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# A new species of *Buthiscus* Birula, 1905 (Scorpiones: Buthidae) from the Adrar des Ifoghas, Mali

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taxonomy;  
morphology;  
new species;  
description;  
mountain;  
Adrar des Ifoghas;  
Kidal; Mali.

**Abstract.** – A new species of scorpion belonging to the genus *Buthiscus* Birula, 1905 (Buthidae) is described from the Southwestern part of the Adrar des Ifoghas, in the region of Kidal, Mali. The new species, *Buthiscus ifoghas* n. sp. is the second element belonging to the genus *Buthiscus* and seems to inhabit mountainous environments, contrarily to the other species of the genus, *Buthiscus bicalcaratus* Birula, 1905 which is a typical species of low altitude desert areas.

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## Introduction

As already outlined in previous publications, the genus *Buthiscus* was created by Birula (1905), having as type species, by original designation, *Buthiscus bicalcaratus* Birula, 1905 which was described based on two male and two female specimens collected in the Sahara deserts of the South of Tunisia (Vachon, 1942, 1955; Lourenço, 2002; Aboshaala *et al.*, 2020, 2022).

In subsequent publications, the species *B. bicalcaratus* was redescribed, but in most cases merely cited by a number of authors (Birula, 1910, 1917; Vachon, 1942, 1948, 1952, 1955; Foley, 1945a,b; Stahnke, 1972; Pérez, 1974; El Hennawy, 1992). In other cases, it was cited in relation to synonymies with other species such as *Buthacus ducrosi* Pallary, 1937 (Pallary, 1937; Sergent, 1941; Pérez, 1974) or *Trichobuthus grubleri* Vachon, 1941 (Vachon, 1941, 1942) corrected to *Trichobuthus guebleri* by Fet (1997).

The distribution of *B. bicalcaratus*, originally established for the deserts of South Tunisia and Central Algeria, was first extended by Vachon (1955) to the region of the Tripolitania in Libya. This distribution was again slightly enlarged to the South of Libya, region of Ghadames, by Lourenço (2002). More recently, in a publication concerning Malian scorpions, Goyffon *et al.* (2012) cited the presence of *B. bicalcaratus* in Mali, reporting this species from the districts of Kidal and Tessalit, in the Northeast portion of the country (Kidal region). The authors presented a photo of a

possible female specimen, but no indication was done about the studied material or the possible collection of deposition. In their recent contribution, Aboshaala *et al.* (2022) provided more precise details about the morphology of *B. bicalcaratus* and accepted the distribution of the species as ranging from Libya to Mali, neglecting however the great gap which prevails in the Southern and Southwestern regions of Algeria.

We recently found in the old collections of the Muséum national d'Histoire naturelle, Paris, one specimen of *Buthiscus*, collected by the late Prof. J. Millot in the region of Kidal, Afrique-Occidentale Française, now Mali. The study of this specimen leads to the description of a second species for this monotypic genus.

## Material and methods

Illustrations and measurements were made using a Wild M5 stereo-microscope with a drawing tube (camera lucida) and an ocular micrometre. Maps were made using Google Maps ([www.google.com/maps](http://www.google.com/maps)), [www.maps-for-free.com](http://www.maps-for-free.com) and Adobe Photoshop software ([www.adobe.com](http://www.adobe.com)). Presented photographs are not modified except for cropping and addition of white background, scale bars and numbers in habitus illustrations. Measurements follow Stahnke (1971) and are given in mm. Trichobothrial notations follow Vachon (1974, 1975) and morphological terminology mostly follows Hjelle (1990). Statistical analyses were made using XLSTAT software.

Specimens studied herein are deposited in the MNHN (Muséum national d'Histoire naturelle, Paris, France).

**Reviewer:** Gérard Dupré (France).



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## Taxonomic treatment

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

Genus ***Buthiscus*** Birula, 1905

**Composition of the genus *Buthiscus* (in order of description)**

*Buthiscus bicalcaratus* Birula, 1905 (Algeria, Libya, Tunisia).

*Buthiscus ifoghas* n. sp. (Mali).

