

Lissothus guezzamensis sp. nov. from In Guezzam Province, Algeria (Scorpiones: Buthidae)

Ersen Aydın YAĞMUR^{1*}, Nouredine BENALI², Lotfi DERRADJ^{3,4}

¹Manisa Celal Bayar University, Alaşehir Vocational School, Alaşehir, Manisa, 45600 TÜRKİYE

²Department of Ecology and Environment and Biotechnology, and Faculty of Nature and Life Sciences, Laboratory of Agro Biotechnology and Nutrition in Semi-Arid Areas, Ibn Khaldoun University of Tiaret, ALGERIA

³Research Laboratory Of Sciences And Environment, Department of Biology, Faculty of Science and technology, University of Amine Elokkel El Hadj Moussa Eg Akhamouk, Tamanghasset, ALGERIA

⁴Arthropods Biosystematics and Ecology Laboratory, Department of Animal Biology, Frères Mentouri Constantine 1 University, Constantine, ALGERIA

ORCID ID: Ersen Aydın YAĞMUR: <https://orcid.org/0000-0002-0396-3975>; Nouredine BENALI: <https://orcid.org/0009-0000-5325-9698>; Lotfi DERRADJ: <https://orcid.org/0000-0001-8751-6568>

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Abstract: *Lissothus guezzamensis* sp. nov. is described here based on four adult female specimens from the In Guezzam Province, Algeria. Detailed illustrations and measurements are provided. *L. guezzamensis* sp. nov. can be distinguished from all the other known species by its coloration pattern, the dentition of the chela fingers, the carination and granulation of the fifth metasomal segment, and the shape of sternite VII.

Keywords: Description, scorpion, new species, taxonomy, Africa.

Cezayir'in In Guezzam Bölgesi'nden *Lissothus guezzamensis* sp. nov. (Scorpiones: Buthidae)

Öz: *Lissothus guezzamensis* sp. nov., Cezayir'in In Guezzam Bölgesi'nden elde edilen dört erişkin dişi örneğe dayanarak burada tanımlanmaktadır. Ayrıntılı çizimler ve ölçümler sunulmuştur. *L. guezzamensis* sp. nov., genel renklenmesi, chela parmaklarının granül özellikleri, beşinci metasomal segmentin karinasyonu ve granülasyonu ile VII. sternitin şekli açısından bilinen tüm diğer türlerden ayırt edilebilir.

Anahtar kelimeler: Deskripsyon, akrep, yeni tür, taksonomi, Afrika.

1. Introduction

Lissothus Vachon, 1948 is one of the least known genera of scorpions. To date, only three species of the genus *Lissothus* have been described from North Africa. Vachon (1948) established the genus *Lissothus* with the description of *L. bernardi*, based on a single female specimen from Libya (Fezzan Province). This species has not been collected since its original description. Shortly after, Vachon (1950) described *L. occidentalis* from Mauritania. Lourenço (2001) reported an additional record of this species from Mauritania (Atar, Adrar) and, more recently, it has been recorded in Morocco, specifically in the Souss-Massa region; Zag and Targa Wassay, Guelmim-Oued Noun region; and Smara, Es Semara Province, Western Sahara and was redescribed by Stockmann et al. (2016). Much later, a third species, *L. chaambi*, was described from a few localities in Ghardaïa Province, Algeria by Lourenço & Sadine (2014). Until recently, the genus *Lissothus* had only been recorded in the north-central region of Algeria and has not been reported from southern regions.

Here, we describe a new species of *Lissothus* and report a new locality for the genus. The locality we report is approximately 1,700 km from the type locality of *L. chaambi* in Ghardaïa Province (Lourenço & Sadine, 2014) and about 1,400 km from the type locality of *L. bernardi* in Fezzan Province, specifically El Abiod (Vachon, 1948).

This study aims to describe a new species, *L. guezzamensis* sp. nov., from the In Guezzam Province of Algeria.

