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## Further considerations on the species of *Compsobuthus* Vachon, 1949 from Western Africa (Scorpiones, Buthidae)

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(with 15 figures)

### Abstract

Three species of *Compsobuthus*, *C. berlandi* Vachon, 1950, *C. williamsi* Lourenço, 1999 and *C. simoni* Lourenço, 1999 are confirmed for Western Africa\*. In the present note, *C. berlandi* is redescribed based on the type material now clearly identified, and some new specimens collected in Mauritania. This species is confirmed as endemic to Mauritania. Two new specimens of *C. simoni*, a species previously known only from Niger, are also recorded from Togo and its male is described for the first time.

**Key words:** Scorpiones, Buthidae, *Compsobuthus*, Western Africa, Togo.

### Introduction

Historical aspects about the creation and composition of the genus *Compsobuthus* Vachon, 1949 have been discussed in recent papers (Lourenço 1999, 2001, 2004, Lourenço & Monod 1998, Lourenço & Vachon 2001). In other more completed contributions, attempts to clarify the precise identity of some species and also their geographic patterns of distribution have been done. Some studies, such as the revision of *Compsobuthus matthiesseni* (Birula, 1905) by Sissom & Fet (1998) proved

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\* The records of *Compsobuthus weneri* (Birula, 1908) from Western Africa are due to misidentification. This question will be a subject of oncoming paper (Lourenço, in preparation).



**Fig. 1.** *Compsobuthus berlandi* Vachon, female alive from the 'Palmeraie de Terjit', (Mauritania), now housed in the Zoologisches Museum Hamburg.

to be successful mostly due to the precise study of old types. In other cases, however, although the efforts have been undertaken (Sissom 1994, Kovařík 2003, Hendrixson 2006), the studies did not achieve to precise clarification of the identity of several old species, mainly due to the impossibility of revision of the type material.

With the present note, I am starting a series of studies on the genus *Compsobuthus* which intend to bring some further clarification to this complex group.

### Methods

Illustrations and measurements were produced with the aid of a Wild M5 stereo-microscope with a drawing tube (camera lucida) and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Vachon (1952) and Hjelle (1990).

### Taxonomic account

Family Buthidae C. L. Koch, 1837

Genus *Compsobuthus* Vachon, 1949

*Compsobuthus berlandi* Vachon, 1950  
(Figs 1-8)

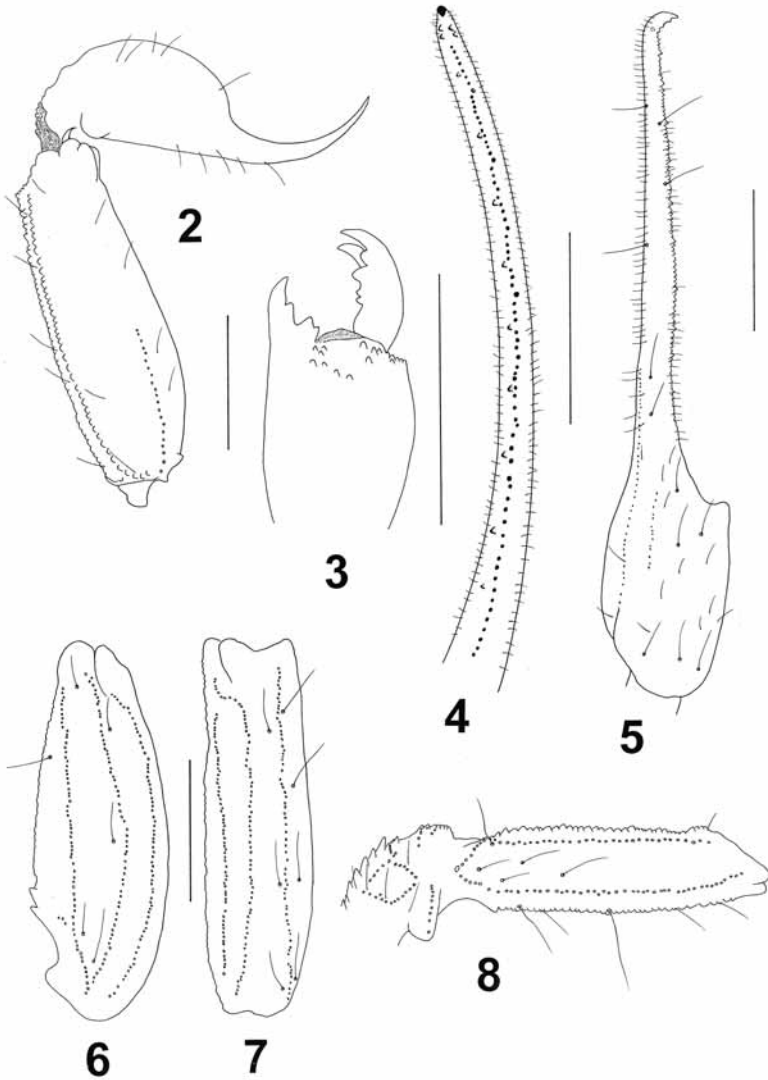
*Compsobuthus berlandi* Vachon, 1950: 456; Vachon, 1953: 1020.