***Buthiscus bicalcaratus*** Birula, 1905

(Fig. 1-2, 5-9, 15, Tab. I)

*Buthiscus bicalcaratus* Birula, 1905

Birula, 1905 (623-624), 1910 (154, 156), 1917 (214, 224);

Vachon, 1942 (419-421);

Foley, 1945a (64-66), 1945b (6-7);

Vachon, 1948 (176-188), 1952 (89-95), 1955 (101-105);

Stahnke, 1972 (122);

Pérez, 1974 (20);

El-Hennawy, 1992 (97, 115);

Kovařík, 1998 (105);

Fet et al., 2000 (89);

Lourenço, 2002 (11-16);

Aboshaala et al., 2020 (181-183), 2022 (263-273).

*Buthacus ducrosi* Pallary, 1937

Pallary, 1937 (97-98);

Sergent, 1941 (355); Pérez, 1974 (19);

Fet et al., 2000 (89).

*Trichobuthus grubleri* Vachon, 1941

Vachon, 1941 (339-350);

Fet, 1997 (246);

Fet et al., 2000 (89).

**Proposition of a lectotype for *Trichobuthus grubleri* Vachon, 1941 (corrected to *Trichobuthus guebleri*), a synonym of *Buthiscus bicalcaratus*.**

The genus *Trichobuthus* and the species *T. grubleri* were described by Vachon (1941), based on a large series of specimens collected in Beni-Abbès (Central Western Algeria). The series was composed of 13 specimens: three adult males, nine immature males one immature female. According to Vachon (1941)

the material was shared between the Museum of the Institut Scientifique Chérifien (ISC; males n° 331, 333, 334, 337, 341 and 342) and the Muséum national d'Histoire naturelle, Paris (males n° 330, 332, 335, 336, 343 and 344 and female n° 345). The circumstances under which the material was shared remains unclear, however, the majority of this type-series appears to be lost or mislead. We were able to locate in the MNHN collection the adult male n° 333 (apparently not sent to the ISC). This male was equally the specimen illustrated on figure 100 of Vachon (1952). In the Catalog of the Scorpions of the World, Fet et al. (2000) indicate the existence of a holotype for *Trichobuthus guebleri*, however, this statement remains ambiguous since a holotype was never designated by Vachon (1941). For the stability of the taxonomic position of this species, we designate at present the male n° 333 as a lectotype for *Trichobuthus guebleri*.

***Buthiscus ifoghas* n. sp.**

(Fig. 3-4, 10-14, 16, Tab. I)

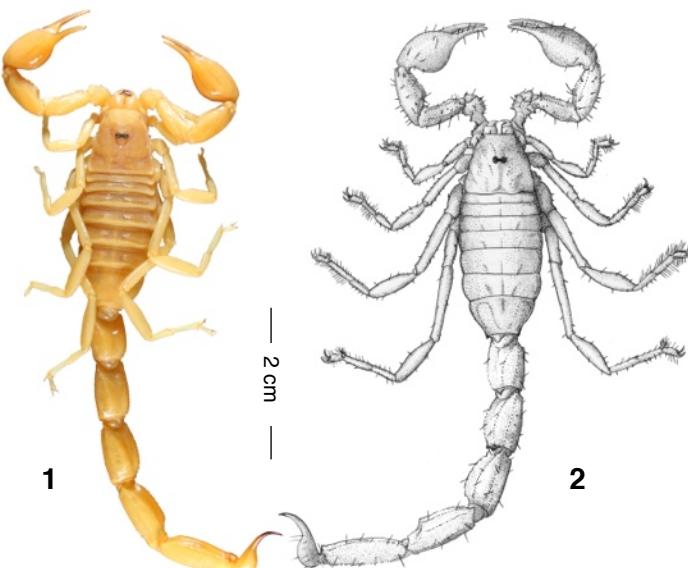
ZooBank: <http://zoobank.org/DBEA7779-B712-4E21-B852-D40EB5B8BE01>

*Buthiscus bicalcaratus* Goyffon et al., 2012: 363-364; Aboshaala et al., 2020 (181-183), 2022 (264).

**Holotype**, ♂, Afrique-Occidentale Française (now Mali), Adrar des Iforas (Ifoghas), North Kidal, around Aguel'hoc (Aguelhok), *J. Millot coll.*, 1937 (MNHN).

