



First Exhaustive List and Distribution Pattern of Scorpions in Libya (Arachnida: Scorpiones)

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Abstract: Libya, one of the largest countries in North Africa, is characterized by a Mediterranean climate along its northern coast and an extensive hot desert climate across much of its territory. These environmental conditions provide suitable habitats for a diverse assemblage of scorpion species adapted to arid ecosystems. Despite this ecological suitability, the scorpion fauna of Libya remains inadequately documented, with previous studies largely restricted to individual species or limited geographic regions. Therefore, the present study aimed to update the inventory of Libyan scorpions through the examination of specimens collected from several localities between January 2020 and May 2025, combined with a comprehensive review of previously published records. The revised checklist comprises 28 scorpion species belonging to 12 genera and three families. The family Buthidae is the most diverse, encompassing 10 genera and 26 species, whereas the families Euscorpiidae and Scorpionidae are each represented by a single genus and species. A critical taxonomic reassessment resulted in the exclusion of three species – *Androctonus crassicauda*, *Buthus occitanus*, and *Leiurus quinquestriatus* – from the Libyan fauna. Endemic species account for 21.4% of the total diversity, with six species being restricted to Libya. Analysis of species distribution revealed that *Androctonus amoreuxi* and *Androctonus australis* are the most widespread species, each occurring in approximately 75% of the surveyed localities, whereas nine species were

recorded from only a single site. At the regional level, Misurata and Tajura exhibited the highest species richness, each supporting eight scorpion species. Overall, scorpion diversity is particularly pronounced in northwestern Libya, where the convergence of Mediterranean and desert climatic conditions creates favorable habitats for a wide range of taxa. Nevertheless, the country's scorpion fauna remains incompletely explored, highlighting the need for further systematic surveys and taxonomic investigations to achieve a comprehensive understanding of Libya's scorpion biodiversity.

Key words: Scorpiones, Buthidae, Scorpionidae, faunistics, North Africa.

Libya and the rest of North Africa are characterized by an ancient and highly endemic scorpion fauna (Vachon, 1952; Cloudsley-Thompson, 1984; Aboshaala *et al.*, 2022). The climate of Libya is predominantly arid to semiarid, except along the coastal strip and in the northern hills of the eastern and western regions (Essghaier *et al.*, 2015). These environmental conditions play an important role in shaping scorpion biodiversity (Warburg and Ben-Horin, 1981; Prendini, 2005; Lira *et al.*, 2019; Sadine *et al.*, 2023).

The study of scorpion diversity in Libya has evolved considerably over the past decades. Vachon (1952) documented 18 scorpion species from the country. By 1992, this number had increased to 20 species, as reported by El-Hennawy (1992). Subsequently, Fet *et al.* (2000) recognized 21 species, reflecting a gradual increase in the documented diversity. Kaltsas *et al.* (2008) further contributed to the understanding of scorpion distribution in the Mediterranean region by listing 12 species from Libya, including three endemic taxa. Later taxonomic studies described additional species, notably *Buthus lourencoi* Rossi *et al.*, 2013 and *Cicileus latellai* Lourenço and Rossi, 2015. More recently, Aboshaala *et al.* (2020) reported a new locality for *Buthiscus bicalcaratus* in the Misurata region, thereby expanding the known distribution of Libyan scorpions. In addition, the morphology of this species was investigated using specimens collected from the same region (Aboshaala *et al.*, 2022).

Leiurus libycus was originally described by Birula (1908) as *Buthus quinquestriatus libycus* from the "Libyan Desert". Consequently, for more than a century, this taxon was considered to have been described from Libya. The genus *Leiurus* was initially established as a subgenus of *Androctonus* Ehrenberg, 1828, with *Androctonus* (*Leiurus*) *quinquestriatus* as the type species. Vachon (1949) subsequently elevated *Leiurus* to generic rank and recognized a single species, *Leiurus quinquestriatus*. Because *B. quinquestriatus libycus* was originally described as a subspecies of *B. quinquestriatus*, several subsequent studies implicitly reported *L. quinquestriatus* from Libya. However, no study has reliably documented the occurrence of *L. quinquestriatus* in the country. Recently, *L. libycus* was redescribed, its type locality was corrected to Egypt, and the species was removed from the Libyan fauna (Yağmur *et al.*, 2025a). Furthermore, a new species, *Leiurus fezzanensis* Yağmur, Aboshaala and Kovařík, 2025, was described from the Fezzan Province in southwestern Libya (Yağmur *et al.*, 2025a). Therefore, *L. fezzanensis* is currently the only species of *Leiurus* confirmed to occur in Libya.

