



A new species of *Compsobuthus* Vachon, 1949 from Air Massif, Niger (Scorpiones: Buthidae)

Wilson R. LOURENÇO^{1,a} & Andrea ROSSI^{2,b}

¹Muséum national d'Histoire naturelle, Sorbonne Universités, Institut de Systématique, Evolution, Biodiversité (ISYEB), UMR7205-CNRS, MNHN, UPMC, EPHE, CP 53, 57 rue Cuvier, 75005 Paris, France;

²Gruppo Entomologico Toscano, c/o Museo di Storia Naturale dell'Università degli Studi di Firenze, Sezione di Zoologia "La Specola", Reparto di Entomologia, Via Romana 17, I-50125 Florence, Italy.

E-mail: ^awilson.lourenco@mnhn.fr; ^bandrea.rossi@arachnida.eu

Abstract. The *Compsobuthus* population from the Air Massif in the North of Niger, previously recorded by Vachon as *Compsobuthus weneri* (Birula, 1908), is now confirmed as a new species. The new species is described based on one pre-adult female specimen, collected several decades ago and located in the collections of the National Museum of Natural History, Paris. This specimen was apparently examined by Vachon but does not correspond to any of the specimens cited by him as *C. weneri*. The new species certainly corresponds to an endemic element of the Air Massif, as other scorpion species previously reported.

Riassunto. Una nuova specie di *Compsobuthus* Vachon, 1949 dal massiccio dell'Air, Niger (Scorpiones: Buthidae). La popolazione di *Compsobuthus* dal massiccio dell'Air nel Nord del Niger, precedentemente segnalata da Vachon come *Compsobuthus weneri* (Birula, 1908), viene ora confermata come una nuova specie. La nuova specie viene ora descritta sulla base di un esemplare femmina pre-adulto, raccolto alcuni decenni fa e localizzato nelle collezioni del Museo Nazionale di Storia Naturale di Parigi. L'esemplare venne apparentemente esaminato da Vachon ma non corrisponde ad alcuno degli esemplari citati da lui come *C. weneri*. La nuova specie molto probabilmente corrisponde ad un elemento endemico del massiccio dell'Air, come altre specie di scorpione segnalate precedentemente.

Résumé. Une nouvelle espèce de *Compsobuthus* Vachon, 1949 du Massif de l'Air, Niger (Scorpiones: Buthidae). La population de *Compsobuthus* du Massif de l'Air au Nord du Niger, précédemment citée par Vachon comme *Compsobuthus weneri* (Birula, 1908), est confirmée comme étant une nouvelle espèce. La nouvelle espèce est basée sur une femelle pré-adulte, collectée il y a plusieurs décennies et conservée dans les collections du Muséum national d'Histoire naturelle, Paris. Ce spécimen a apparemment été examiné par Vachon mais ne correspond à aucun des spécimens cités par lui comme *C. weneri*. La nouvelle espèce correspond certainement à un élément endémique comme d'autres espèces de scorpions précédemment rapportées du Massif de l'Air.

Key words. Scorpion, Buthidae, *Compsobuthus*, new species, Air Massif, Niger.

Introduction

As already outlined in several recent notes on the African populations of *Compsobuthus* (LOURENÇO, 2009a, 2009b, 2010; LOURENÇO *et al.*, 2009; ROSSI, 2016), a series of studies were started, with the aim of bringing a better clarification to several species of this complex genus of scorpions since in the past a certain number of populations were poorly studied and tentatively identified. The historical aspects about the creation and composition of this genus have already been the subject of previous discussions (LOURENÇO, 1999, 2001, 2004, 2010; LOURENÇO *et al.*, 2009).

Compsobuthus weneri (Birula, 1908), a 'key species' in the genus, was originally described from Nubia (now Sudan) and subsequently recorded from quite many countries both in Africa and Middle

East. In a recent publication dealing with several African species LOURENÇO *et al.* (2009) showed, however, that the distribution of *C. weneri* should be limited to Sudan (Nubia), Egypt and parts of Sinai Peninsula. The records of this species in Western Africa and Middle East were clearly due to misidentifications. In this same contribution, the status of two other species, *Compsobuthus klaptoczi* (Birula, 1909) from Libya and *Compsobuthus schmiedeknechti* Vachon, 1949 have been redefined. *Compsobuthus schmiedeknechti* was treated as a distinct species, with a distribution range in Lebanon, Israel and parts of Sinai Peninsula.