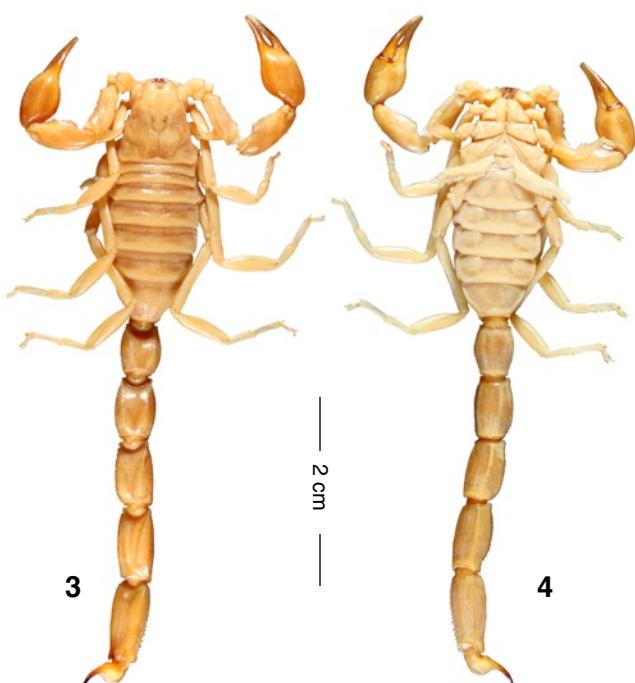
**Distribution**. – Only known from the type locality but the species might be distributed in mountain zones between Kidal and Tessalit (Goyffon et al., 2012) or even more broadly within the Adrar des Ifoghas.

**Diagnosis**. – Scorpion of moderate size in relation to specimens of the species *Buthiscus bicalcaratus*, with a total length of 66.3 mm for male. General coloration yellowish orange with aculeus and chela fingers darkened. Anterior margin of carapace moderately convex. Pedipalps with 8-9 rows of granules almost fused on the fixed and movable fingers; external and internal accessory granules weakly marked. Latero-ventral carinae on metasomal segments V conspicuous with some well-marked spiniform granules and some



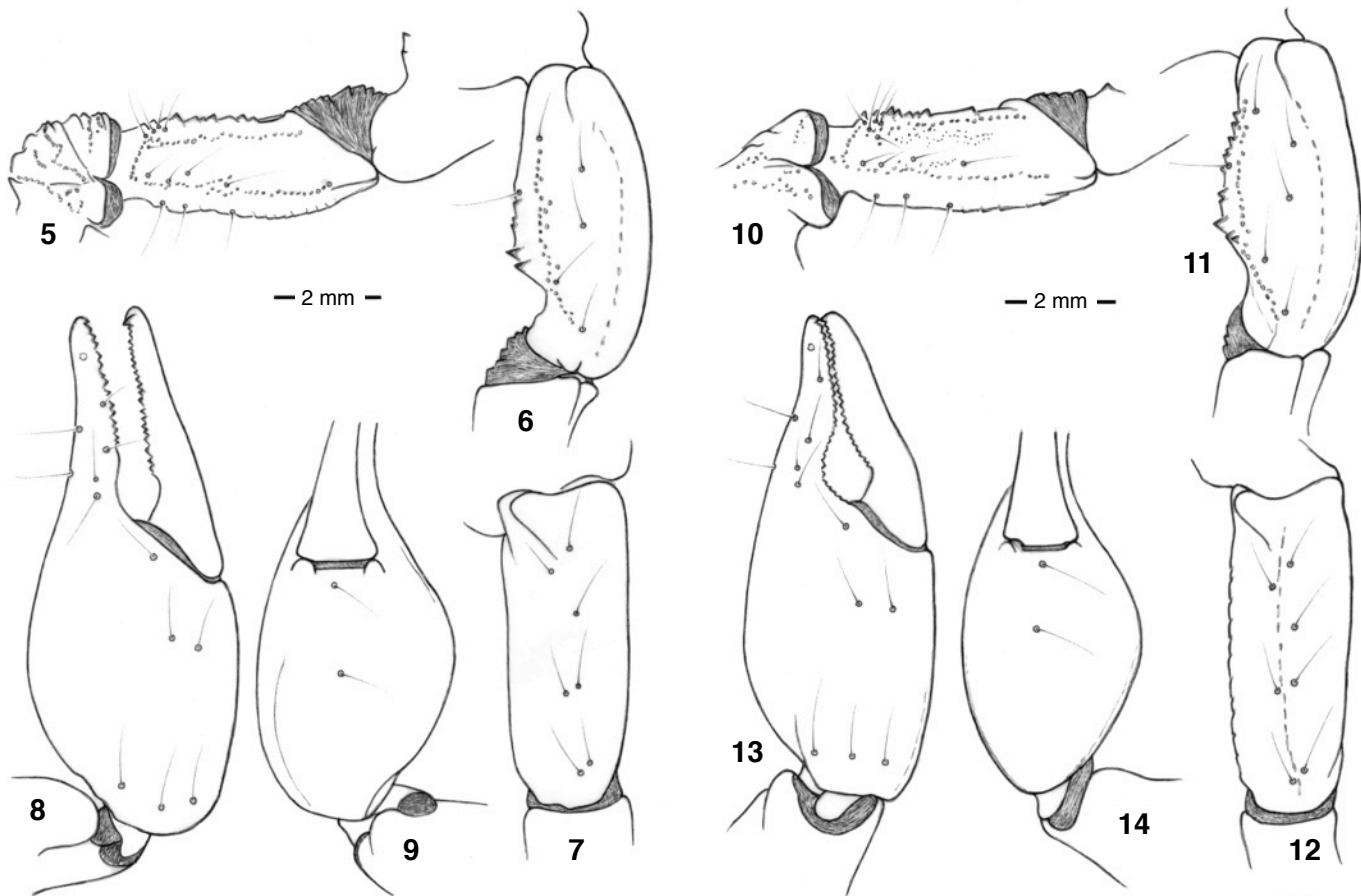
**Fig. 1-2.** *Buthiscus bicalcaratus*, habitus.

