Herpetofauna of Mauritania: results of a field survey

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Resumen: Se presentan observaciones de campo realizadas durante una expedición herpetológica llevada a cabo en Mauritania en el verano de 2022. Varias nuevas citas de 11 especies de anfibios y 33 especies de reptiles son indicadas, incluyendo la primera evidencia confirmada en Mauritania de una serpiente del género *Prosymna*.

Mauritania encompasses the biogeographic transition zone between the Palearctic and Afrotropical regions, bringing together a considerable high biodiversity, which comprises animal species of Saharan, Sahelian, Afrotropical and even Mediterranean origin (Padial, 2006; Brito *et al.*, 2014, 2016). Despite this, knowledge on the amphibians and reptiles of Mauritania is still scarce although in the last decades there has been an increase in ecological, taxonomic and biogeographic investigations, both in Mauritania (e.g. Crochet *et al.*, 2003; Padial *et al.*, 2013; Sánchez-Vialas *et al.*, 2017; Sow *et al.*, 2014, 2017; Naia & Brito, 2020; Sampaio *et al.*, 2021) and in other West African countries (e.g. Metallinou *et al.*, 2012; Brito *et al.*, 2016).

In this article, we report new observational records, mostly in the southern part of the country, which may help to expand the checklist of Mauritanian amphibians and reptiles and increase knowledge on their distribution, ecology and interactions with related species.

Observations were made by the authors during an expedition from July 23rd to August 2nd, 2022. This period corresponds to the beginning of the rainy season, during which heavy rains are typical and may provoke floods. Temperatures generally ranged from 21 to 35º C (www.meteobox.com). Observations were made in the regions Trarza, Brakna, Gorgol, Guidimaka, Assaba and Inchiri (for more information see Figure 1) at elevations comprised between 0 and 208 masl. In order to investigate the presence of species active at different times of the day, surveys were made in the daytime and during the first hours of the night. When possible, individuals were captured, photographed and released at the capture site after a short time. In some cases (e.g. crocodiles, agamids, monitors…), animals were photographed from a distance. No animals were sacrificed. Records are indicated with geographic coordinates (latitude and longitude with datum WGS 1984).

Based on the current taxonomy, a total of 11 species of amphibians and 33 species of reptiles were found during the expedition.

Amphibians

The heavy rains during some days of the trip facilitated the observation of amphibians, frequently in mating activity (males calling or moving to the reproduction areas and pairs in amplexus). Members of the family Bufonidae were observed practically on every day, with more than 100 individuals belonging to