Because the morphology of *Androctonus crassicauda* sensu stricto remained unclear for a long time, and owing to persistent taxonomic ambiguities within the genus *Androctonus*, many populations from Iran, the Middle East, and Turkey were historically identified as *A. crassicauda* or *Prionurus crassicauda* (Yağmur *et al.*, 2025b). Kaltsas *et al.* (2008) recorded *A. crassicauda* from Libya. However, Barahoei *et al.* (2025) and Yağmur *et al.* (2025b) revised the Iranian populations of *Androctonus* and restricted *A. crassicauda* to the central Iranian plains.

The only taxon considered closely related to *A. crassicauda* is *Androctonus gonneti*, originally described as a subspecies (*Androctonus crassicauda gonneti*) by Vachon (1952) and later elevated to species rank by Lourenço (2005). Consequently, no confirmed populations of *A. crassicauda* remain in North Africa. Accordingly, *A. crassicauda* is excluded from the Libyan fauna in the present study. The specimens reported by Kaltsas *et al.* (2008) may represent either *A. gonneti* or an undescribed species. However, because the taxonomic identity of the Libyan material remains uncertain, it is treated herein as *Androctonus* sp. *Androctonus bicolor longecarinatus* (Caporiacco, 1932) was originally

described as *Prionurus bicolor longecarinatus* from Kufra, Libya. Vachon (1958) subsequently transferred this taxon to the genus *Androctonus*, whereas Pérez (1974) later treated it as a subspecies of *A. aeneas* under the combination *Androctonus aeneas longecarinatus*. Therefore, the type material should be re-examined to clarify its systematic position. Recently, Prendini (2026) reviewed this taxon, elevated it to species rank, and synonymized *Androctonus tenuissimus* Teruel *et al.*, 2013 with it.

Buthus barcaeus was originally described as a subspecies of *Buthus occitanus*, whereas *Buthus tunetanus* (Herbst, 1800) was also long regarded as a subspecies of *B. occitanus* (Vachon, 1952; Fet *et al.*, 2000). However, both taxa were subsequently elevated to species rank. Consequently, no populations currently assigned to *B. occitanus* are known from Libya, and the species has therefore been excluded from the Libyan fauna. At present, *B. occitanus* is restricted to southwestern France and northeastern Spain (Teruel and Turiel, 2021; Blasco-Aróstegui *et al.*, 2025).

Owing to its vast geographical extent, diverse ecosystems, and strategic location along the northern rim of Africa (Makhlouf and Etayeb, 2018), Libya may harbor a greater diversity of scorpions than is currently recognized. Neighboring countries support a substantially richer fauna, with more than 57 species reported from Algeria (Saadi *et al.*, 2025), 36 species from Egypt (Badry *et al.*, 2018), and 68 species and subspecies from Morocco (Touloun *et al.*, 2024). Nevertheless, because relatively few studies have been conducted in Libya, significant gaps remain in our understanding of the country's scorpion fauna, particularly in the southern regions.

Therefore, the objective of the present study is to improve our understanding of scorpion diversity in Libya by compiling and synthesizing all available occurrence records, including newly collected specimens, published literature, verified observations from social media platforms, and records available in online databases.

Materials and Methods

Study area

Libya is a vast country covering approximately 1.76 million km² and is located

along the Mediterranean coast of North Africa (El-Tantawi, 2005; Lariel *et al.*, 2015). Its geographical coordinates extend from 20° to 33° N and from 10° to 25° E (Kottek *et al.*, 2006), with an average elevation ranging from 60 to 80 m above sea level.

