Bulletin de la Société entomologique de France, **126** (2), 2021 : 175-181. ISSN 0037-928X
https://doi.org/10.32475/bsef_2192 eISSN 2540-2641

The genus *Orthochirus* Karsch, 1891, in Algeria with description of a new species (Scorpiones, Buthidae)

Wilson R. Lourenço[1] & Salah Eddine Sadine[2]

[1] Muséum national d'Histoire naturelle, Sorbonne Universités, Institut de Systématique, Évolution, Biodiversité (ISYEB), UMR7205-CNRS, MNHN, UPMC, EPHE, CP 53, 57 rue Cuvier, F – 75231 Paris cedex 05, France <wilson.lourenco@mnhn.fr>

[2] Faculté des Sciences de la Nature et de la Vie et Sciences de la terre, Université de Ghardaïa, BP 455, Ghardaïa 47000, Algeria <sse.scorpion@yahoo.fr>

http://zoobank.org/EBC72C52-D7AC-4743-ACAF-13A6F23171E8

(Accepté le 20.IV.2021 ; publié le 8.VI.2021)

Abstract. – A new species of *Orthochirus* Karsch, 1891 (Scorpiones, Buthidae) is described from El-Oued, Debila, in Algeria. The number of confirmed *Orthochirus* species from Algeria is now raised to two. Further studies most certainly will clarify the status of yet undescribed populations.

Résumé. – **Le genre *Orthochirus* Karsch, 1891, en Algérie, avec la description d'une nouvelle espèce (Scorpiones, Buthidae)**. Une nouvelle espèce appartenant au genre *Orthochirus* Karsch, 1891 (Scorpiones, Buthidae) est décrite d'El-Oued, Debila, en Algérie. Le nombre d'espèces confirmées pour ce genre en Algérie s'élève désormais à deux. De nouvelles études en cours préciseront certainement le statut de populations encore non encore décrites.

Keywords. – Scorpion, North Africa, taxonomy, morphology.

In previous publications (Lourenço & Leguin, 2011a, b), the status of the African species belonging to the genus *Orthochirus* Karsch, 1891, was reconsidered and the identities of the two classical species *Orthochirus aristidis* (Simon, 1882) and *Orthochirus innesi* Simon, 1910, were clarified. This revision also conducted to the description of four new species from the Western portion of North Africa, namely from Algeria, Morocco and Mauritania. Subsequently, two other species were described from the massifs of Chad (Lourenço *et al*., 2012).

By the moment, when these studies were performed, the inventory work on the scorpions from Algeria was only beginning and consequently many if not most populations from this country were not taken in consideration; the only exception being the description of *Orthochirus tassili* Lourenço & Leguin, 2011, from the southern region of the country. In the last decade, an intensive inventory work was performed by the second author, leading to the clarification of several known species but also the descriptions of numerous new species (Sadine, 2018). In the present note, we focus on a poorly studied population of *Orthochirus*, previously identified as *Orthochirus innesi* (Sadine, 2018, 2020) based on the studies previously developted by Vachon (1952).

Since the only aim of this study is to bring new insights on the Algerian fauna of scorpions, we will not further discuss any historical aspect about the genus *Orthochirus*; these data can be found in Lourenço & Leguin (2011a). In the same way, no considerations are proposed on a number of taxonomic decisions concerning species of *Orthochirus* from the Eastern portion of North Africa. These should be detailed discussed in a future study.

Material and methods

Illustrations and measurements were obtained using a Wild M5 stereo-microscope with a drawing tube and ocular micrometre. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Vachon (1952) and Hjelle (1990). The specimens studied herein are deposited in the Muséum national d'Histoire naturelle, Paris (MNHN), and in the Université de Ghardaïa, Ghardaïa, Algeria.

Taxonomy

Family **Buthidae** C. L. Koch, 1837

Genus ***Orthochirus*** Karsch, 1891

***Orthochirus soufiensis* n. sp.** (fig. 1-9)

http://zoobank.org/1EE1A624-EECF-486F-8033-ACA492DB030F

Orthochirus innesi: Sadine, 2018: 45; Sadine, 2020: 173.