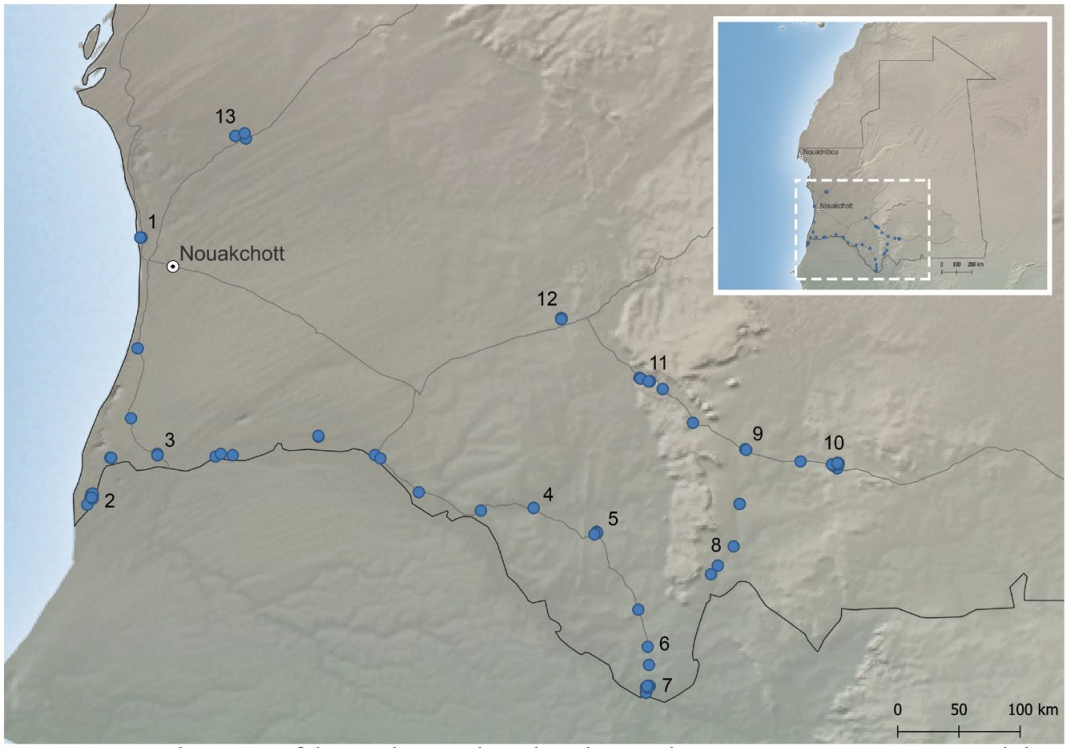

Figure 1: Map with itinerary of the expedition and numbers showing the main prospecting spots: 1. Nouakchott coastal area, 2. Diawling National Park, 3. El Haidi, 4. El Bir, 5. M´Bout, 6. Selibaby, 7. Guemou, 8. Kankossa, 9. Kiffa, 10. Metraoucha, 11. Guerou-Aflout, 12. Sangrave, 13. Ouad Naga-Akjoujt.
Figura 1: Mapa con el itinerario de la expedición y números mostrando los principales sitios de prospección: 1. Zona costera de Nouakchott, 2. Parque Nacional de Diawling, 3. El Haidi, 4. El Bir, 5. M´Bout, 6. Selibaby, 7. Guemou, 8. Kankossa, 9. Kiffa, 10. Metraoucha, 11. Guerou-Aflout, 12. Sangrave, 13. Ouad Naga-Akjoujt.

three different species spotted in the whole trip. Considering that southern Mauritania has a low annual rainfall, mostly concentrated in the rainy season (July-October; https://weatherspark.com/), it seems normal that the most common and widespread amphibians are toads, which are well adapted to arid environments (Bentley, 1966). Apart of the Bufonidae species and *Tomopterna milletihorsini*, the other species of amphibian were found strictly near *gueltas*, rivers and other water bodies.

Hoplobatrachus occipitalis (Günther, 1858)

Hoplobatrachus occipitalis was the most commonly observed amphibian. This species was particularly abundant in Diawling National Park (16.30ºN, -16.40ºW ; 16.30ºN, -16.39ºW). Other observations were made in water bodies in M´Bout (16.01ºN, -12.57ºW), Guemou (14.85ºN, -12.18ºW), Metraoucha (16.54ºN, -10.74ºW) and between Kiffa and Sangrave (17.18ºN, -12.24ºW). These populations belong to the two parapatric lineages identified in Mauritania, which present no obvious morphological differences (Gonçalves & Brito, 2020; Sampaio *et al.*, 2021).

Kassina senegalensis (Duméril & Bibron, 1841)

The Senegal running frog was found in several localities, based either on visual inspection or by listening to male calls: south of Gui-

dimaka (14.80ºN, -12.20ºW), Bougari and Trig el Khdheirat- Metraoucha area (16.52ºN, -10.78ºW; 16.53ºN, -10,76ºW; 16.54ºN, -10,75ºW), between Gerou and Sangrave (17.18ºN, -12.24ºW; 17.16ºN, -12.18ºW).

Phrynobatrachus francisci (Boulenger, 1912)

According to Sampaio *et al.* (2021), individuals of the genus *Phrynobatrachus* in Mauritania belong to the species *francisci* and have been wrongly attributed to *natalensis* because of morphological similarity. We found three individuals calling in a small lagoon with abundant riparian vegetation (16.30ºN, -16.39ºW). This is supposedly the first record of this species in Diawling National Park (see Sow *et al.*, 2017), expanding the distribution in Mauritania more than 200 km (Padial *et al.*, 2013; Naia & Brito, 2020; Sampaio *et al.*, 2021). In the same water body, we found a high abundance of adult individuals of *Hoplobatrachus occipitalis*, as well as fishes that were not identified.