The country is characterized by a Mediterranean climate with hot summers in the north and a hot desert climate over most of its territory (Kottek *et al.*, 2006). Rainfall occurs mainly during winter, with annual precipitation ranging from 200 to 300 mm and mean monthly temperatures varying between 14.8°C and 25.9°C (Aboshaala *et al.*, 2022). Much of southern Libya is occupied by the Sahara Desert (El-Tantawi, 2005), where the highest annual thermal amplitude, reaching 23 °C, has been recorded in the Gadamès region (Isnard, 1968).

Precipitation decreases markedly from north to south, reaching only 50-150 mm annually in the southern and western mountain ranges (Isnard, 1968; Al-Idrissi *et al.*, 1996; Laytimi, 2006), with the lowest annual rainfall of 0.7 mm recorded in the Cufra region (Isnard, 1968). More than 63% of Libyan soils are composed of Yermosols with a predominantly loamy texture, while the remaining areas consist of salt flats, rocky surfaces, and sand dunes (Abagandura *et al.*, 2012).

Several studies have shown that desert habitats strongly influence scorpion diversity and distribution (Lourenço and Sadine, 2015; Sadine *et al.*, 2018; Aboshaala *et al.*, 2022; Sadine *et al.*, 2023; Souilem *et al.*, 2025). In the Misurata region of northern Libya, the desert-dwelling scorpions *Androctonus amoreuxi* and *Androctonus australis* are associated with sparse vegetation, low precipitation, and low elevation, whereas some species of *Buthus* are more closely associated with higher elevations. (Aboshaala *et al.*, 2022)

Scorpion sampling and data sources

Scorpion sampling was conducted between January 2020 and May 2025 at several localities representing different habitat types across Libya. Specimens were collected at night using ultraviolet light detection and during the daytime through manual searches beneath rocks and other potential shelters. Owing to the vast geographical extent of the study area,

sampling sites were visited, whenever possible, during different seasons to capture temporal variations in species occurrence.

Data on Libyan scorpions were compiled from all available published sources documenting the occurrence, taxonomy, and distribution of scorpion species in the country, including information on collection localities. The literature was critically evaluated, and only reliable records were retained for the present study.

In addition to published records, new occurrence data for members of the family Buthidae were included under the section "Material examined." These records are based on specimens collected by Dr. Iasmi Stathi of the Natural History Museum of Crete–University of Crete (NHMC–UoC). All examined specimens are deposited in the collections of the NHMC–UoC.

Species distribution maps were generated using QGIS version 3.26 (<https://www.qgis.org/>) to update the distribution of scorpion fauna across the 32 administrative regions of Libya (Fig. 1).

Data Analysis: Statistical analyses were carried out with the occurrence frequency, which was calculated as follows: $C = (p \times 100)/N$ (Magurran, 2004), where C represents the constancy % for each species, p represents the number of departments in which the species

is present, and N represents the total number of departments (32 regions). According to their frequency of occurrence, five species groups are distinguished (Bigot and Bodot, 1973) : very accidental species (Vac), represented by an occurrence of less than 10%; accidental species (Acc), whose occurrence varies between 10 and 24%; common species (Cmt), which are present in 25-49%; constant species (Cst), which are present in 50%-75% and omnipresent species (Omn), whose occurrence is more than 75%.

Results and Discussion

A total of 28 species belonging to three families is reported to occur in Libya. The table below summarizes this list (Table 1). The municipalities where the species is present are indicated by numbers (from 1 to 32) as shown in Figure 1.

