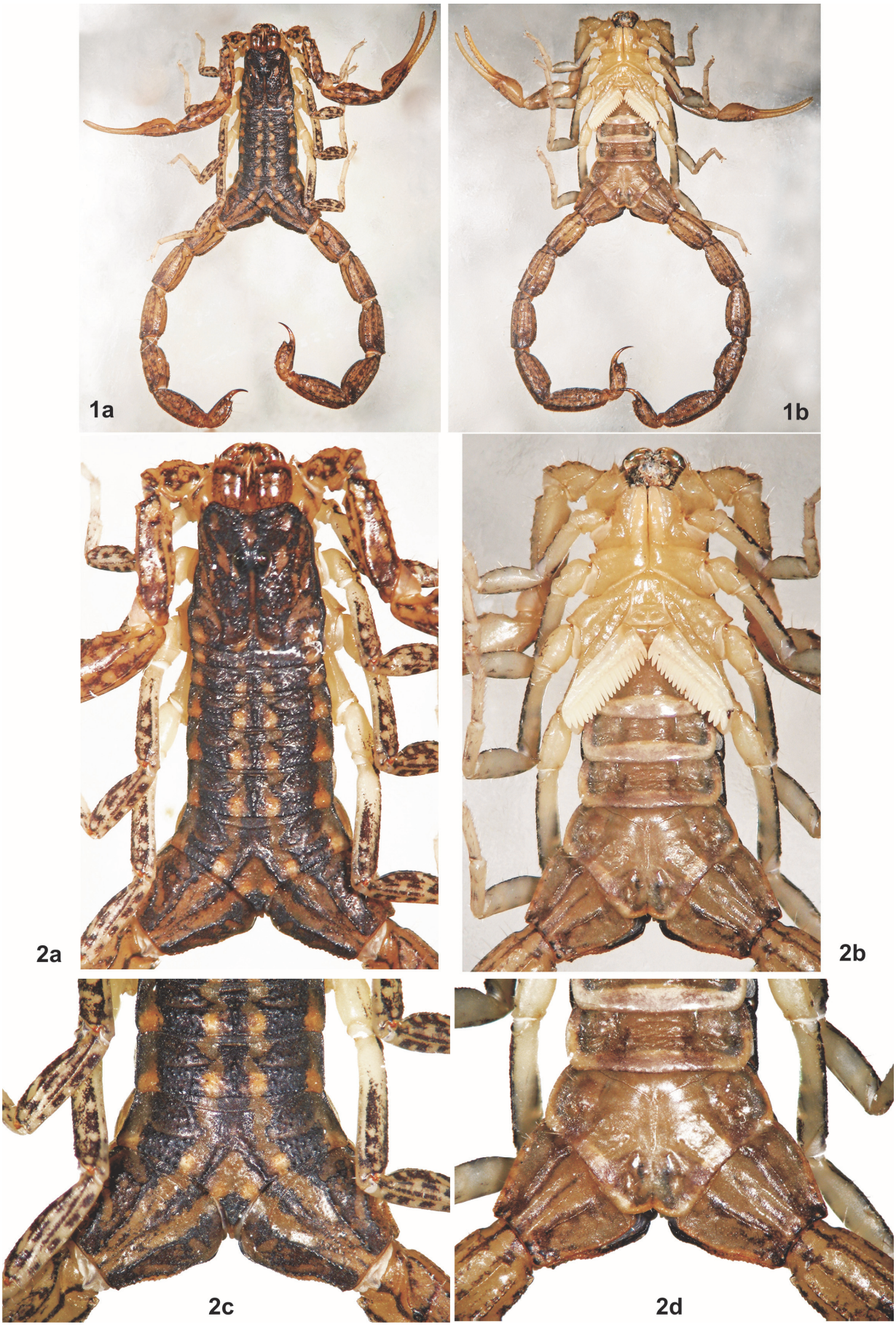


Fig. 1. Juvenile male of *Centruroides guanensis* black morph, with double metasoma: **a)** complete dorsal view; **b)** complete ventral view.
Fig. 2. Close-ups of the same specimen: **a)** prosoma and mesosoma, dorsal view; **b)** prosoma and mesosoma, ventral view; **c)** tergites V–VII, dorsal view; **d)** tergites V–VII, ventral view.

Table I. Measurements of the anomalous specimen of *Centruroides guanensis* described herein. Abbreviations: length (L), width (W, posterior in carapace), depth (H).

Dimensions (mm)		*Centruroides guanensis* ("two-tailed" juvenile ♂)	
Pedipalp	L	8.45	
Femur	L / W	2.10 / 0.64	
Patella	L / W	2.45 / 0.85	
Chela	L	3.9	
Manus	L / W / H	1.30 / 0.75 / 0.75	
Movable finger	L	2.60	
Carapace	L / W	2.45 / 2.20	
		Left	Right
Mesosoma	L	5.10	5.00
Tergite VII	L / W	1.60 / 1.85	1.50 / 1.85
Metasoma + Telson	L	12.53	12.53
Segment I	L / W / H	1.55 / 1.11 / 1.05	1.55 / 1.13 / 1.05
Segment II	L / W / H	1.90 / 1.04 / 1.05	1.90 / 1.02 / 1.04
Segment III	L / W / H	2.05 / 1.00 / 1.00	2.05 / 1.00 / 1.00
Segment IV	L / W / H	2.24 / 0.99 / 1.00	2.24 / 0.99 / 1.00
Segment V	L / W / H	2.44 / 0.99 / 0.95	2.44 / 0.91 / 0.95
Telson	L	2.35	2.35
Vesicle	L / W / H	1.35 / 0.69 / 0.71	1.35 / 0.69 / 0.71
Aculeus	L	1.00	1.00
Total	**L**	**20.08**	**19.98**

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