Genus ***Ptychadena*** (Boulenger, 1917)

According to the species key of Sánchez-Vialas *et al.* (2017), we found two individuals belonging to two distinct species of *Ptychadena*. *Ptychadena trinodis* (Boettger, 1881), characterized by dorsal and lateral ridges, was observed in Guidimaka (14.80ºN, -12.20ºW), whereas *P. schillukorum* (Werner, 1908), that lacks dorsal and lateral ridges, was detected near El Bir (16.20ºN, -13.05ºW).

Pyxicephalus edulis (Peters, 1854)

One of the rarest amphibians in Mauritania, with only four records (Padial *et al.*, 2013; Sampaio *et al.*, 2021). We observed two individuals in Guidimaka (14.80ºN, -12.20ºW) in the edge of two small and probably temporary water ponds (Figure 2a).

Sclerophrys pentoni (Anderson, 1893)

According to Padial *et al.* (2013), the distribution of this species is restricted to south-eastern Mauritania. However, recent surveys combined with genetic analyses for species identification reported the presence of *S. pentoni* at several other locations also in the Guidimaka, Gorgol, Assaba and Tabant regions, as well as in Diawling National Park (see Table S1 in Sampaio *et al.*, 2021). Here we confirm and extend these observations, as we found *S. pentoni* in Assaba (16.23ºN, -11.49ºW), Hodh-Gharbi (16.52ºN, -10.78ºW; 16.53ºN, -10.76ºW; 16.54ºN, -10.75ºW) and Trarza (16.60ºN, -15.90ºW). Together, these findings suggest that the distribution of *S. pentoni* embraces most of the southern part of the country.

Sclerophys regularis (Reuss, 1833) and ***Sclerophrys xeros*** (Tandy, Tandy, Keith & Duff-Mackay, 1976)

Based on previous observations, *S. xeros* is widely distributed in Mauritania whereas *S. regularis* is restricted to Diawling National Park and another spot in extreme southwestern Mauritania (Padial *et al.*, 2013). Sampaio *et al.* (2021) added three records for *S. regularis* close to the Senegal River around Diafane and in Diawling National Park. According to Sow *et al.* (2017), both species are present in Diawling National Park, albeit in different localities.

The difficulties in differentiating the two species are due to the extreme color variability, which can result in erroneous identification of these toads. Therefore, we based species identification mainly on the calls made by the males. We could confirm the presence of *S. regularis* in El Bir (16.20ºN, -13.05ºW). Moreover, in Diawling National Park we found both species mating in the same locality, a water pond

among agriculture fields (16.29ºN, -16.40ºW). We tentatively assign to *S. xeros* individuals found in Tigomatin (16.88ºN, -16.10ºW), Kiffa (16.64ºN, -11.44ºW) and Trig el Khdheirat (16.52ºN, -10.78ºW), as these places are quite far from the Senegal river and its main tributaries and are supposed to be out of the known distribution range of *S. regularis*.

Tomopterna milletihorsini (Angel, 1922)

This species is widely distributed in the southern part of the country (Padial *et al.*, 2013; Naia & Brito, 2020; Sampaio *et al.*, 2021). We found it in the Assaba (16.23ºN, -11.49ºW) and Hodh-Gharbi regions (16.52ºN, -10.78ºW; 16.53ºN, -10.76ºW; 16.54ºN, -10.75ºW) and in two novel locations in Diawling National Park (16.27ºN, -16.40ºW; 16.30ºN, -16.40ºW). It is remarkable that this frog was found far from water sources.