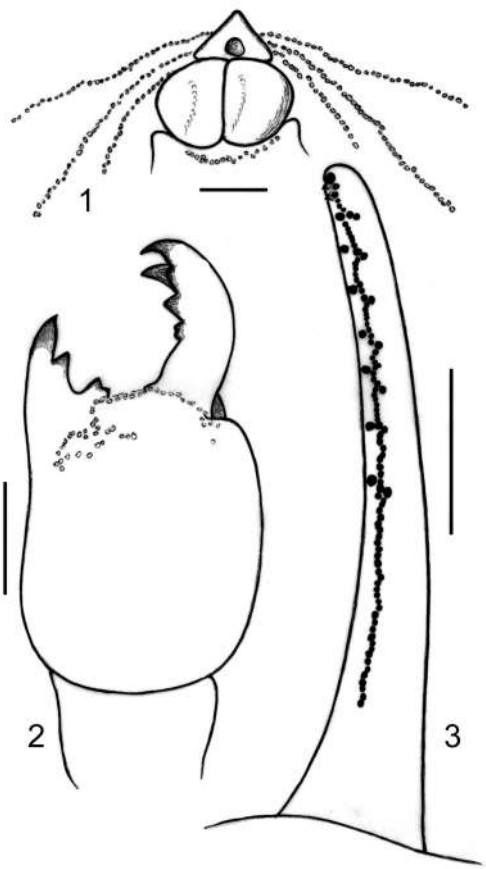

Fig. 1-3. – *Orthochirus soufiensis* n. sp., female holotype. – **1**, Sternum and genital operculum. – **2**, Chelicera, dorsal aspect. – **3**, Cutting edge of movable finger with rows of granules (scale bars = 1 mm).

Holotype: ♀, Algeria, El-Oued, Debila (6°56'E 33°29'N), 30.I.2015, *S. E. Sadine*, 60 m asl (MNHN).

Paratypes: 3 ♀, same data as for holotype; 1 ♀ and 1 ♂, same locality and collector as for holotype, III.2013 (1 ♂ and 2 ♀ in MNHN, 2 ♀ in the Université de Ghardaïa).

Diagnosis. – Scorpions of large size in relation to other African species of the genus; adult females with total lengths always superior to 30 mm; one paratype even reaching 36.3 mm. General coloration reddish-yellow to reddish-brown. Anterior margin of carapace slightly convex in females. Metasomal segments moderately enlarged posteriorly. Ventral aspect of metasomal segment V with very thin but scarce granulations posteriorly. General granulation intensely marked. Dorsal furrows of metasomal segments strongly granulated. Fixed and movable fingers of pedipalps with 8-8 (7-8) rows of denticles; accessory denticles present. Pectines with 15 to 17 teeth in females and 18-18 for male. Trichobothriotaxy*:* A-β (beta) minor-neobothriotaxy in both sexes; absence of d_2 or i_1.

Description of female holotype and paratypes. – *Measurements* in table I.

Coloration. Basically reddish-yellow to reddish-brown. Prosoma: carapace brownish; anterior and posterior margins slightly yellowish; median and lateral eyes surrounded by black pigment. Meso-

Table I. – Morphometric values (in mm) of the *Orthochirus* species treated in this study.