The current list of scorpion fauna in Libya comprises 28 species and subspecies, distributed among 12 genera and three families, with six species endemics to the country. In North Africa, Sudan has the most diverse scorpion fauna, with more than 70 species, with fifteen of the family Buthidae (Dupré *et al.*, 2023). Morocco ranks second, with over 68 species and subspecies across twelve genera and two families, and 51 endemic species (Touloun *et al.*, 2024). Algeria is home to 57 species in 16 genera and three families, with 31 endemic species (Saadi *et al.*, 2025). In Egypt, 36 scorpion species

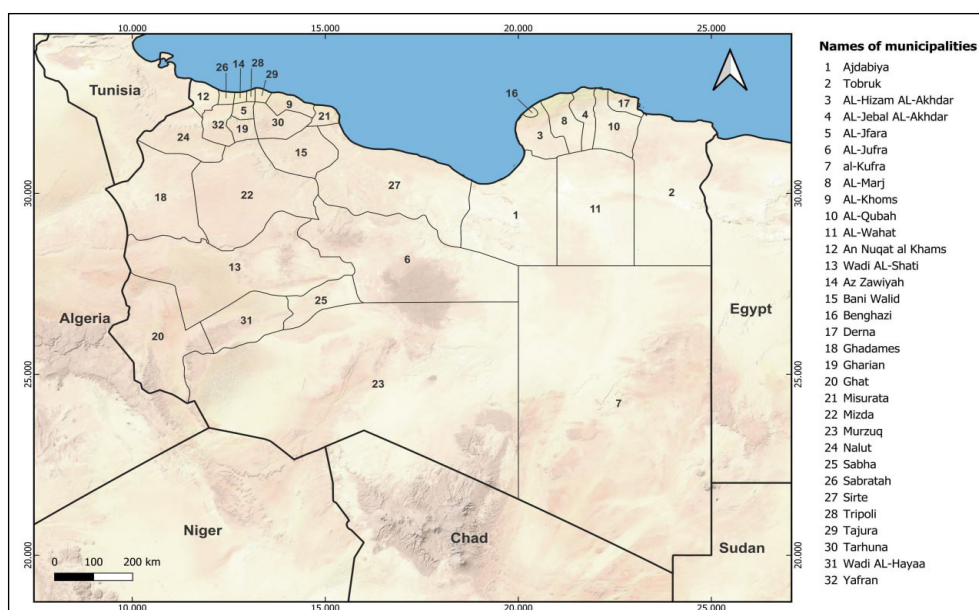


Fig. 1. Map of Libya, showing the different municipalities.

Table 1. Scorpion families and species recorded from different regions of Libya based on published data