2. Material and Methods

Specimens of *L. guezzamensis* sp. nov. were collected from the In Guezzam region by hand and preserved in 70% ethyl alcohol. Illustrations were prepared with the method described in Yağmur (2021). The holotype specimen is deposited in Alaşehir Zoological Museum (AZMM), Manisa Celal Bayar University, Alaşehir, Manisa, Turkey. Two females of paratypes are deposited at Ibn Khaldoun University of Tiaret. The trichobothrial nomenclature follows Vachon (1974) and morphological terminology follows Stahnke (1971) and Hjelle (1990).

3. Results

Family Buthidae C. L. Koch, 1837

Lissothus Vachon, 1948

Lissothus guezzamensis sp. nov.

Type Locality and Type Repository. Holotype, Algeria, In Guezzam Province, In Guezzam District, In Guezzam Town, 19°33'04"N, 5°46'25"E, 402 m, 1 ♀, 8 February 2025, leg. Lotfi Derradj (AZMM/SCO-2025:4). 3 ♀, 12 February 2025, leg. Lotfi Derradj (Fig. 1).

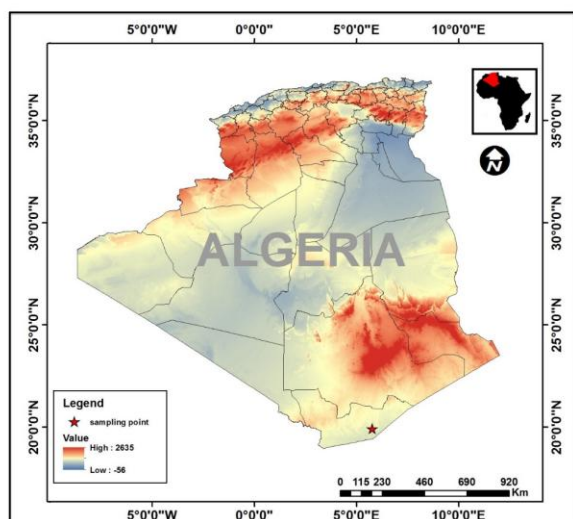


Figure 1. Map of Algeria showing the collection site of *Lissothus guezzamensis* sp. nov.

3.1. Etymology

The specific name refers to In Guezzam Province where the specimens of the new species were collected.

3.2. Affinities

Lissothus guezzamensis sp. nov. is distinguished from *L. chaambi* by the following characters:

(a) The ventrolateral carinae of the fifth metasomal segment bear rounded denticles in *L. guezzamensis* sp. nov., whereas in *L. chaambi*, the denticles are somewhat spinoid in shape.

(b) Two internal accessory denticles are present on the movable finger of the pedipalp in *L. guezzamensis* sp. nov. but are absent in *L. chaambi* according to Lourenço & Sadine (2014: 420, Fig. 3I).

(c) The posterior two-thirds of the ventral surface of metasomal segment IV is orangish-brown in *L. guezzamensis* sp. nov. compared to dark reddish brown in *L. chaambi*.

(d) Metasomal segments I-III almost glabrous in *L. guezzamensis* sp. nov., whereas ventral surfaces of segments I-III with several distinct and long setae in *L. chaambi*.

L. guezzamensis sp. nov. is distinguished from *L. occidentalis* by the following characters:

(a) Metasomal segments IV-V and the anterior part of the interocular triangle are faint reddish-brown in *L. guezzamensis* sp. nov., whereas they are fuscous in *L. occidentalis*.

(b) Metasomal segments I-III almost glabrous in *L. guezzamensis* sp. nov., whereas they bear several distinct setae in *L. occidentalis*.

(c) The ventrolateral carinae of the fifth metasomal segment bear 6-7 coarse denticles and one large denticle in *L. guezzamensis* sp. nov., whereas *L. occidentalis* specimens used in the redescription by Stockmann et al. (2016) bear 3-4 coarse denticles and one large denticle. However, the juvenile holotype specimen bears several thin and

elongated denticles.

(d) The vesicle bears an indistinct subaculear tubercle in *L. guezzamensis* sp. nov., whereas it lacks a subaculear tubercle in *L. occidentalis*.

L. guezzamensis sp. nov. is distinguished from *L. bernardi* by the following characters:

(a) General coloration ranges from pale dark yellow to pale orangish-yellow in *L. guezzamensis* sp. nov., whereas it is uniformly light straw-yellow in *L. bernardi*.