		O. innesi ♀ topotype	*O. soufiensis* n. sp. ♀ holotype / ♂ paratype
Total length (including telson)		32.0	35.1 / 23.6
Carapace	Length	3.8	4.2 / 3.0
	Anterior width	2.5	3.0 / 2.0
	Posterior width	4.8	5.3 / 3.3
	Mesosoma length	8.8	9.3 / 5.1
Metasomal segment I	Length	2.1	2.4 / 1.7
	Width	3.2	3.4 / 2.2
Metasomal segment II	Length	2.8	3.0 / 2.1
	Width	3.3	3.4 / 2.2
Metasomal segment III	Length	3.1	3.3 / 2.3
	Width	3.5	3.4 / 2.3
Metasomal segment IV	Length	3.8	4.0 / 2.8
	Width	3.6	3.6 / 2.3
Metasomal segment V	Length	4.0	4.8 / 3.5
	Width	3.5	3.7 / 2.4
	Depth	2.5	2.6 / 1.7
Telson	Length	3.6	4.1 / 3.1
	Width	1.4	1.7 / 1.1
	Depth	1.2	1.4 / 1.0
Femur	Length	2.7	3.3 / 2.3
	Width	0.8	1.1 / 0.8
Patella	Length	3.3	4.0 / 2.9
	Width	1.3	1.5 / 0.9
Chela	Length	4.7	5.6 / 3.9
	Width	0.9	1.2 / 0.7
	Depth	1.0	1.3 / 0.8
Movable finger	Length	3.3	4.0 / 2.8

soma: brownish-yellow; carinae and granulations darker. Metasomal segments reddish-brown; telson reddish-brown with a paler lateral strip; aculeus reddish with a darker tip. Metasomal carinae dark brown. Venter yellow to reddish-yellow; genital operculum and pectines pale yellow. Chelicerae yellow, with reddish variegated spots; fingers brownish. Pedipalps, femur and patella brownish-yellow; chela yellow. Legs yellow with diffused dark brown spots.

Morphology. Carapace intensely granular; anterior slightly convex in female. Carinae and furrows moderate. Median ocular tubercle slightly anterior to the centre of the carapace; median eyes separated by almost two ocular diameters. Three pairs of lateral eyes. Sternum subtriangular to subpentagonal, wider than long. Mesosoma: tergites with intensely marked granulations; median carina moderate in all tergites. Tergite VII pentacarinate with strongly marked carinae. Venter: genital operculum not elongated, divided longitudinally into two suboval plates. Pectines: pectinal tooth count 17-17 in female holotype; 15 to 17 in female paratypes; male paratype with 18-18; basal middle lamellae of each pecten not dilated. Sternites with thin granulations and small slit-like spiracles; VII with four moderate carinae. Metasomal segments rounded, with carinae moderately to strongly marked; granulations moderately to strongly marked; segments I and II with ten carinae; segment III with eight carinae; segments IV and V with punctuations; ventral aspect of segment V with thin and scarce granulations in the distal region. Dorsal furrows with intense granulations, moderately to strongly marked. Telson smooth with several punctuations; aculeus slightly shorter than the vesicle and moderately curved; subaculear tooth absent. Cheliceral dentition