Concerning the other *Compsobuthus* species distributed in Western Africa, the population from Mali was first recorded by VACHON (1940) as *Compsobuthus acutecarinatus* (Simon, 1882) and subsequently as *C. weneri* (VACHON, 1950a, 1952). The re-examination of part of the material studied by VACHON (1952) led, however, to the description of a new species, *Compsobuthus tombouctou* Lourenço, 2009 (LOURENÇO, 2009b). The *Compsobuthus* population from Tassili N'Ajjer Massif in the South of Algeria was originally identified by VACHON (1958) as *Compsobuthus berlandi* Vachon, 1950. Few years ago, the study of an adult male of *Compsobuthus*, collected by P. A. Crochet and Ph. Geniez in the mountains of Tassili N'Ajjer, allowed to clarify the status of this population as a new species, *Compsobuthus tassili* Lourenço, 2010, and led to the conclusion that it was distinct from *C. berlandi* only known from Mauritania (LOURENÇO, 2010). The study originally done by VACHON (1958) about the population from Tassili N'Ajjer was based on three specimens, one adult female and two juveniles. One of these specimens with locality "station 53, rive droite de l'oued Iherir" was located within the collections of the Museum in Paris and designated as paratype of *C. tassili* in the original description (LOURENÇO, 2010).

As for the material examined by VACHON (1950b) from the Air Massif in Niger only a single specimen was yet available in the collections of the Museum in Paris, but very poorly preserved and in a state of incompleteness (VACHON, 1950b). Consequently no decision concerning its taxonomic status was taken in a previous work (LOURENÇO, 2010).

More recently another specimen, a pre-adult female collected several decades ago, was located in the collections of the Muséum national d'Histoire naturelle, Paris. According to unpublished notes this specimen was apparently examined by Vachon but not associated to any of the specimens cited by him as *C. weneri*. Precise examination of this new specimen confirmed the previous suggestion (LOURENÇO, 2010) and showed that the population from the Air Massif is also distinct from that of *C. weneri*. The new species is described here and brings further evidence for the Air Massif as an endemic centre as already demonstrated for other species (LOURENÇO, 2015).

Material and 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 HUELLE (1990).

Taxonomic treatment

Family Buthidae C.L. Koch, 1837
Genus *Compsobuthus* Vachon, 1949

***Compsobuthus air* sp. n.** (Figs 1-10)

Compsobuthus weneri (Birula, 1908): VACHON, 1950b: 96-97.

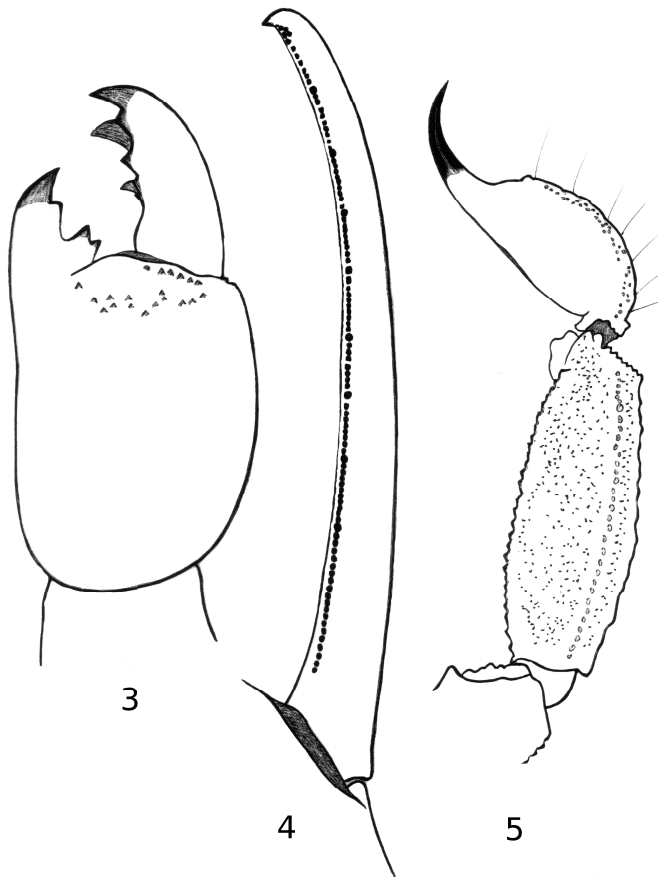
Type material. Holotype: Niger, Air Massif, Bagzane Mountains, IX/1947 (L. Chopard & A. Villiers), 1 female (probably pre-adult) deposited in the Muséum national d'Histoire naturelle, Paris, France (RS-3060).