(b) Sternite VII bears four weak and inconspicuous smooth carinae in *L. guezzamensis* sp. nov., whereas it is completely smooth and lacks carinae in *L. bernardi*.

(c) Two internal accessory denticles are present on the movable finger of the pedipalp in *L. guezzamensis* sp. nov. compared to a single accessory denticle in *L. bernardi*.

(d) The anterior margin of the carapace is moderately concave in *L. guezzamensis* sp. nov., whereas it is slightly concave in *L. bernardi*.

(e) The ventral surface of the vesicle is densely granular in *L. guezzamensis* sp. nov., whereas it is only slightly granular in *L. bernardi*.

3.3. Diagnosis

General coloration pale dark yellow to pale orangish yellow; with the posterior two-thirds of the ventral surface of metasomal segment IV orangish-brown. Total body lengths ranges from 34.77 to 20.45 mm. The carapace is trapezoidal, with the anterior margin of the carapace moderately concave. The surface shagreened with small smooth patches and lacks carinae. Three pairs of lateral eyes are present, including two large and one vestigial. The movable finger of chelicerae bears two large ventral denticles (Vachon, 1963). The sternum is subtriangular and elongated. The pectinal tooth count in females (n=4) ranges from 15-17. The trichobothrial pattern in pedipalps orthobothriotaxic, type A (Vachon, 1974); dorsal trichobothria on the femur exhibiting the β -configuration (Vachon, 1975). Trichobothrium *d2* is absent on the pedipalp femur but present on the pedipalp patella. Trichobothrium *esb* is absent on the fixed finger of the chela. Trichobothrium *et* is located approximately midway between trichobothria *dt* and *db*, while trichobothrium *est* is situated basal to *db* and relatively closer than *et*. Trichobothrium *eb* is located far from *est*. The femur is pentacarinat and the patella bears three carinae. The chela is elongated and slender (chela length/manus width ratio = 5.98; chela length/manus depth ratio = 6.45). The chela fingers are elongate, slender, and strongly curved inwards (movable finger length/manus length ratio = 2.03). The dentate margin of the movable finger consists of a linear row of small denticles, divided into five non-imbricated rows. Two of the median denticles are slightly enlarged, while the other three are indistinct. Additionally, two internal accessory denticles, two terminal granules, and one distal terminal granule present. The dentate margin of the fixed finger bears a linear row of granules, including three enlarged median denticles accompanied by three internal granules. Tergites I-VI bear a weak and smooth median carina, while tergite VII pentacarinat. The surfaces of tergites I-VII are smooth to rough. Sternites III-VI lack carinae, while sternite VII bears four weak and

inconspicuous smooth carinae. The metasomal segments are moderately slender, with the following length-to-width (L/W) ratios: I = 1.42, II = 1.77, III = 1.95, IV = 2.16, V = 2.05. Segments I-III bear 10 carinae; segment IV lacks carinae and segment V bears four carinae. Segment IV is rounded, smooth, and lustrous, lacking carinae. Segment V is rounded, smooth, and lustrous, lacking carinae. Segment V is rounded, ventrolateral carinae strong and granular on the posterior two-thirds, bearing 6-7 coarse and one large rounded denticles. The anal arch consists of 12 small ventral granules and four partly divided lateral lobes. The vesicle bulbous is (telson length/width ratio = 2.14; vesicle length/width ratio = 1.4) rough and densely granular ventrally, with an indistinct subaculear tubercle. The aculeus is abruptly curved and shorter than the vesicle (aculeus/vesicle ratio = 0.67).

3.4. Description

The total length of the female holotype is 34.77 mm. Additional measurements are given in Table 1.

3.4.1. Coloration

The general coloration ranges from pale dark yellow to pale orangish yellow (Fig. 2).

Carapace: Pale orangish yellow, with the area between the median eyes black, surrounded by regions that are reddish-brown to reddish-black and exhibiting slightly reticulate. The interocular triangle displays faint reddish-brown reticulations. The posterior area of the median eyes is reddish-brown with dark yellow marbling.