Vachon (1950) described *C. berlandi* on the basis of five specimens, four of which were juveniles. Mainly because Vachon (1950) stated in his list of studied specimens "1 ♀ adulte, type", and also illustrated this specimen in both of his papers (1950, 1953), some authors presumably considered this only specimen as a type (see Fet & Lowe 2000). In fact, what Vachon (1950) stated as a 'type', has the meaning of the holotype. I was able to locate all specimens listed by Vachon (1950), and these are labelled 'cotypes'. Consequently, to clarify the situation, I designate at present this female 'type' as the lectotype and the other specimens as paralectotypes.

TYPE MATERIAL. Mauritania, Atar, March 1949 coll. A. Villiers: 1 juvenile ♂, Paralectotype (MNHN-RS-1847). Kedia d'Idjil, mountains E of Fort-Gouraud, March 1949, coll. A. Villiers: Lectotype ♀ (MNHN-RS-1845). Juvenile male and female (not 2 females): Paralectotypes (RS-6995-6996), Fort-Gouraud (400 km E of Villa-Cisneros), November 1947 (not 1948), coll. L. Berland, juvenile ♀: Paralectotype (MNHN-RS-1846).

NEW MATERIAL. Mauritania, Miferma de Choûm, 2-4 February 1968, coll. J. Garzoni, pre-adult ♀, 1 juvenile ♀ (ZMH Acc. No. A2/09). Palmeraie de Terjit (20 25 27°N - 130 88 19° W), 330 m, 30 March 2008 coll. Ph. Geniez, ♀ (ZMH Acc. No. A2/09).

REDESCRIPTION (measurements in Table 1). Coloration. Generally yellowish to pale yellow with only a few light spots over the anterior edge of carapace and metasomal segment V; eyes surrounded by black



**Figs 2-8.** *Compsobuthus berlandi* Vachon, female from the 'Palmeriaie de Terjit': **2.** metasomal segment V and telson, lateral aspect; **3.** chelicera, dorsal aspect; **4.** disposition of the granulations over the dentate margins of pedipalp-chela movable finger; **5-8.** trichobothrial pattern; **5.** chela, dorso-external aspect; **6-7.** patella, dorsal and external aspects; **8.** femur, dorsal aspect. (Scale bars = 2 mm).

Table 1. Morphometric values (in mm) of the lectotype ♀ of *Compsobuthus berlandi* Vachon and ♂ of *C. simoni* Lourenço.