1. ♂, Souf, Northeastern Algeria. 2. ♂, Béni Abbès, Central Western Algeria, lectotype of *Trichobuthus guebleri* (from Vachon, 1952).



**Fig. 3-4.** *Buthiscus ifoghas* n. sp., ♂ holotype, habitus.

3. Dorsal. 4. Ventral.



**Fig. 5-9.** *Buthiscus bicalcaratus*, ♂ from Souf, Northeastern Algeria, trichobtrial pattern. 5. Femur, dorsal. 6-7. Patella. 6. Dorsal. 7. External. 8-9. Chela. 8. Dorsal. 9. Ventral.

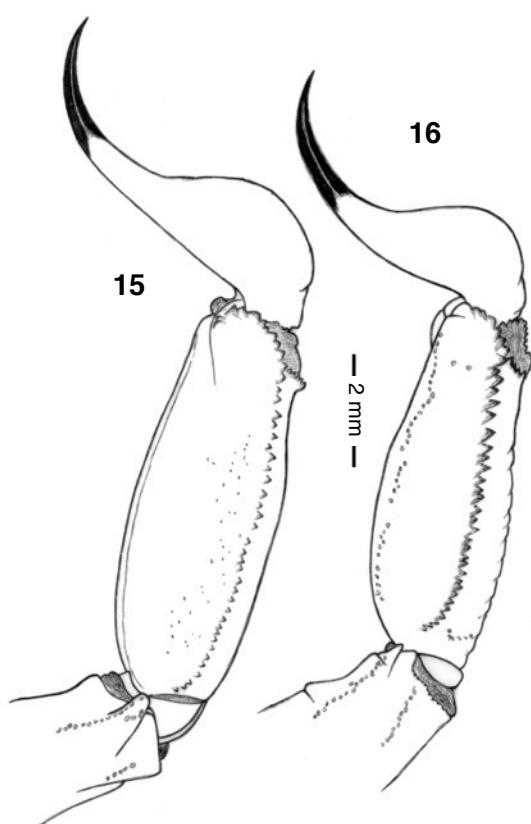
**Fig. 10-14.** *Buthiscus ifoghas* n. sp., ♂ holotype, trichobtrial pattern. 10. Femur, dorsal. 11-12. Patella. 11. Dorsal. 12. External. 13-14. Chela. 13. Dorsal. 14. Ventral.

small lobes. Tibial spurs absent on leg III and extremely reduced on IV. Pectines small not overlapping in the anterior region, with 21-21 teeth. Trichobothriotaxy of type A with  $\beta$  (beta) configuration for the dorsal trichobothria of femur; majorante neobothriotaxy with the presence of three external trichobothria on the femur; femur trichobothrium  $d_5$  distal in relation to  $e_3$ ; chela trichobothrium  $et$  strongly distal.