Table 1. Measurements of male holotype of *Lissothus guezzamensis* sp. nov. Abbreviations: length (L), width (W, posterior width), depth (D).

<i>Lissothus guezzamensis</i> sp. nov.		
Dimensions (mm)		♂, holotype
Carapace	L/W	3.52/3.54
Mesosoma	L	12.00
Tergite VII	L/W	2.73/3.78
Metasoma + telson	L	19.25
Segment I	L/W/D	2.69/1.89/1.57
Segment II	L/W/D	3.02/1.70/1.56
Segment III	L/W/D	3.33/1.70/1.64
Segment IV	L/W/D	3.66/1.69/1.65
Segment V	L/W/D	3.55/1.73/1.46
Telson	L/W/D	3.00/1.40/1.17
Vesicle	L	1.96
Aculeus	L	1.32
Pedipalp	L	14.50
Femur	L/W	3.86/0.96
Patella	L/W	4.12/1.19
Chela	L	6.52
Manus	L/W/D	2.20/1.09/1.01
Movable finger	L	4.47
Total	L	34.77

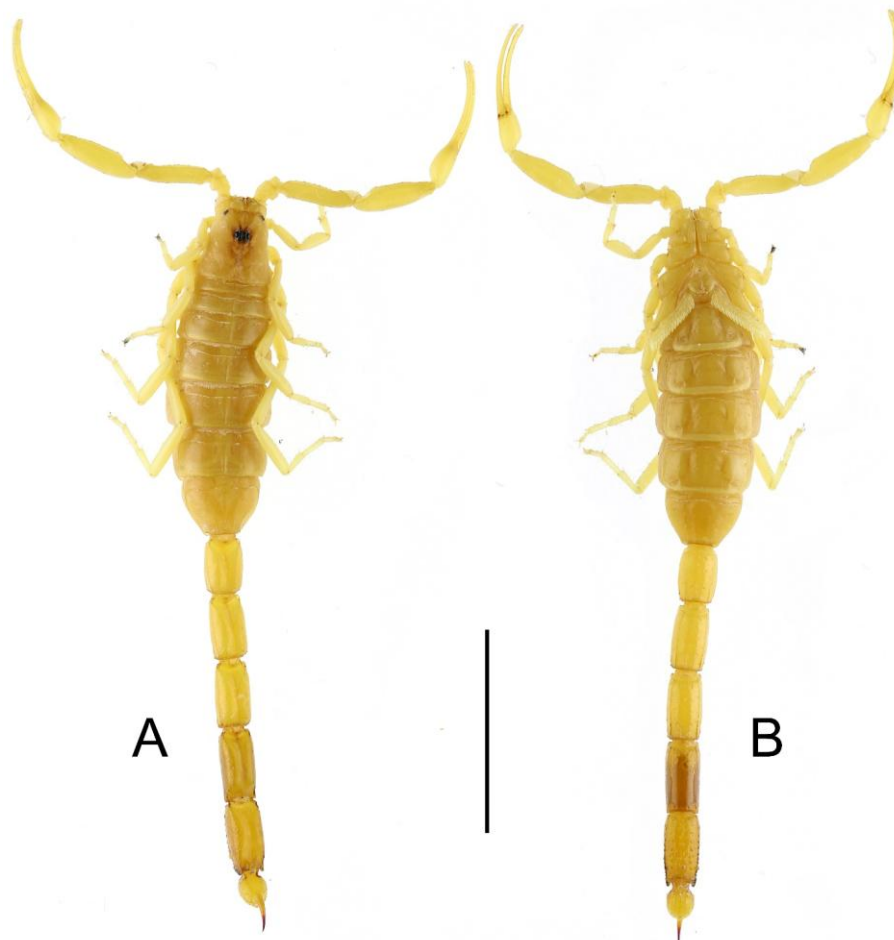


Figure 2. *Lissothus guezzamensis* sp. nov., general views of female holotype. A: Dorsal views. B: Ventral views. Scale bar: 10 mm.

Chelicerae: including manus and fingers, are lustrous yellow lack reticulation; teeth yellowish red.