|                      | <i>C. berlandi</i><br>♀ | <i>C. simoni</i><br>♂ |
|----------------------|-------------------------|-----------------------|
| Total length         | 37.0                    | 25.9                  |
| Carapace:            |                         |                       |
| - length             | 5.1                     | 3.4                   |
| - anterior width     | 3.1                     | 2.1                   |
| - posterior width    | 4.9                     | 3.6                   |
| Metasomal segment I: |                         |                       |
| - length             | 3.3                     | 2.2                   |
| - width              | 2.4                     | 1.9                   |
| Metasomal segment V: |                         |                       |
| - length             | 5.5                     | 3.9                   |
| - width              | 1.9                     | 1.5                   |
| - depth              | 1.8                     | 1.4                   |
| Vesicle:             |                         |                       |
| - width              | 1.7                     | 1.3                   |
| - depth              | 1.6                     | 1.2                   |
| Pedipalp:            |                         |                       |
| - Femur length       | 4.7                     | 3.0                   |
| - Femur width        | 1.3                     | 0.9                   |
| - Patella length     | 5.7                     | 3.7                   |
| - Patella width      | 2.1                     | 1.4                   |
| - Chela length       | 9.9                     | 6.3                   |
| - Chela width        | 1.9                     | 1.4                   |
| - Chela depth        | 1.8                     | 1.3                   |
| Movable finger:      |                         |                       |
| - length             | 7.2                     | 4.2                   |

pigment. Vesicle yellowish; aculeus yellowish at the base and reddish at the tip. Chelicerae yellowish, with dark reddish teeth. Pedipalps yellowish overall; rows of granules on the dentate margins of the fingers reddish. Legs yellowish.

**MORPHOLOGY.** *P r o s o m a.* Anterior margin of carapace weakly emarginated. Carapace carinae moderately developed; anterior median, central median, posterior median and central lateral moderately marked; posterior median carinae terminating distally in a small spinoid process that extends beyond the posterior margin of the carapace. Intercarinal spaces weakly granular; almost smooth centrally. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by one ocular diameter. Three pairs of lateral eyes. *M e s o s o m a.* Tergites I-VI tricarinate. Lateral carinae on I-VI strongly marked; each carina terminating distally with a spinoid process that extends strongly beyond the posterior margin of tergite. Median carinae on I weak; on II-VI moderate to strong, crenulate; terminating distally on each segment with a spinoid process that extends slightly beyond the posterior margin of the tergite. Tergite VII pentacarinat, with lateral pairs of carinae moderate to strong; median carinae present on proximal one-half, moderate.

Intercarinal spaces weakly granular, almost smooth. Sternites: Lateral carinae absent from sternites III-V; weak on VI; moderate, finely crenulate on VII. Submedian carinae absent from all sternites. Pectines moderately long; pectinal tooth count 14 to 17 in females, 19 to 20 in males. *M e t a s o m a*. Segments I-II with ten carinae, crenulate; III-IV with eight carinae. Segment V with five carinae; ventromedian carinae moderate to weak. Dorsal furrows of all segments weakly developed, smooth; intercarinal spaces moderately to weakly granular. Telson weakly granular. Subaculear tubercle inconspicuous or absent. *C h e l i c e r a e*. With two denticles at the base of the movable finger (Vachon 1963). *P e d i p a l p s*. Trichobothrial pattern orthobothriotaxic, type A (Vachon 1974); dorsal trichobothria of femur in  $\beta$  (Beta) configuration (Vachon 1975). Femur pentacarinata; all carinae moderately crenulate. Patella with 7-8 carinae; all carinae moderate to weak; dorso-internal carinae with one or two spinoid granules. Chela slender, with elongated fingers; all carinae weakly marked. Dentate margins on movable and fixed fingers composed of 9 almost linear rows of granules; inner accessory granules small; no outer accessory granules. *L e g s*. Ventral aspect of tarsi with two rows of setae. Tibial spurs present on leg IV, reduced; absent from III. Pedal spurs present, moderate on all legs.

Males. Adult males remain unknown.

*D i s t r i b u t i o n*. Only known from Mauritania. I was not able to locate within the collections of the Natural History Museum in Paris the specimens recorded by Vachon (1958) from the 'Tassili des Ajjer' in the South of Algeria. Consequently, the presence of *C. berlandi* in this locality requires yet confirmation.