**Description** (based on male holotype, measurements in Table I).

**Coloration.** – Generally yellowish orange with aculeus and chela fingers darkened. Prosoma: Carapace yellowish orange, slightly paler in the anterior zone; eyes surrounded by light brownish pigment. Mesosoma: tergites yellowish orange, slightly paler in the median zone. Metasomal segments I to V yellowish orange. Vesicle yellow; aculeus reddish at the base and brownish at the tip. Venter yellowish; pectines pale yellow. Chelicerae yellow to pale yellow; denticles dark red. Pedipalps yellowish with chela yellowish orange; fingers reddish orange; rows of granules on the dentate margins of the fingers reddish. Legs yellow, paler than body.

**Morphology.** – Anterior margin of carapace moderately convex. Carapace carinae weakly developed; anterior median carinae weak to obsolete; central median, posterior median and central lateral carinae weak to obsolete. All furrows weak. Intercarinal spaces weakly granular to smooth. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by almost two ocular diameters. Four pairs of small lateral eyes, disposed in one line, the fourth extremely reduced. Mesosoma: Tergites I-VI tricarinate; all carinae extremely weak; lateral carinae vestigial on segment I; tergite VII pentacarinate, with lateral pairs of carinae moderate; median carinae present on proximal one-half, moderately marked. Intercarinal spaces mostly



**Fig. 15-16.** Metasomal segment V and telson, lateral.

15. *Buthiscus bicalcaratus*, ♂ from Souf, Northeastern Algeria.  
16. *Buthiscus ifoghas* n. sp., ♂ holotype.

smooth and lustrous with some thin granulations laterally. Sternites: carinae absent from sternites III-VI; moderate to weak on VII. Pectines small, not overlapping on the anterior region; pectinal tooth count 21-21. Metasomal segments I to III with 10 carinae; IV with 8 carinae; intermediate carina strongly reduced on II and III. Ventral carinae weak on segment I, stronger on II to IV; dorsal carinae with some spinoid granules on segments I to III. Segment V with five carinae; latero-ventral armed with strong spinoid granules and some minor lobes. Dorsal furrows in all segments weakly developed, smooth; intercarinal spaces smooth dorsally, minutely granular laterally and ventrally. Metasomal setation almost absent. Telson partially smooth with some ventral granulations. Aculeus longer than vesicle; subaculear tubercle absent; setation absent. Chelicerae: movable finger with external distal denticle shorter than internal distal; two reduced but not fused denticles at the base of the movable finger (Vachon, 1963). Pedipalps: Trichobothrial pattern majorante neobothriotaxy, type A as defined by Vachon (1974), with dorsal trichobothria of femur in  $\beta$  (beta) configuration (Vachon, 1975); see diagnosis for other details. Femur pentacarinate; all carinae moderately crenulate. Patella with dorso-internal and ventro-internal carinae; internal face with spinoid granules; chela smooth without carinae. Dentate margins on fixed and movable fingers composed of 8-9 almost fused rows of granules; internal and external accessory granules weakly marked. Legs: ventral aspect of tarsi with numerous long thin setae; general setation typical of a psammophilous species. Tibial spurs absent from leg III and extremely reduced on IV. Pedal spurs moderate on all legs.