Etymology. The specific name is placed in apposition to the generic name and refers to Air Massif, the location in which the new species was collected.

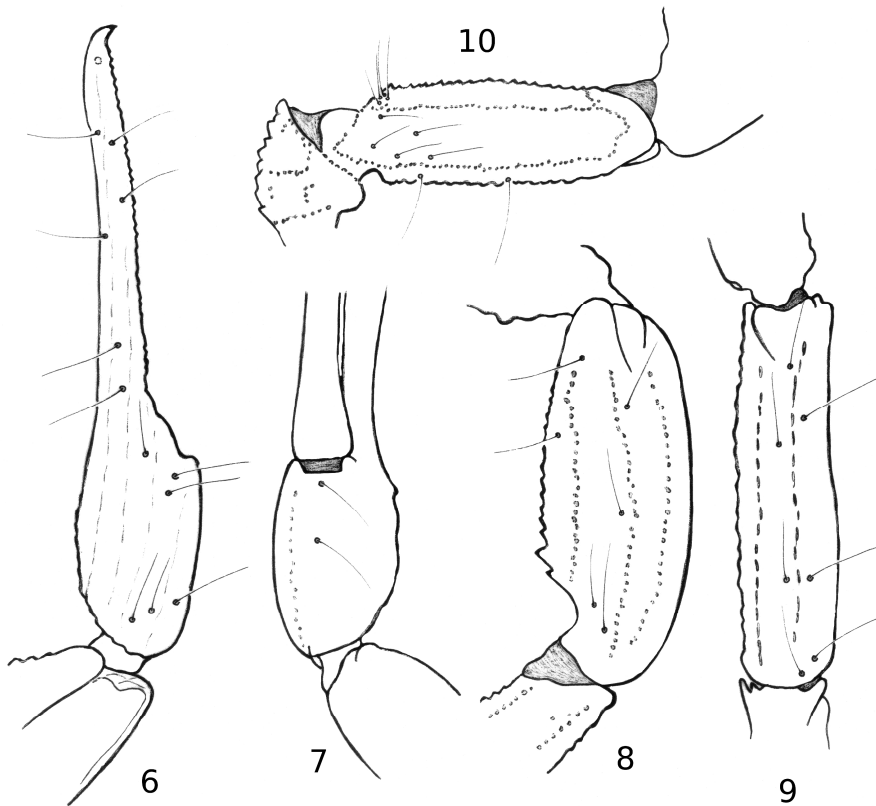
Diagnosis. Scorpion of small size; female 16.8 mm in total length. Coloration yellow to pale yellow; pedipalps and legs without infuscations. Pedipalps short; chela fingers with 8-9 rows of



Figs 1-2. *Compsobuthus air* sp. n., female holotype. Habitus, dorsal and ventral aspects.



Figs 3-5. *Compsobuthus air* sp. n., female holotype. 3. Chelicera, dorsal aspect. 4. Disposition of the granulations over the dentate margins of pedipalp-chela movable finger. 5. Metasomal segment V and telson, lateral aspect.



Figs 6-10. *Compsobuthus air* sp. n., female holotype. Trichobothrial pattern. 6-7. Chela, dorso-external and ventral aspects. 8-9. Patella, dorsal and external aspects. 10. Femur, dorsal aspect.

granules, without accessory granules present. Aculeus weakly curved and shorter than vesicle. Pectinal tooth count 13-13 in female. Trichobothrial pattern A-β; trichobothrium d_1 of femur not at the same level of d_2 .

Relationships. The *Compsobuthus* population from the Air Massif was previously identified by VACHON (1950) as *Compsobuthus weneri* (Birula, 1908). This last species, however, was confirmed to only Sudan and Egypt (LOURENÇO *et. al.*, 2009). The new species described here has indeed a strong carination on carapace and tergites as noted by VACHON (1950) and by other characters it shows some affinities with *Compsobuthus tassili* Lourenço, 2010 described from the ‘Tassili N’Ajjer’ Massif. *Compsobuthus air* sp. n. can, however, be distinguished from these two species by the following features: I) a smaller global size, 16.8 mm vs 23-40 mm; II) a general coloration evenly paler vs a darker coloration with carapace, tergites, pedipalps and legs infuscated; III) absence of accessory granules on chela fingers vs presence of accessory granules; IV) carinae of carapace and tergites strongly granulated vs carinae moderately developed; V) pectines with only 13-13 teeth vs 16-22 teeth; VI) trichobothrium d_1 of femur not at the same level of d_2 .