Families	Genera	Species	Distribution in Libya	References
Buthidae C. L. Koch, 1837	<i>Androctonus</i> Ehrenberg, 1828	<i>A. aeneas</i> C.L. Koch, 1839	3, 9, 21, 25 and 30	El-Hennawy (1992), Zourgui <i>et al.</i> (2008)
		<i>A. longecarinatus</i> (Caporiacco, 1932) *	3, 9, 21, 25, 28 & 29	Caporiacco, (1932); El-Hennawy (1992); Prendini (2026)
		<i>A. amoreuxi amoreuxi</i> (Audouin, 1826)	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29 and 31	Vachon (1952); El-Hennawy (1992); Zourgui <i>et al.</i> (2008); Kaltsas <i>et al.</i> (2008); Aboshaala <i>et al.</i> (2022)
		<i>A. australis</i> (Linnaeus, 1758)	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 31 and 32	Vachon (1952); El-Hennawy (1992); Zourgui <i>et al.</i> (2008); Kaltsas <i>et al.</i> (2008); Aboshaala <i>et al.</i> , (2022)
		<i>Androctonus</i> sp.**	19	Kaltsas <i>et al.</i> (2008)
		<i>A. tibesti</i> Lourenço and El-Hennawy, 2022*	23	Lourenço and El-Hennawy (2022)
	<i>Buthacus</i> Birula, 1908	<i>B. arenicola</i> (Simon, 1885)	13, 11, 21, 23, & 31	Vachon (1952); El-Hennawy (1992), Zourgui <i>et al.</i> (2008); Kaltsas <i>et al.</i> (2008); Aboshaala <i>et al.</i> (2022)
		<i>B. spatzi</i> (Birula, 1911)	18	(NHMC-UoC) 2007
		<i>B. foleyi</i> Vachon, 1948	20, 25	Vachon (1952); Kaltsas <i>et al.</i> (2008)
		<i>B. leptochelys</i> (Ehrenberg, 1829)	2, 5, 6, 11, 18, 25, 27 and 28	Vachon (1952) ; El-Hennawy (1992); Zourgui <i>et al.</i> (2008), Kaltsas <i>et al.</i> (2008)
		<i>Buthiscus</i> Birula, 1905	18 and 21	Rossi <i>et al.</i> (2013); Aboshaala <i>et al.</i> , (2022)
	<i>Buthus</i> Leach, 1815	<i>B. adrianae</i> Rossi <i>et al.</i> , 2013	21 and 28	Rossi <i>et al.</i> , (2013); Aboshaala <i>et al.</i> (2022)
		<i>B. chambiensis</i> Kovarik, 2006	27	Kovarik (2006); (NHMC) 2007
		<i>B. lourencoi</i> Rossi, Tropea and Yagmur, 2013	3 and 28	Rossi <i>et al.</i> (2013); Sousa <i>et al.</i> (2017)
		<i>B. barcaeus</i> Birula, 1909*	20	Vachon (1952); Fet <i>et al.</i> (2000); Sousa <i>et al.</i> (2017)
		<i>B. tunetanus</i> (Herbst, 1800)	1, 2, 5, 6, 20, 21, 28 and 31	Vachon (1952); El-Hennawy (1992); Sousa <i>et al.</i> (2017)
	<i>Cicileus</i> Vachon, (1948)	<i>C. latellai</i> Lourenço and Rossi, 2015	20	Lourenço and Rossi (2015)
		<i>Compsobuthus</i> Vachon, (1949)	1, 3 and 8	Vachon (1952); (El-Hennawy (1992); Kaltsas <i>et al.</i> (2008)
		<i>C. klapotczy</i> (Birula, 1909)*	2, 3, 4 and 13	Lourenço and Rossi (2015)
	<i>Hottentotta</i> Birula, 1908	<i>H. minax</i> (L. Koch, 1875)	5, 19 and 24	Kaltsas <i>et al.</i> (2008)
		<i>H. syrticus</i> (Borelli, 1914) *	9	Vachon (1952)
	<i>Leiurus</i> Ehrenberg, 1828	<i>Leiurus fezzanensis</i> Yağmur, Aboshaala, & Kovarik, 2025*	31	Yağmur <i>et al.</i> (2025a)
	<i>Lissothrus</i> Vachon, 1948	<i>L. bernardi</i> Vachon, 1948*	25 and 31	Vachon (1952); El-Hennawy, (1992); Fet <i>et al.</i> , 2000
	<i>Orthochirus</i> Karsch, 1891	<i>O. innesi</i> Simon, 1910	2, 9, 13, 18, 20, 23, 27, and 31	Vachon (1952); El-Hennawy (1992); Fet <i>et al.</i> (2000); Zourgui <i>et al.</i> (2008); Kaltsas <i>et al.</i> (2008)
Euscorpiidae Thorell, 1876.	<i>Euscorpius</i> Thorell, 1876	<i>E. sicanus</i> (C. L. Koch, 1837)	2 and 4	Vachon (1952); (NHMC-UoC) 2007
Scorpionidae Latreille, 1802	<i>Scorpio</i> Linnaeus, 1758.	<i>S. palmatus</i> (Ehrenberg, 1828)	4, 5, 8, 19, 21 and 28	Vachon (1952); El-Hennawy, (1992); Zourgui <i>et al.</i> (2008); Kaltsas <i>et al.</i> (2008)

*Endemic species, ** unidentified material

belonging to four families have been reported, with nine endemic species (Badry *et al.*, 2018; Kovařík *et al.*, 2020; Cain *et al.*, 2021; Lourenço & El-Hennawy, 2021; Badry *et al.*, 2023). For other countries neighboring Libya, such as Tunisia, Chad, and Niger, scorpion diversity has not yet been fully estimated, but it is certainly expected to be lower in species richness than that of Libya. Our results (28 species) are very similar to those of Egypt, are encouraging and promising, deserve increased sampling efforts and exploration of other regions that remain inaccessible.