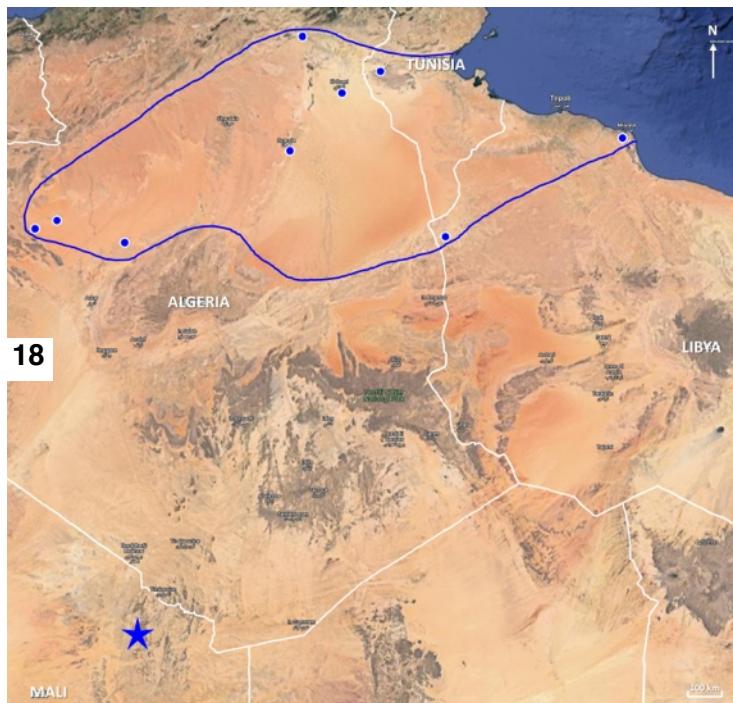
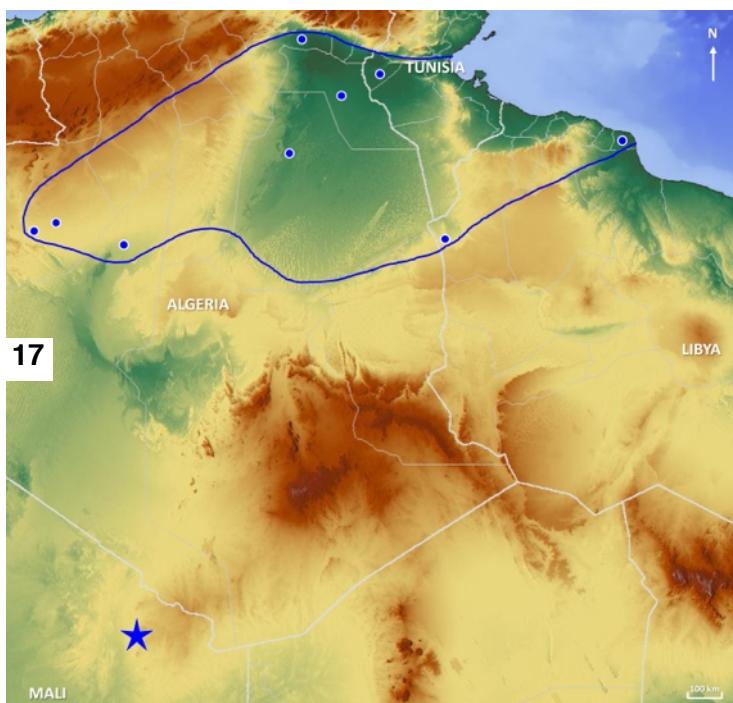
**Etymology.** – The specific name is placed in apposition to the generic name and refers to the Adrar des Ifoghas, where the new species was found.

**Comparisons.** – The new species shows several common aspects in relation to *Buthiscus bicalcaratus*, however, it can be distinguished notably by the following features: (i) slightly darker general coloration in the new species, (ii) anterior margin of carapace moderately convex, while it is straight in *B. bicalcaratus*, (iii) latero-ventral carinae on metasomal segments V more strongly marked in the new

species with some conspicuous spiniform granules, (iv) pedipalp chela fingers more strongly scalloped in the new species, (v) pectines smaller in the new species, (vi) femur trichobothrium  $d_5$  distal in relation to  $e_3$  (proximal in *B. bicalcaratus*) and chela trichobothrium  $et$  strongly distal in the new species and (vii) several different morphometric ratios (see tab. I) including slender pedipalp chela (chela length/width ratio 2.79 in the new species, 2.70-2.74 in *B. bicalcaratus*; chela manus width / patella width ratio 1.23 in the new species, 1.31-1.34 in *B. bicalcaratus*), longer pedipalp chela fingers (movable finger length / manus length ratio 1.30 in the new species, 1.23-1.25 in *B. bicalcaratus*), longer metasoma (metasoma length / carapace length ratio 5.51 in the new species, 4.88-5.03 in *B. bicalcaratus*) and telson deeper than wide in the new species (width/depth ratio 0.95) while wider than deep in *B. bicalcaratus* (width/depth ratio 1.09). Moreover, Principal Component Analysis (PCA) and Ascending Hierarchical Classification (AHC) were conducted using all morphometric values presented in tab. I, confirming the difference between the new species and *B. bicalcaratus* (see fig. 19). Finally, the two species present a totally allopatric geographic distribution and inhabit different habitats (the Mali population seems to correspond to a species of altitude; see ecological and biogeographical section).