Description. Based on female holotype (measurements after the description).

Coloration. Generally yellow to pale yellow without infuscations on carapace, tergites, pedipalps and legs; eyes surrounded by black pigment. Vesicle yellowish; aculeus yellowish at the base and reddish

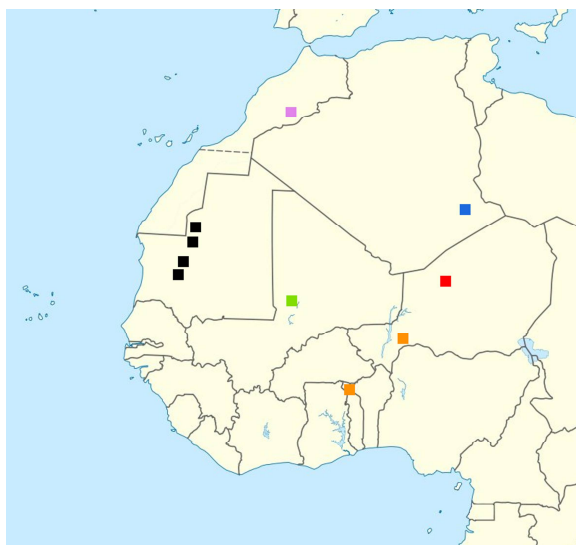


Fig. 11. Map of Western Africa showing the distribution of *Compsobuthus berlandi* (black squares), *C. simoni* (orange squares), *C. williamsi* (pink square), *C. tombouctou* (green square), *C. tassili* (blue square), *C. air* sp. n. (red square).

at the tip. Chelicerae pale yellow, with reddish teeth. Pedipalps pale yellow without infuscations; rows of granules on the dentate margins of the fingers only slightly reddish. Legs pale yellow without infuscations.

Morphology. Prosoma: anterior margin of carapace moderately emarginate. Carapace carinae moderately to strongly developed; anterior median, central median, posterior median and central lateral moderately to strongly marked; posterior median carinae terminating distally in a small spinoid process that extends beyond the posterior margin of the carapace. Intercarinal spaces moderately 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. Mesosoma: 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 moderate; 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 pentacarinate, with lateral pairs of carinae moderate to strong; median carinae present on proximal one-half, moderate to strong. Intercarinal spaces moderately granular. Sternites: lateral carinae present on sternites IV-VI; moderately crenulated; on VII strongly crenulated. Submedian carinae weak on all sternites. Pectines moderately long; pectinal tooth count 13-13 in female holotype. Metasomal segments I-III with ten carinae, crenulate; IV with eight carinae and some granules on the zone of intermediate carina. Segment V with five carinae; ventromedian carinae moderate. Dorsal furrows of all segments weakly developed, moderately granular; intercarinal spaces moderately granular. Telson moderately granular; aculeus weakly curved and shorter than vesicle; subaculear tubercle inconspicuous. Chelicerae with two denticles at the base of the movable finger (VACHON, 1963). Pedipalps: trichobothrial pattern orthobothriotaxic, type A (VACHON, 1974); dorsal trichobothria of femur in β configuration (VACHON, 1975). Femur pentacarinate; all carinae strongly crenulate. Patella with eight carinae; all carinae moderately to strongly marked; dorsointernal carinae with two spinoid granules. Chela short, with weakly elongated fingers; all carinae moderately to strongly marked; tegument moderately to strongly granular. Dentate margins on fixed and movable fingers composed of 8-9 almost linear rows of granules; accessory granules absent. Ventral aspect of leg's tarsi with two rows of setae. Tibial spurs reduced on legs III-IV; pedal spurs present, weak to moderate on all legs.

Morphometric values (in mm) of the female holotype. Total length (including telson), 16.8. Carapace: length, 2.0; anterior width, 1.2; posterior width, 2.0. Mesosoma length, 5.1. Metasomal segments: I: length, 1.2; width, 0.9; II: length, 1.4; width, 0.8; III: length, 1.6; width, 0.7; IV: length, 1.7; width, 0.7; V: length, 2.0; width, 0.6; depth, 0.6. Telson length, 1.8. Vesicle: width, 0.6; depth, 0.6. Pedipalp: femur length, 1.7, width, 0.6; patella length, 1.8, width, 0.8; chela length, 3.3, width, 0.6, depth, 0.6; movable finger length, 2.2.