Pedipalps: The femur and patella are pale yellow, with carinae that are slightly greyish yellow. The chela is pale yellow; fingers are dark yellow, becoming greyish yellow at the base. Condyles are reddish; denticles on the dentate margins of the fingers reddish to reddish-brown. Legs: Pale light yellow; spinules reddish-brown.

Mesosoma: Tergites orangish. General coloration ranges from pale dark yellow to pale orangish yellow.

Metasoma: Metasomal segments I-III orangish yellow. Segment IV exhibits light reddish-brown reticulations and dark yellow marbling laterally; is yellow with greyish-yellow reticulations dorsally; and is orangish-brown posterior two-thirds ventrally, with orangish-brown reticulations and dark yellow marbling on the posterior one-third. Segment V displays slight reddish-brown reticulations and dark yellow marbling laterally; is pale dark yellow dorsally; and orangish brown ventrally. Granules on the ventrolateral carinae are light reddish black; and the lateral lobes of the anal arch reddish black on segment V. The vesicle is lustrous orangish-yellow; and the aculeus is reddish yellow at the base, becoming reddish toward the tip.

3.4.2. Morphology

Prosoma (Fig. 3C): The carapace is trapezoidal, narrowing in the anterior one-fourth, and approximately equal in width and length. The anterior margin of the carapace moderately concave. The surface shagreened with small smooth patches and lacks carinae. The median eyes are positioned anterior to the center of the carapace, with the distance from the center of the median eyes to the anterior margin representing 0.36 of the carapace length. The median eyes are relatively large and separated by one ocular diameter. Three pairs of lateral eyes are present, consisting of two large pairs and one vestigial pair). Both anteromedian and posteromedian furrows are present but very shallow.

Chelicerae (Fig. 3C): The surface of the manus is lustrous and smooth, with flattened fine granules arranged in longitudinal rows anteriorly. The movable finger bears two large ventral denticles (Vachon, 1963).

Sternum: Sternum subtriangular and elongated.

Pectines (Fig. 3D): The pectines are moderately long, narrow, and densely setose, extending slightly beyond the coxa/trochanter joint of leg IV. The pectinal tooth count is 15-16.

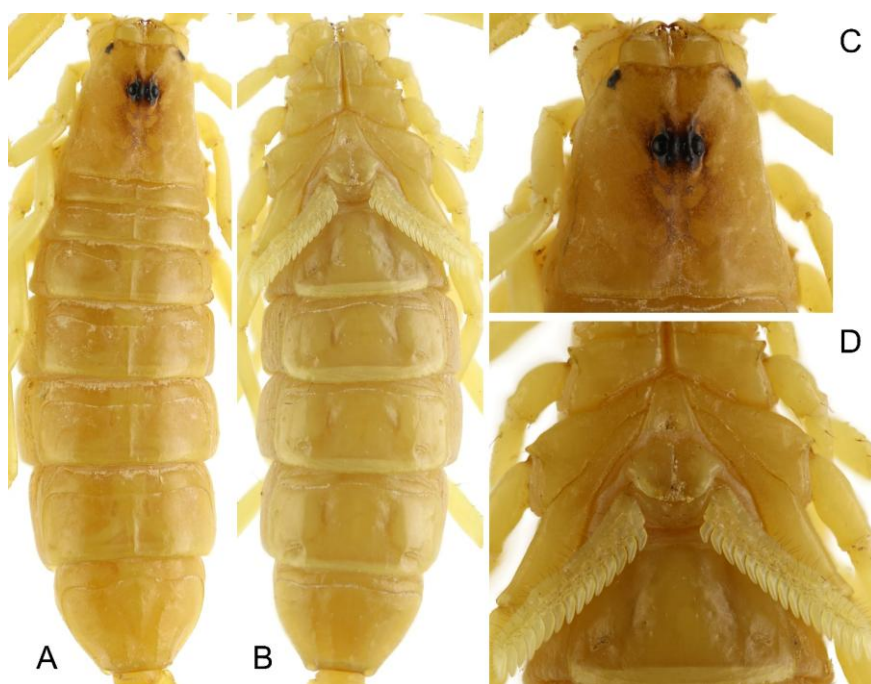


Figure 3. *Lissothus guezzamensis* sp. nov., carapace, mesosoma and coxal and sternoplectinal area of female holotype. A: Dorsal view of mesosoma. B: Ventral view of mesosoma. C: Carapace. D: Coxal and sternoplectinal area.

