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Taxonomic notes on *Chactas reticulatus* Kraepelin, 1912 (Scorpiones, Chactidae), one of the scorpion species collected during the Fuhrmann's expedition to Colombia

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(With 2 figures)

Abstract

New considerations are presented regarding *Chactas reticulatus* (Chactidae), one of the scorpion species described by Kraepelin (1912, 1914), as the result of the Fuhrmann's 1911 expedition to Colombia. Based on the study of new material, the status of *Chactas reticulatus* Kraepelin is reconsidered, and this species is confirmed as valid. Two other species, *Chactas major* Kraepelin, 1912 and *Chactas ozendai* Lourenço, 1999 which also inhabit the region of La Camelia, Angelópolis in Antioquia (Colombia) are also confirmed as valid.

Introduction

In a paper on the scorpions and pedipalpi collected by O. Fuhrmann in Colombia in 1911, but especially in what is now the region of the Department of Antioquia (most of the material collected in La Camelia, next to Medellín and in Angelópolis), Kraepelin (1914) reported a total of 10 species, including three new species and a new variety (Lourenço 1999).

Field trips to the Departamento de Antioquia in Colombia, during 1997/1998, made possible the collection of several scorpion species. Among these, two were found to be new species (Lourenço 1999; Lourenço & Otero Patino 1998), while the remainders corresponded with the species described by Kraepelin (1912, 1914).

Several specimens of *Chactas reticulatus* Kraepelin, 1912 (Chactidae) were brought alive to the laboratory in Paris. During about five years, these specimens bred and reproduced in the laboratory. Their full life history cycles were reported in a recent paper (Lourenço *et al.* 2003). In the latter publication, it was mentioned that the available voucher material will be lodged in the Zoologisches Museum (Hamburg), as the original type material of this species is already deposited in that Museum.

Based on this new material, a revised diagnosis is proposed for the species *C. reticulatus*. The variation of certain characters, such as the number of pectinal teeth, is also presented.

Redescription

Chactas reticulatus Kraepelin, 1912 (Figs 1-2)

Chactas reticulatus Kraepelin, 1912: 64 (*nomen nudum*?)

Chactas reticulatus Kraepelin, 1914: 25

Chactas (Chactas) reticulatus: Mello-Leitão 1945: 62.

MATERIAL EXAMINED: The voucher material comprises of specimens collected in the area of Angelópolis, Dept. of Antioquia (Colombia) on February 1998 by W. R. Lourenço and local students. In total there are adults (6♂, 3♀), juveniles (7♂, 5♀) and 54 exuvia corresponding to instars II to V. Deposited in the Zoologisches Museum Hamburg (ZMH Acc. No. A18/03).

Notes: In the catalog of the scorpions of the world, Sissom (2000) stated as follow: "What was intended to be the original description of this species was apparently published in 1914, two years after this species was listed in the revision of Chactinae (Kraepelin, 1912). In the revision, Kraepelin cited his paper as "1912", even giving the correct pagination."

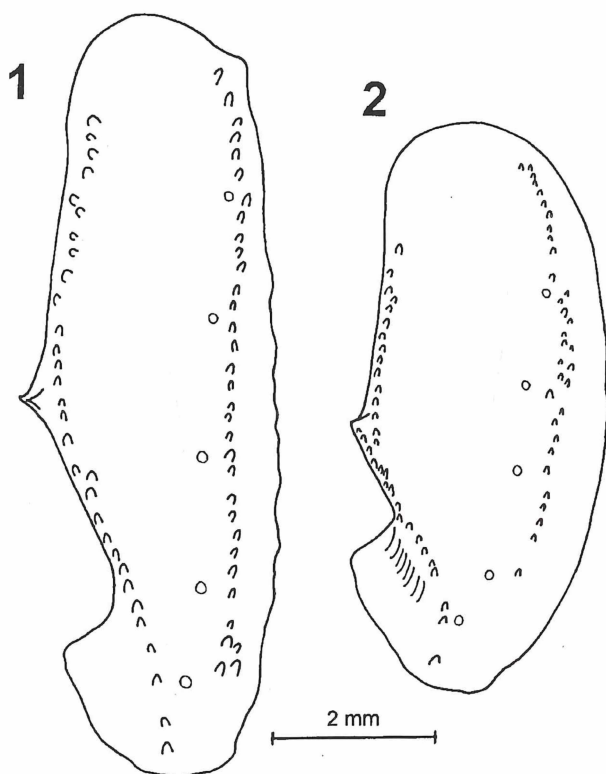
In his 1912 revision of the Chactinae Kraepelin, in fact, made reference to *C. reticulatus* in a three line note. He indicated, however, in the list of references "1912 *Chactas reticulatus* Kraepelin in: Mém. Soc. Neuchât. Sc. Nat. V, p. 25." According to the Zoological Record the article in the Mém. Soc. Neuchât. Sc. Nat. was only published in 1914. It is therefore difficult to understand how Kraepelin could have the precise reference of this paper in 1912. A possible explanation is that Kraepelin checked the proofs of the Neuchâtel article in 1912, which was already in final pagination, but for some (financial?) reason the paper took two years to be published. This only took place in 1914. In any case, it is only in the 1914 publication that a full description of *C. reticulatus* was given. In my opinion the short citation of 1912 should correspond to a *nomen nudum*, since there is no indication of type material or any real description. The correct date of description should therefore be 1914.