Acknowledgements

We are most grateful to Elise-Anne Leguin (MNHN, Paris) for preparing the photos and the plate of the holotype.

References

- HJELLE J.T., 1990. Anatomy and morphology (pp. 9-63). In: POLIS G.A. (ed.). *The Biology of Scorpions*. Stanford University Press, Stanford, 587 pp.
- LOURENÇO W.R., 1999. Two new species of *Compsobuthus* Vachon (Scorpiones, Buthidae) from Africa. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 13 (160): 85-94.
- LOURENÇO W.R., 2001. A new species of *Compsobuthus* Vachon, 1949 from Afghanistan (Scorpiones, Buthidae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 13 (164): 315-319.
- LOURENÇO W.R., 2004. A new species of *Compsobuthus* Vachon, 1949 from India (Scorpiones, Buthidae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 14 (169): 157-163.
- LOURENÇO W.R., 2009a. Further considerations on the species of *Compsobuthus* Vachon, 1949 from Western Africa (Scorpiones, Buthidae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 15 (180): 65-74.
- LOURENÇO W.R., 2009b. A new species of *Compsobuthus* Vachon, 1949 from Mali (Scorpiones, Buthidae). *Acta Biologica Paranaense*, 38 (1-2): 1-8.
- LOURENÇO W.R., 2010. The *Compsobuthus* species from 'Tassili des Ajjer', Algeria (Scorpiones, Buthidae) and description of a new species. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 15 (182): 147-155.
- LOURENÇO W.R., 2015. A new species of *Androctonus* Ehrenberg, 1828 from the Air Massif in Niger (Scorpiones: Buthidae). *Serket*, 14 (4): 167-175.
- LOURENÇO W.R., SUN D. & ZHU M.-S., 2009. About some *Compsobuthus* Vachon, 1949 from Africa and the Middle East with the description of a new species (Scorpiones, Buthidae). *Boletín de la Sociedad Entomológica Aragonesa*, 45: 53-58.
- ROSSI A., 2016. Complementi alla fauna del Corno d' Africa: famiglia Buthidae C.L. Koch, 1837 (Scorpiones), con la descrizione di tre nuove specie. *Arachnida - Rivista Aracnologica Italiana*, 9: 2-11.
- STAHNKE H.L., 1970. Scorpion nomenclature and mensuration. *Entomological News*, 81: 297-316.
- VACHON M., 1940. Voyage en A.O.F. de L. Berland et J. Millot. Scorpions. V. *Bulletin de la Société zoologique de France*, 65: 170-184.
- VACHON M., 1950a. A propos d'un nouveau Scorpion de Mauritanie: *Compsobuthus berlandi* n. sp. *Bulletin du Muséum national d'histoire naturelle*, 2^e sér. 22 (4): 456-461.
- VACHON M., 1950b. Contribution à l'étude de l'Air (Mission L. Chopard et A. Villiers). Scorpions, Pseudoscorpions et Solifuges. *Mémoires de l'Institut français d'Afrique noire*, 10: 93-107.
- VACHON M., 1952. Études sur les scorpions. *Institut Pasteur d'Algérie*, Alger, 482 pp.
- VACHON M., 1958. Scorpions, Mission scientifique au Tassili des Ajjer (1949). *Travaux de l'Institut de recherches sahariennes de l'Université d'Alger, Zoologie pure et appliquée*, 3: 177-193.
- VACHON M., 1963. De l'utilité, en systématique, d'une nomenclature des dents des chélicères chez les Scorpions. *Bulletin du Muséum national d'histoire naturelle*, 2^e sér., 35 (2): 161-166.
- VACHON M., 1974. Étude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Muséum national d'histoire naturelle*, 3^e sér., 140 (Zool. 104): 857-958.
- VACHON M., 1975. Sur l'utilisation de la trichobothriotaxie du bras des pédipalpes des Scorpions (Arachnides) dans le classement des genres de la famille des Buthidae Simon. *Comptes Rendus de l'Académie des Sciences*, sér. D, 281: 1597-1599.

Received 10 January 2018
Accepted 20 February 2018