*Compsobuthus simoni* Lourenço, 1999  
(Figs 9-14)

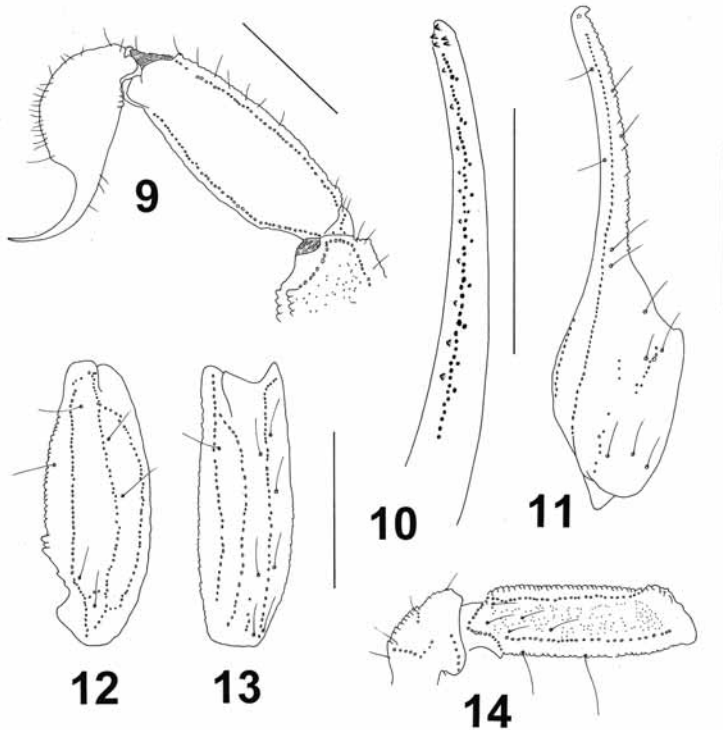
*Compsobuthus simoni* Lourenço, 1999: 91.

TYPE MATERIAL. Niger, Birni Nkonni (under stones); 9 February 1980 coll. M. Thonley: holotype ♀ (ZMH Acc. No. A87/99), paratype ♀ (ZMH Acc. No. A88/99).

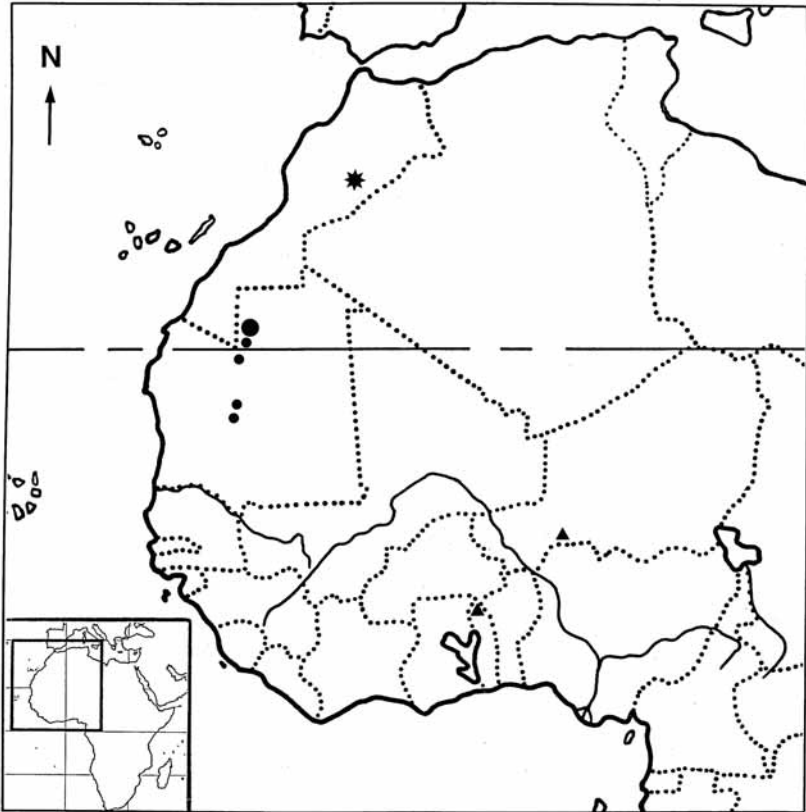
NEW MATERIAL. Togo, Mandouri, NE region of Dapango (Dapaong), natural reserve. Savannah-like formation, sand soil with lateritic rocks, 13 December 1979, coll. M. Thomas. A male deposited in the collection of the Zoologisches Museum Hamburg (ZMH Acc. No. A3/09). a female in the collection of the Muséum national d'Histoire naturelle, Paris.