The distribution pattern of scorpion species in Libya shows a great divergence. Of which, two species of the genus *Androctonus*: *A. amoreuxi* and *A. australis* are the most widespread (Cst), present in 75% of the collection localities, respectively. Four species are ranked moderately widespread (Cmt),

while nine species are very restricted (present in only one site). In our study, we note that no species corresponds to the Omnipresent category (Omn). The systematic list of Libyan scorpions and their occurrence frequency is detailed as follows (Table 2).

Regionally, scorpion diversity is high in the northwestern part of Libya, with the departments of Misurata and Tajura showing the highest species richness, each with eight species. The results of this study highlight a marked regional variation in scorpion diversity across Libya. In our study, four departments (An Nuqat al Khams, Az Zawlah, Bani Walid and Benghazi) did not record any scorpion species; however, this absence may not necessarily indicate a true lack of scorpion populations. Instead, it may reflect the influence of several limiting factors. Environmental conditions, such as extreme aridity, unsuitable soil composition, lack of

Table 2. Species list and occurrence frequency of scorpion species of Libya

Genera	Species	Occurrence	Scale
<i>Androctonus</i>	<i>A. aeneas</i>	15.63%	Accidental
	<i>A. longecarinatus</i>	18.75%	Accidental
	<i>A. amoreuxi amoreuxi</i>	75.00%	Constant
	<i>A. australis</i>	75.00%	Constant
	<i>Androctonus</i> sp.	3.13%	Very accidental
	<i>A. tibesti</i>	3.13%	Very accidental
<i>Buthacus</i>	<i>B. arenicola</i>	15.63%	Accidental
	<i>B. spatzi</i>	3.13%	Very accidental
	<i>B. foleyi</i>	6.25%	Very accidental
	<i>B. leptochelys</i>	25.00%	Common
<i>Buthiscus</i>	<i>B. bicalcaratus</i>	6.25%	Very accidental
<i>Buthus</i>	<i>B. adrianae</i>	6.25%	Very accidental
	<i>B. chambiensis</i>	3.13%	Very accidental
	<i>B. lourencoi</i>	6.25%	Very accidental
	<i>B. barcaeus</i>	3.13%	Very accidental
	<i>B. tunetanus</i>	25.00%	Common
	<i>B. orientalis</i>	3.13%	Very accidental
<i>Cicileus</i>	<i>C. latellai</i>	3.13%	Very accidental
<i>Compsobuthus</i>	<i>C. werneri</i>	9.38%	Very accidental
	<i>C. klaptoczi</i>	12.50%	Accidental
<i>Hottentotta</i>	<i>H. minax</i>	9.38%	Very accidental
	<i>H. syrticus</i>	3.13%	Very accidental
<i>Leiurus</i>	<i>L. fezzanensis</i>	3.13%	Very accidental
<i>Lissothus</i>	<i>L. bernardi</i>	6.25%	Very accidental
<i>Orthochirus</i>	<i>O. innesi</i>	25.00%	Common
<i>Euscorpis</i>	<i>E. sicanus</i>	6.25%	Very accidental
<i>Scorpio</i>	<i>S. palmatus</i>	18.75%	Accidental

vegetation cover, and significant anthropogenic disturbances may contribute to making these areas unsuitable for scorpion habitation. Furthermore, insufficient sampling efforts or limited accessibility to certain regions may have also resulted in an underrepresentation of species presence (Fig. 3).

Figure 2 clearly demonstrates that scorpion diversity is higher in the northwestern part of Libya, where more than five species occur (indicated by the orange, green, and brown colors). In contrast, the southern part of the country exhibits lower diversity, with fewer than four species (indicated by the pink color). This distribution pattern may be explained by the complex interplay of various ecological and environmental factors. Regional climatic parameters, including temperature range, humidity levels, and precipitation patterns, significantly influence scorpion survival and distribution (Sadine *et al.*, 2023). Furthermore, topographical variation in this region creates diverse microhabitats that support a wide

range of ecological niches for different scorpion species.