Reptiles

The most frequently observed reptiles were, in the order, geckos (Gekkonidae: more than 20 individuals of four species, and Phyllodactyllidae: more than 100 individuals of three species), agamids (Agamidae: more than 50 individuals of five species), monitors (Varanidae: more than 30 records of three species) and vipers (Viperidae: 23 individuals of three species). All the geckos that we observed are mainly nocturnal species (Trape *et al.*, 2012; Martínez del Mármol *et al.*, 2019). Collectively, geckos were found in distinct habitats, including cities and villages, trees, rocky formations and even sandy areas with limited vegetation. Mauritania is home to different species of agamids, including pure-desert species such as *Uromastyx dispar* or *Trapelus boehmei*, and the very adaptable genus *Agama* (Trape *et al.*, 2012). Members of this genus seem to be adapted to live in different arid environments, as well as in cities and other human settlements. Monitors were found mainly close to water sources, except for *Varanus griseus* that is a pure desert species (Schleich *et al.*, 1996; Martínez del Mármol *et al.*, 2019). Regarding snakes, about 60% of the recorded individuals were vipers (23 out of 37 snakes in the whole trip). Vipers possess various adaptations, including ambush hunting, that is extremely useful in arid environments, where water availability is limited, and the density of preys is usually low (Tsairi & Bouskila, 2004).

Acanthodactylus dumerilii (Milne-Edwards, 1829)

Four populations of lizards of this genus were observed (17.41ºN, -16.05ºW; 18.25ºN, -16.03ºW; 19.04ºN, -15.24ºW; 16.74ºN, -14.68ºW). We tentatively identified them as *A. dumerilii*.

Genus ***Agama*** (Linnaeus, 1758)

The taxonomic status of the *Agama agama* populations of West Africa remains unclear. The attribution of these populations to *A. picticauda* (Peters, 1877) remains uncertain (Wagner *et al.*, 2009), given that some authors recently considered *A. picticauda* as a synonym of *A. agama* (Mediannikov *et al.*, 2012; Velo-Antón *et al.*, 2022). Based on the available data (Gonçalves *et al.*, 2012, 2018; Vale *et al.*, 2012), *A. boulengeri* and *A. boueti* are widely distributed in Mauritania, whereas *A. agama* has been recorded in one locality south of Kiffa (Trape *et al.*, 2012), another locality in Diawling National Park (Sow *et al.*, 2017) and five more sites in the Trarza, Guidimaka, Assaba and Hodh El Gharbi provinces (Velo-Antón *et al.*, 2022).

Figure 2: a) *Pyxicephalus edulis*, Guemou (*); b) *Agama boulengeri*, Selibaby (**); c) *Uromastyx dispar*, Ouad Naga (*); d) *Chalcides delislei*, Bougari (**); e) *Scincopus fasciatus*, El Haidi (**); f) *Prosymna g. collaris*, Guemou (**). (Photos: * G. Martínez del Mármol; ** A. Izagirre).

Figura 2: a) *Pyxicephalus edulis*, Guemou (*); b) *Agama boulengeri*, Selibaby (**); c) *Uromastyx dispar*, Ouad Naga (*); d) *Chalcides delislei*, Bougari (**); e) *Scincopus fasciatus*, El Haidi (**); f) *Prosymna g. collaris*, Guemou (**). (Fotos: * G. Martínez del Mármol; ** A. Izagirre).

We observed many individuals of *A. agama* close to the Senegal border from Diawling National Park in the West to Guidimaka province in the East (Figure 3 shows a map with records of the three species, including eleven new spots for *A. agama*). In Diawling National Park, *A. agama* and *A. boueti* were occasionally found in the same localities, but in different microhabitats: *A. agama* was present in human structures or in trees, whereas *A. boueti* was mainly observed in the ground close to bushes. In contrast with Velo-Antón *et al.* (2022), in the Sahelian regions farther from the Senegal river, we observed only *A. bou-*