*REDESCRIPTION* of the male (measurements in Table 1). *C o l o r a t i o n*. Basically yellowish with some reddish areas on the carapace carinae, tergites and metasomal segment V. Eyes surrounded by black pigment. Vesicle yellowish; aculeus yellowish at the base and reddish at the extremity. Venter yellowish. Chelicerae yellowish; fingers reddish. Pedipalps: globally yellowish; chela with some reddish areas on the articulations; rows of granules on the dentate margins of the fingers reddish. Legs yellowish.

**MORPHOLOGY.** *Proso*ma. Anterior margin of carapace weakly emarginated, almost straight. Carapace carinae moderately developed; anterior median, central median and posterior median carinae moderate; central lateral vestigial; posterior median carinae terminating distally in a small spinoid process that extends slightly beyond the posterior margin of the carapace. Intercarinal spaces somewhat moderately to weakly granular. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by a little more than one ocular diameter. Three pairs of lateral eyes. *Meso*so*ma*. Tergites I-VI tricarinate. Lateral carinae on I-VI moderate to strong, granular; each carina terminating distally with a spinoid process that extends slightly beyond the posterior margin of tergite. Median carinae on I weak; on II-VI moderate to strong, crenulate; terminating distally on each segment with a spinoid process that extends slightly beyond the posterior margin of the tergite. Tergite VII pentacarinat, with lateral pairs of carinae moderate to strong; median



**Figs. 9-14.** *Compsobuthus simoni* Lourenço, male from Togo: 9. metasomal segment V and telson, lateral aspect; 10. disposition of the granulations over the dentate margins of pedipalp-chela movable finger; 11-14. trichobothrial pattern; 11. chela, dorso-external aspect; 12-13. patella, dorsal and external aspects; 14. femur, dorsal aspect (Scale bars = 2 mm).



**Fig. 15.** Distribution of *C. berlandi* Vachon (black circle), *C. simoni* Lourenço (black triangle) and *C. williamsi* Lourenço (black star) in Western Africa. The larger black circle indicates the type locality of *C. berlandi*, Kedia d'Idjil (Kiediet ej-Jill).

carinae present on proximal one-half, moderate. Intercarinal spaces weakly granular. Sternites: Lateral carinae absent from sternites III to V; weak on sternites VI; moderate, finely crenulate on VII. Submedian carinae on sternites III-VI absent; on VII moderate. Pectines moderately long; pectinal tooth count 19-18. *M e t a s o m a*. Segments I-II with 10 carinae, crenulate; III-IV with 8 carinae. Segment V with 5 carinae; ventromedian carinae moderately marked. Dorsal furrows of all segments moderately developed, smooth; intercarinal spaces weakly granular. Telson weakly granular to smooth. Subaculear tubercle absent. *C h e l i c e r a e*. With two reduced denticles at the base of the movable finger (Vachon 1963). *P e d i p a l p s*. Trichobothrial pattern orthobothriotaxic, type A (Vachon 1974); dorsal trichobothria of femur in  $\beta$  (Beta) configuration (Vachon 1975). Femur pentacarinata; carinae moderately crenulate. Patella with 8 carinae, moderate to weak; dorsointernal carinae with 3-4



spinoid granules. Chela short with moderately elongated fingers; all carinae weakly granular to vestigial. Dentate margins on movable and fixed fingers composed of 9-9 almost linear rows of granules; external accessory granules moderately to weakly marked. Legs. Ventral aspect of tarsi with two rows of setae. Tibial spurs present on legs III and IV, moderately to strongly marked. Pedal spurs present, moderate on all legs.

*Compsobuthus williamsi* Lourenço, 1999

This species is only known from the type specimens housed in the Zoologisches Museum Hamburg.

TYPE MATERIAL. Holotype ♂, Morocco, between Erfoud and Ouarzazate (30°42' N – 50°48' W), 28 March 1972. G. Etienne leg. Deposited in the ZMH (Acc. No. A85/99). Paratype ♂, same locality data, ZMH Acc. No. A86/99.

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