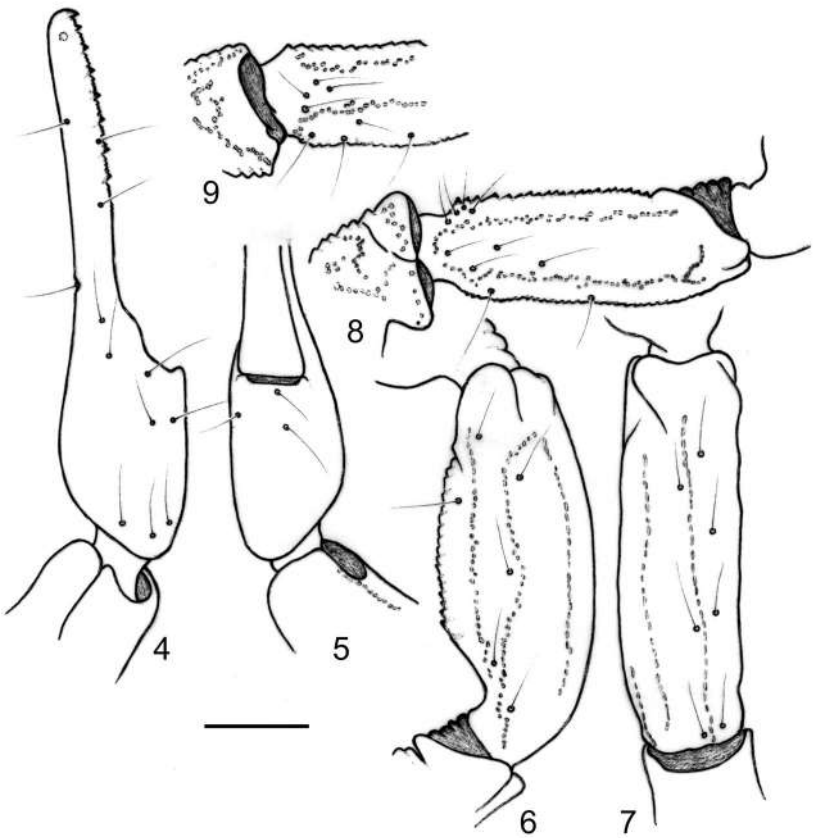

Fig. 4-9. – *Orthochirus soufiensis* n. sp., female holotype, trichobothrial pattern. – **4-5**, Chela: **4**, dorso-external aspect; **5**, ventral aspect. – **6-7**, Patella: **6**, dorsal aspect; **7**, external aspect. – **8-9**, Femur: **8**, dorsal aspect; **9**, internal aspect. Scale bar = 1 mm.

characteristic of the family Buthidae (Vachon, 1963); movable finger with basal teeth reduced and almost fused; ventral aspect of both finger and manus with thin setae. Pedipalps: femur with five strong carinae, granular; patella with 6-7 moderately marked carinae; chela without carinae, smooth. Fixed and movable fingers with 8-8 (7-8) rows of granules. Trichobothriotaxy: A-β (beta); minor-neobothriotaxy with absence of d_2 in both sexes (Vachon, 1974, 1975); bothria of small size. Legs: tarsus with two rows of setae ventrally. Tibial and pedal spurs moderately to strongly marked.

Etymology. – Specific name refers to the Arabic name 'Souf' of the region of El-Oued, where the new species was found.

Relationships. – *Orthochirus soufiensis* n. sp. can be distinguished from the other species of *Orthochirus*, and in particular from *Orthochirus innesi*, species often cited by Vachon (1952) from Algeria, by a number of characters: (i) a paler coloration pattern; body more to brownish, pedipalps and legs yellow, (ii) a bigger overall size (see Table I), (iii) anterior margin of carapace slightly convex in female, (iv) ventral aspect of metasomal segment V with very thin but scarce granulations posteriorly, (v) dorsal furrows of metasomal segments strongly granulated; in *O. innesi* the furrows are smooth, (vi) carapace, tergites and metasomal tegument more intensely granular, (vii) metasomal segments moderately enlarged posteriorly, (viii) femur trichobothrium e_1 in the new species located in a proximal position and at the same level of d_4, (ix) size of bothria in *O. innesi* is much bigger (fig. 10-14).