Pedipalps (Fig. 4): The trichobothrial pattern is orthobothriotaxic, type A (Vachon, 1974); with dorsal trichobothria on the femur in the β -configuration (Vachon, 1975). Trichobothrium *d2* is absent on the pedipalp femur but present on the pedipalp patella. Trichobothrium *esb* is absent on the fixed finger of the chela. Trichobothrium *et* is located approximately midway between trichobothria *dt* and *db*, while trichobothrium *est* is situated basal to *db* and relatively closer than *et*. Trichobothrium *eb* is located far from *est*. **Femur:** The femur is pentacarinata. The dorsointernal carina is strong, bearing moderate, rounded granules. The dorsoexternal and ventrointernal carinae moderate, with irregular small granules. The internal

carina is strong and crenulate, with 5-6 irregular, coarse, and spaced subconical granules. The external median carina is weak and nearly smooth, bearing 7-8 subspinoid and flattened granules. The dorsal and ventral surfaces are sparsely granular, with fine granules. **Patella:** Patella bears three carinae. The dorsointernal carina is moderate and faintly crenulate, bearing 7-8 barely developed, subconical granules, the dorsal patellar spur is barely developed. The ventrointernal carina is weak, with spaced, irregular, minute, and fine granules; the ventral patellar spur is absent. The dorsal carina weak, smooth to finely and irregularly granular. The remaining carinae are completely vestigial or absent.



Figure 4. *Lissothus guezzamensis* sp. nov., pedipalp segments of female holotype. A-D: Chela ventral (A), dorsal (B), internal (C) and external (D) views. E-F: Pedipalp ventral (E) and dorsal (F) views. G-H: Movable finger (G) and fixed finger (H) dentitions. Trichobothrial pattern is indicated by red circles.

Chela: The chela is elongated and slender, with a chela length/manus width ratio = 5.98; chela length/manus depth ratio = 6.45. The chela manus is rounded, short, and thin, without carinae. The chela fingers are elongate, slender, and strongly curved inwards, with movable finger length/manus length ratio = 2.03. The surface of the manus is smooth and sparsely setose, with long, distinct setae. The dentate margin of the movable finger consists of a linear row of small denticles, divided into five non-imbricated rows. Two of the median denticles are slightly enlarged, while the other three are indistinct. Additionally, two internal accessory granules, two terminal granules, and one distal terminal granule present. The dentate margin of the fixed finger bears a linear row of granules, including three enlarged median denticles accompanied by three internal granules.

Legs (Fig. 5): Leg pairs III and IV bear weak tibial spurs. Leg pairs I-IV possess moderate tarsal spurs. The telotarsus of each legs bear two rows of stocky spinules, while the basitarsus bear two slightly spiniform rows of spinules. Basitarsus I-III bear bristle-combs, each consisting of 4-5 retrosuperior macrosetae.

Mesosoma (Fig. 3): Tergites I-VI bear a weak and smooth median carina. Tergite VII is pentacarinata, with weak, slightly granular submedian and lateral carinae, and an inconspicuous, smooth median carina. The surfaces of tergites I-VII are smooth and rough. Sternites III-VI lack carinae and have smooth and lustrous. Sternite VII bears

four weak and inconspicuous smooth carinae, with a smooth surface.



Figure 5. *Lissothus guezzamensis* sp. nov., tibia and basitarsus of right legs I-IV of female holotype.