Description (based on ♂ and ♀; measurements in Table 1).

Coloration. Basically reddish-brown to blackish-brown with some diffuse variegated fuscous tints. Carapace reddish-brown. Tergites reddish-brown with vestigial confluent fuscous spots. Metasomal segments reddish-brown with lateral vestigial reddish spots; carinae blackish; vesicle reddish-yellow. Chelicerae yellowish, with a diffuse variegated brownish colour; fingers a uniformly dense blackish colour. Pedipalps reddish-brown; fingers and carinae densely blackish. Venter and sternites reddish; brownish spots present on coxapophysis and sternites.

Morphology. Carapace not too lustrous, rather opaque and acarinate, furrows shallow. Sternum pentagonal, wider than long. Tergites acarinate, smooth but with some thin granules laterally. Pectinal tooth count, generally,

6-6 or 7-7 for males and females (see variation). Sternites smooth and shiny; VII acarinate. Metasomal segments II to V longer than wide, smooth and shiny; segment V with dense, small granulation ventrally. All keels in segments I-IV moderate. Segment V with ventral lateral and ventral median keels moderate, granulose. Pedipalps: femur with dorsal internal, dorsal external and ventral internal carinae strong, tuberculate; dorsal and ventral faces without granulation; internal face feebly granulose. Patella smooth; dorsal internal, ventral internal, ventral external and external carinae moderate to strong; other carinae vestigial. Chela smooth; dorsal marginal, external secondary, and ventro-internal carinae vestigial; ventral median carina strong; other carinae weak. Chelicerae with the dentition typical of the family Chactidae (Vachon 1963). Trichobothriotaxy type C; neobothriotaxic (Vachon 1974); ventral face of patella with 5 trichobothria (Figs 1-2). For the structure of the hemispermaphore and spermaphore refer to SEM photomicrographs in Lourenço *et. al.* (2003).



Figs 1-2. *Chactas reticulatus* Kraepelin. Patella, ventral aspect, showing trichobothrial pattern: 1 - male; 2 - female.

The variation in pectinal tooth count in *C. reticulatus*, after examination of 34 males and 16 females (including exuvia) was the following:

Males		Females	
No. of teeth	No. of pectines	No. of teeth	No. of pectines
6	16	6	13
7	52	7	19

Note: As already observed by Lourenço *et al.* (2003), in *C. reticulatus*, offspring sex-ratio is strongly skewed in favour of males.

Table 1. Morphometric values (in mm) of *Chactas reticulatus* (Kraepelin)

	♂	♀
Total length	40.1	42.2
Carapace:		
- length	7.4	7.8
- anterior width	4.4	4.6
- posterior width	7.5	7.7
Metasomal segment I:		
- length	2.8	2.5
- width	3.2	3.0
Metasomal segment V:		
- length	6.8	6.6
- width	2.5	2.3
- depth	2.4	2.3
Vesicle:		
- width	2.6	2.3
- depth	2.2	2.2
Pedipalp:		
- femur length	9.4	6.6
- femur width	2.4	2.5
- patella length	9.3	6.7
- patella width	2.6	2.9
- chela length	16.2	13.6
- chela width	3.3	4.5
- chela depth	3.2	4.2
Movable finger:		
- length	6.8	6.6

Key to *Chactas* species known from Antioquia

The key, already proposed by Lourenço (1999) to the species of *Chactas* known to Antioquia, can now be confirmed:

1. Scorpions with a total length ranging from 60 to 70 mm; pectines with 6 from 9 teeth 2
- Scorpions with a total length ranging from 25 to 30 mm; pectines with 5 to 6 teeth; tegument smooth and shining *C. ozendai*
2. Tegument smooth and shining; pectines with 8 to 9 teeth *C. major*
- Tegument opaque; pectines with 6 to 7 teeth *C. reticulatus*

Ecological remarks

C. reticulatus inhabits dense altitudinal rainforest at elevations from 2400 to 2800 m. This forest is composed of large numbers of different families of plants, which vary according to altitudinal gradients (Gentry 1982). The vegetation is dense. In some areas, daylight scarcely reaches soil level. The scorpions were found under logs and bark, as well as in soil litter.

Population densities of several *Chactas* spp. appear to be moderate to low. *C. reticulatus* is one of the less common species in the Central Cordillera of the Department Antioquia in Colombia. The diel behaviour of *C. reticulatus*, both in the field and in the laboratory, is characteristic of a species dwelling in dense forest (see Cloudsley-Thompson 1981). The scorpions move slowly and only leave their retreats at night. Their predatory technique is of the 'sit-and-wait' type. They wait motionless with the pedipalp fingers opened. Cannibalism seems to be uncommon in areas of primary forest, and was rarely observed under laboratory conditions.

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