Hydrological features, such as proximity to wadis and the presence of groundwater, help maintain local moisture levels that are critical for scorpion activity (Polis, 1990; Yamaguti and Pinto-da-Rocha, 2006; Araújo *et al.*, 2010). Soil type and slope orientation also play essential roles in thermoregulation and burrowing behavior, directly affecting species persistence (Blasco-Aróstegui *et al.*, 2025). In addition, areas with dense or relatively stable vegetation provide better shelter, greater prey availability, and increased environmental stability, all of which contribute to higher scorpion diversity (Sadine *et al.*, 2012; Ouici *et al.*, 2020).

These findings underscore the importance of integrating multiple ecological parameters when interpreting species distribution patterns, as scorpion diversity is shaped by the combined effects of climate, topography, hydrology, soil characteristics, and vegetation. Moreover, insufficient sampling effort and

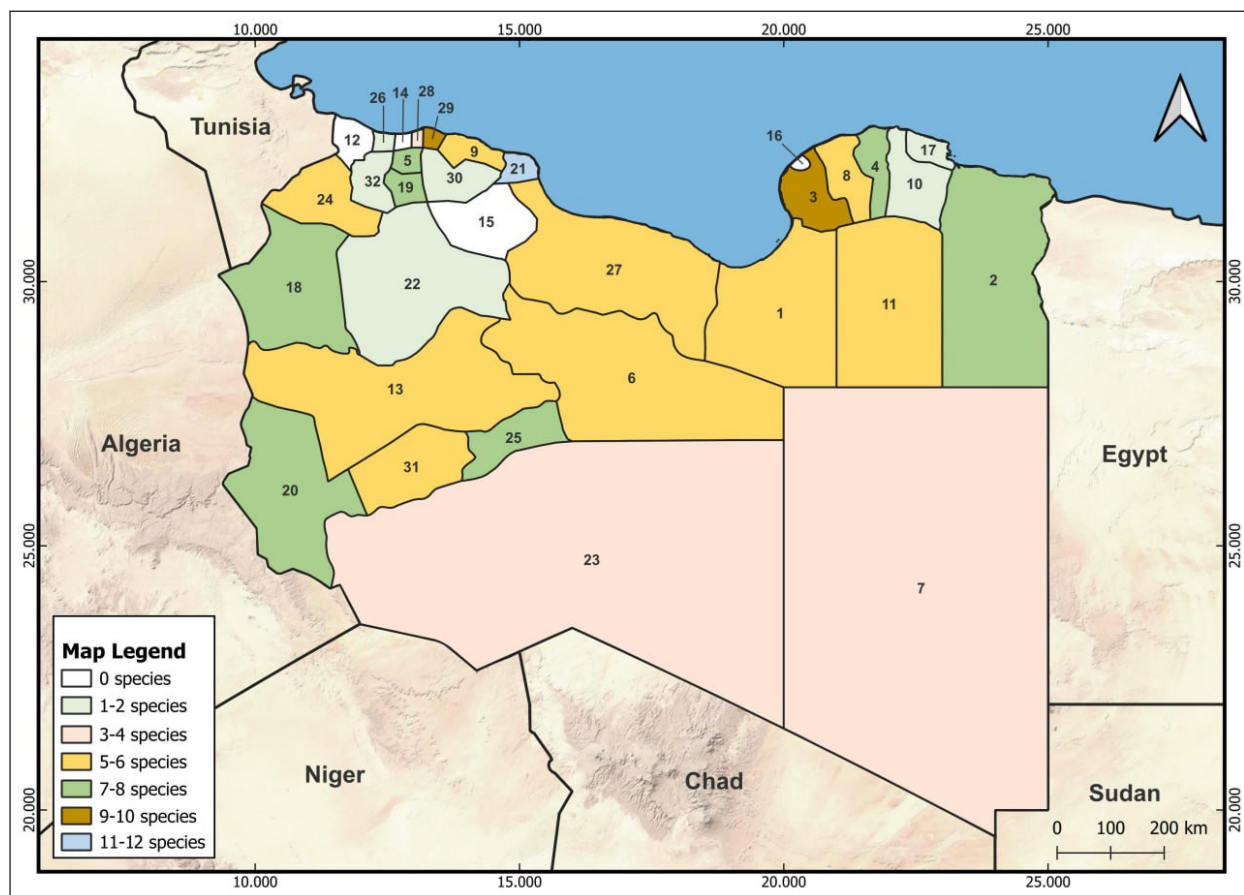


Fig. 2. Distribution of scorpion species according to departments.

limited accessibility to certain regions may have contributed to the underrepresentation of species occurrences. Therefore, further targeted field surveys are essential to verify these findings and to determine whether these regions are truly devoid of scorpions or simply remain underexplored.

Conclusions

The present study synthesizes all available literature and examines recently collected material to provide an updated checklist of the scorpion fauna of Libya. The revised inventory comprises 28 species, highlighting the considerable diversity of scorpions in the country and an endemism rate of 21.4%. Species distribution varies markedly among regions, with several taxa being rare or restricted to specific localities, whereas other regions exhibit relatively low species richness. Because the factors governing these distribution patterns remain poorly understood, further investigations encompassing the wide range of habitats present in this vast country are essential to improve our understanding of Libyan scorpion diversity.

Seasonal fluctuations in environmental conditions and food availability may influence the temporal distribution and abundance of scorpion populations. Therefore, future studies should focus on evaluating the effects of seasonal variation on the ecology, distribution, and population dynamics of scorpion communities.