### Ecological and biogeographical comments on the Region of Kidal

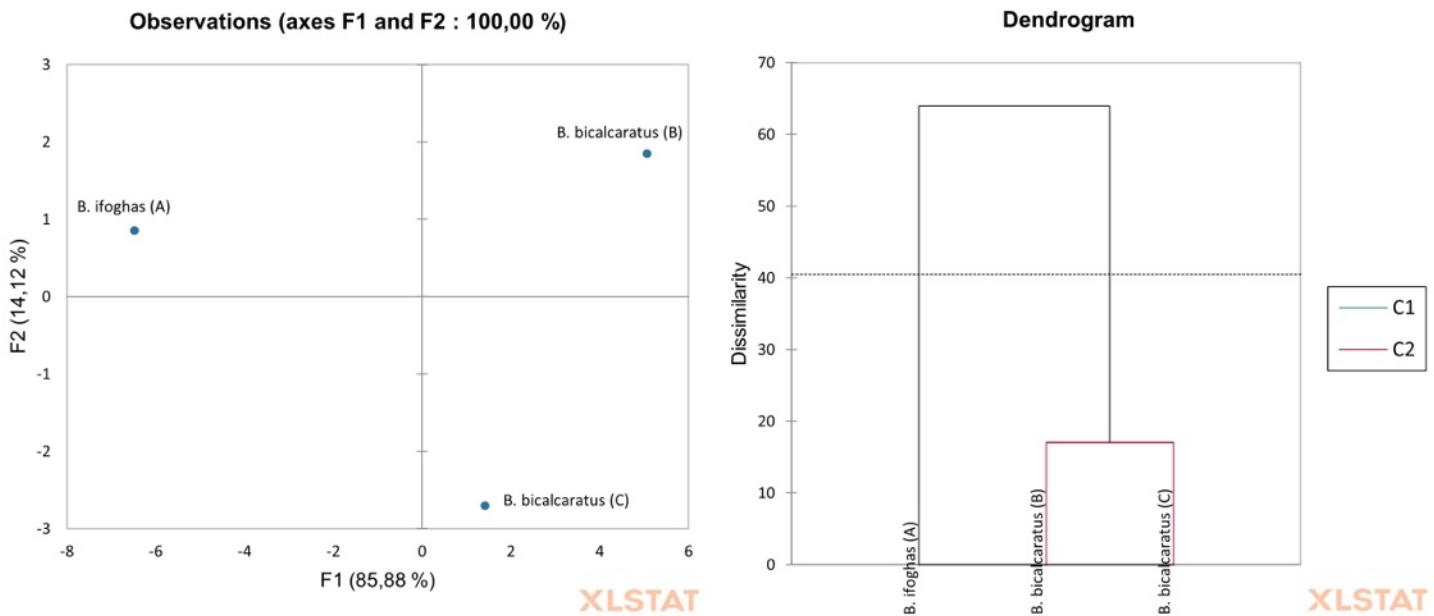
As already exposed in a previous publication (Lourenço, 2021), during the field expedition performed by the late Prof. J. Millot during the 1930s in the territory of the Afrique-Occidentale Française, a number of scorpions have been collected. One was *Butheoloides milloti* Vachon, 1948, collected in Sangha, in the region of Mopti; specimens collected under tree bark. Another scorpion collected was the recently described *Orthochirus milloti* Lourenço, 2021; the type specimen was collected in a zone less arid than that of the region of Aguel'hoc, which corresponds in part to the Tilemsi Valley, where a reasonable



**Fig. 17-18.** Known records (blue circles) and approximate supposed zone of distribution (blue line) of *Buthiscus bicalcaratus*, and the type locality of *Buthiscus ifoghas* n. sp. (blue star). **17.** Relief map. **18.** Satellite map.