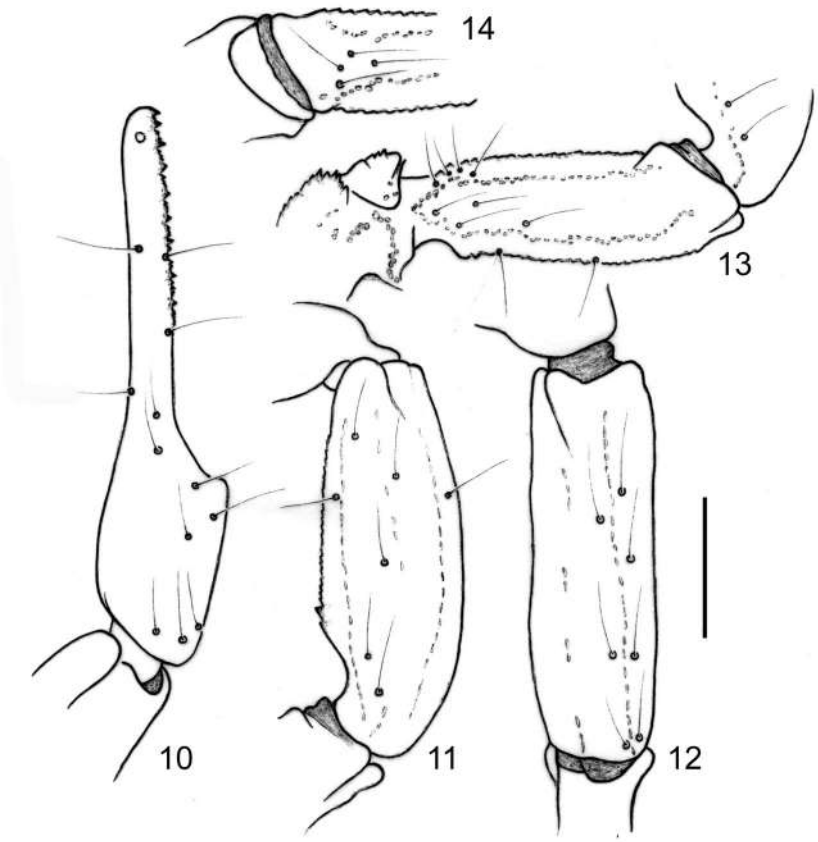

Fig. 10-14. – *Orthochirus innesi* Simon, female from W of Alexandria, trichobothrial pattern. – **10**, Chela, dorso-external aspect. – **11-12**, Patella: **11**, dorsal aspect; **12**, external aspect. – **13-14**, Femur: **13**, dorsal aspect; **14**, internal aspect. Scale bar = 1 mm.

References

Hjelle J. T., 1990. – Anatomy and morphology (p. 9-63). *In* : Polis G. A. (ed.), *The Biology of Scorpions*. Stanford : Stanford University Press, 587 p.

Lourenço W. R., Duhem B. & Cloudsley-Thompson J. L., 2012. – Scorpions from Ennedi, Kapka and Tibesti the mountains of Chad, with descriptions of nine new species (Scorpiones: Buthidae, Scorpionidae). *Arthropoda Selecta,* **21** (4) : 307-338. https://doi.org/10.15298/arthsel.21.4.03

Lourenço W. R. & Leguin É.-A., 2011a. – Further considerations on the species of the genus *Orthochirus* Karsch, 1891 from Africa, with description of three new species (Scorpiones: Buthidae). *Euscorpius,* **123** : 1-19. https://doi.org/10.18590/euscorpius.2011.vol2011.iss123.1

Lourenço W. R. & Leguin É.-A., 2011b. – One more new species of the genus *Orthochirus* Karsch, 1891 from Africa (Scorpiones: Buthidae). *Euscorpius,* **135** : 1-6. https://doi.org/10.18590/euscorpius.2011.vol2011.iss135.1

Sadine S. E., 2018. – *La faune scorpionique du Sahara septentrional algérien : Diversité et Écologie*. Thèse de Doctorat ès sciences. Université Kasdi Merbah-Ouargla. Algérie. 112 p.

Sadine S. E., 2020. – New locality of *Orthochirus innesi* Simon, 1910 in Algeria (Scorpiones: Buthidae). *Serket,* **17** (3) : 171-175.

Stahnke H. L., 1970. – Scorpion nomenclature and mensuration. *Entomological News,* **81** : 297-316.

Vachon M., 1952. – *Études sur les scorpions.* Alger : Publications de l'Institut Pasteur d'Algérie, 482 p.

Fig. 15-16. – *Orthochirus soufiensis* n. sp. – **15**, Natural habitat. – **16**, A group of females (paratypes), in their natural habitat.

Fig. 17. – Map of Algeria, showing the type localities of *Orthochirus tassili* Lourenço & Leguin (black square), *O. soufiensis* n. sp. (red star) and two possible distinct populations; one in the region of Ghardaïa (red interrogation mark) and the second in the Hoggar region which may correspond to *O. seurati* Pallary, previously considered as a synonym of *O. innesi* (black interrogation mark). A precise distribution of *O. innesi* is proposed by Lourenço & Leguin (2011a).

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) **35** (2) : 161-166.

Vachon M., 1974. – Etude 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) **140** (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 des séances de l'Académie des Sciences, Paris,* (D) **281** : 1597-1599.