One of the major findings of the present study is the exclusion of *Androctonus crassicauda* (Olivier, 1807), *Buthus occitanus* (Amoreux, 1789), and *Leiurus quinquestriatus* (Ehrenberg, 1828) from the scorpion fauna of Libya based on current systematic knowledge and zoogeographical evidence. In contrast, *Leiurus fezzanensis*, an endemic species restricted to Libya, deserves special attention because of its medical importance and restricted distribution.

Given the limited scope of previous investigations, particularly in remote and ecologically diverse regions, our knowledge of Libya's scorpion fauna remains incomplete. This underscores the urgent need for comprehensive field surveys covering a broad range of habitats, combined with modern taxonomic approaches such as molecular phylogenetics (COI barcoding) and phylogeographic analyses.

Such studies will help clarify the taxonomic status of uncertain populations, improve our understanding of species distributions and endemism patterns, and may lead to the discovery of previously undescribed species.

Strengthening national research programs and promoting international collaborations are essential for bridging existing knowledge gaps and developing a more comprehensive understanding of Libya's scorpion biodiversity. Particular attention should be given to understudied regions, including An Nuqat al Khams, Az Zawiyah, Bani Walid, and Benghazi, where additional surveys may reveal new distribution records and potentially new species. Furthermore, endemic and geographically restricted species should be prioritized in future conservation assessments to ensure the preservation of Libya's unique scorpion fauna.

Author Contributions

Conceptualization, F.A., S.E.S., M.G., I.S., A.B. and E.A.Y.; methodology, F.A., S.E.S., M.G., and I.S.; software, F.A. and S.E.S.; validation, F.A., S.E.S., I.S. and E.A.Y. formal analysis, F.A. and S.E.S.; data curation, F.A., Z.S. and I.S.; drafted the manuscript, F.A., S.E.S., M.G., I.S., A.B., Z.S. and E.A.Y. All authors have read and agreed to the published version of the manuscript

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Data Availability Statement

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

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Conflicts of Interest:

The authors declare no conflicts of interest.

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Zineb Souilem is a secondary school teacher since 2011 and recently completed her Ph.D. in Biodiversity and Environment (June 2026). Scientific research of Dr Souilem focused on scorpion diversity in arid ecosystems, particularly the ecology, taxonomy and biogeography of scorpions fauna of the Algerian Sahara. She is also interested in research on biological control and phytopathology.

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