**Table I.** – Morphometric values (mm) of the holotype male of *Buthiscus ifoghas n. sp.* (**A**), a male *Buthiscus bicalcaratus* from Souf in Northeastern Algeria (**B**) and a male *Buthiscus bicalcaratus* from Béni Abbès in Central Western Algeria, lectotype of *Trichobuthus guebleri* (**C**).

	<b>A</b>	<b>B</b>	<b>C</b>
<b>Total length (telson included)</b>	66.3	73.4	69.4
<b>Carapace:</b>			
- <b>length</b>	7.7	8.1	7.4
- <b>anterior width</b>	4.3	4.7	4.3
- <b>posterior width</b>	8.2	8.6	8.5
<b>Mesosoma length</b>	16.5	17.2	16.6
<b>Metasomal segment I:</b>			
- <b>length</b>	5.4	6.0	5.9
- <b>width</b>	4.2	4.6	4.6
<b>Metasomal segment II:</b>			
- <b>length</b>	6.3	7.2	6.7
- <b>width</b>	4.3	4.5	4.5
<b>Metasomal segment III:</b>			
- <b>length</b>	6.7	7.8	7.2
- <b>width</b>	4.4	4.5	4.5
<b>Metasomal segment IV:</b>			
- <b>length</b>	7.7	8.8	8.3
- <b>width</b>	3.9	4.2	4.2
<b>Metasomal segment V:</b>			
- <b>length</b>	8.6	9.7	9.1
- <b>width</b>	3.4	3.7	3.8
- <b>depth</b>	2.8	3.2	3.0
<b>Telson:</b>			
- <b>length</b>	7.4	8.6	8.2
- <b>width</b>	2.1	2.5	2.5
- <b>depth</b>	2.2	2.3	2.3
<b>Pedipalp:</b>			
- <b>femur length</b>	5.9	6.2	6.0
- <b>femur width</b>	2.3	2.4	2.3
- <b>patella length</b>	7.2	7.4	7.4
- <b>patella width</b>	3.1	3.2	3.2
- <b>chela length</b>	10.6	11.6	11.5
- <b>chela width</b>	3.8	4.3	4.2
- <b>chela depth</b>	4.0	4.5	4.3
<b>Movable finger length</b>	6.0	6.4	6.4



**Fig. 19.** Principal Component Analysis (PCA) and Ascending Hierarchical Classification (AHC) conducted on all morphometric values of the three specimens presented in Tab. I.

number of trees could be observed (Lourenço, 2021). *Orthochirus milloti* was also collected under tree bark. The new *Buthiscus* species was collected in the ‘North of Kidal’ (at this period it corresponded to the city of Kidal, not the administrative region), around Aguel’hoc, in a mountain zone of moderate altitude. The region of Aguel’hoc is indeed located in a mountain area which corresponds to the Tigharghar Massif, in the Southwestern part of the Adrar des Ifoghas, in a semi-arid environment. In the North of the Tlemesi Valley, the territory comprises several different ecological habitats including some mountain zones on its oriental portion. This suggests that the new *Buthiscus* inhabits mountainous environments, contrarily to *B. bicalcaratus* which is a typical species of low altitude desert areas ranging from Northwestern Libya to Central Western Algeria. A barrier or area of transition clearly appears between the zones of distribution of the two populations.

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## Résumé

Ythier E. & Lourenço W. R., 2023. – Une nouvelle espèce de *Buthiscus* Birula, 1905 (Scorpiones: Buthidae) de l'Adrar des Ifoghas au Mali. *Faunitaxys*, 11(22): 1 – 7.

Une nouvelle espèce de scorpion appartenant au genre *Buthiscus* Birula, 1905 (Buthidae) est décrite du Sud-Ouest de l'Adrar des Ifoghas, dans la région de Kidal au Mali : *Buthiscus ifoghas* n. sp. C'est le deuxième élément appartenant au genre *Buthiscus*. Elle semble être inféodée aux milieux montagneux, à l'inverse de l'autre espèce du genre, *Buthiscus bicalcaratus* Birula, 1905 typique des zones désertiques de basse altitude.

Mots-clés. – Scorpion, Buthidae, *Buthiscus, ifoghas*, taxonomie, morphologie, nouvelle espèce, description, montagne, Adrar des Ifoghas, Kidal, Mali.

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# Faunitaxys

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### ***Illustration de la couverture :***

Rocks in the Adrar des Ifoghas.

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