Metasoma and telson (Fig. 6): The metasomal segments are moderately slender, with the following length-to-width (L/W) ratios: I = 1.42, II = 1.77, III = 1.95, IV = 2.16, V = 2.05. Segment width decreases posteriorly, although segments II and III are of equal width. Segments I-III bear 10 carinae; segment IV lacks carinae; segment V bears four carinae. The lateral inframedian carinae on segments I-III weak and smooth, complete on segment I but incomplete on segments II-III. Dorsolateral carinae are faintly crenulate to smooth and bear two closely located granules at the posterior end of segment I (one moderate and one enlarged). In segments II-III they are smooth and bear one enlarged, flattened granule posteriorly. Lateral supramedian carinae are weak and smooth on segments I-III. Ventrolateral carinae are moderate and smooth on segments I-III but granular on the posterior quarter of segments I-II with fine granules, and granular on segment III with moderate granules. Ventral submedian carinae are weak and smooth on segments I and II and faintly granular in the posterior quarter of segment III. Intercarinal surfaces are somewhat rough and lack granulation on segments I-III. The intercarinal surfaces of segments I-III are smooth and without granules. Segments I-III are sparsely setose, bearing short and indistinct setae. Segment IV: Rounded, smooth, and lustrous, lacking carinae; scattered fine granules present, glabrous. Segment V: Rounded, smooth to slightly rough. Dorsolateral carinae are rounded and smooth; ventrolateral carinae are strong and granular on the posterior two-thirds, bearing six coarse and one large, rounded denticles. The anal arch consists of 12 small ventral granules and four partly divided lateral lobes. All surfaces are smooth, except for the ventral surface, which is densely covered with coarse, rounded granules. Segment V is sparsely hirsute. Dorsal furrows of all segments are shallow and smooth. Telson: The vesicle is bulbous (telson length/width ratio = 2.14; vesicle length/width ratio = 1.4), rough and densely granular ventrally, with an indistinct subaculear tubercle. The

aculeus abruptly curved and shorter than the vesicle (aculeus/vesicle ratio = 0.67).



Figures 6. *Lissothus guezzamensis* sp. nov., metasoma and telson of female holotype. A-C: Metasoma, ventral (A), dorsal (B) and lateral (C) views. D-E: Metasoma segment V and telson, ventral (D) and lateral (E) views. F-G: Metasoma segment IV, ventral (F) and lateral (G) views.

3.5. Habitat Description and Ecological Observations

The Guezzam region, located in the extreme southern part of Algeria near the border with Niger, lies within the central Saharan Desert. The landscape is predominantly composed of rocky plateaus (*hamadas*) and stony desert plains (*regs*), interspersed with sand dunes (*ergs*) and dry riverbeds (*wadis*). Soil deposits are limited to valley areas, while the broader terrain remains rocky and arid. Vegetation is extremely sparse due to hyper-arid climatic conditions, with only a few drought-resistant species such as *Acacia* spp. and *Calotropis procera* (commonly known as the Senegalese Sodom apple). Sparse grasses may appear briefly following occasional rainfall events.

Temperatures notably exceed 30°C even during February and March and can surpass 40°C during the peak summer months (July–August). The region harbours a diverse assemblage of desert-adapted fauna including reptiles, small mammals, and arthropods such as scorpions, beetles, and spiders. Scorpions, in particular, exhibit physiological and behavioural adaptations that enable them to survive extreme thermal conditions. As ectothermic organisms, they rely heavily on the availability of microhabitats for thermoregulation. During the hottest parts of the day, individuals typically seek shelter under rocks or retreat into burrows to minimize water loss and avoid lethal body temperatures (Figs. 7-8).

4. Conclusion

With this study, a fourth species is described and the distribution range of the genus *Lissothus* is considerably expanded. Only the female morphology of *L. guezzamensis* sp. nov. is provided in this study, while the male morphology remains unknown as is also the case for *L. bernardi*. Future studies are needed to describe the male morphology of both species.



Figure 7. General view of a live *Lissothus guezzamensis* sp. nov. specimen in its natural habitat.



Figure 8. General views of the habitats of *Lissothus guezzamensis* sp. nov. in the In Guezzam Region.

Ethics committee approval: Ethics committee approval is not required for this study.

Conflict of interest: The author/s declared that they have no conflict of interest.

Author Contributions: Conception – N.B., L.D.; Design – N.B., L.D.; Supervision – E.A.Y.; Fund – L.D.; Materials – N.B., L.D.; Analysis Interpretation – E.A.Y.; Literature Review – E.A.Y.; Writing – E.A.Y., N.B.; Critical Review – N.B., L.D.

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