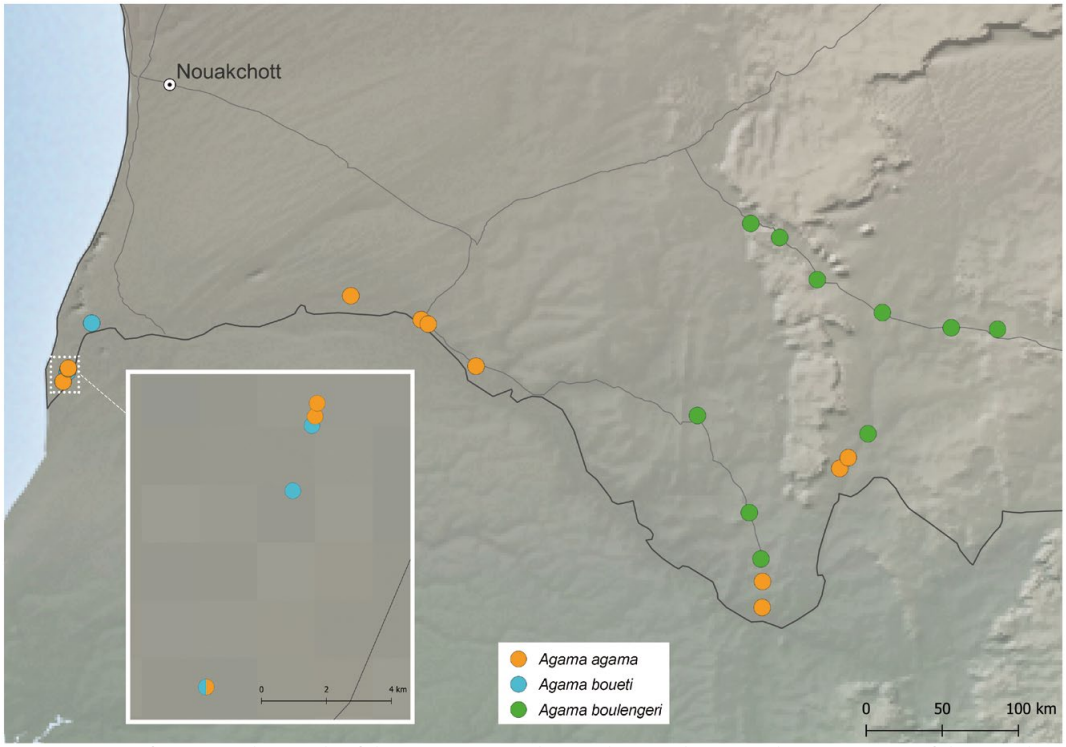

Figure 3: Specific map with records of the genus Agama during the expedition, with an extension of the Diawling National Park.
Figura 3: Mapa específico con las citas del género Agama durante la expedición, con una ampliación del Parque Nacional de Diawling.

lengeri, occupying distinct kind of habitats. This species was especially common around human structures and in rocky areas.

In the city of Selibaby, a contact zone of *A. agama* and *A. boulengeri*, we observed two male individuals seemingly belonging to *A. boulengeri* but with an unusually large dorsal crest, as observed in some males of *A. agama* (Figure 2b). This raises the possibility that hybrids of the two species occur at this contact zone.

Trapelus boehmei (Wagner, Melville, Wilms & Schmitz, 2011)

An adult male was observed basking on the top of a pile of rocks in Inchiri (19.02ºN, -15.31ºW), at 12:45 h.

Uromastyx dispar flavifasciata (Mertens, 1962)

This species typical of the Sahara desert penetrates into the Sahel ecoregion in southern Mauritania (Trape *et al.*, 2012; Velo-Antón *et al.*, 2022). We recorded the species at two distinct localities. The first is a group of isolated rocks between sand dunes in the north of Sangrave (17.64ºN, -12.84ºW). A subadult with brown color and two adults of the morphotype obscura (black color with white-yellow dorsal stripes) were found basking in the morning at 10.00-10:30 h. These three individuals found refuge under large stones. The other site was at 120 km northeast of Nouakchott (19.02ºN, -15.31ºW). Two adults were basking in the middle of the day (13:00 h).

They both had a yellowish background color with dorsal ocelli marks (morph "*ocellata*" fide Trape *et al.*, 2012, but with yellowish and not grey color). These lizards escaped in ground burrows (one located under a small stone, and the other opening directly on bare ground). According to the locals, the large majority of individuals present in that region are yellowish, and do not show the typical black color (Figure 2c).

Hemidactylus angulatus (Hallowell, 1854)

Several individuals were found around houses in Diawling National Park (16.30ºN, -16.40ºW).

Ptyodactylus rivapadiali (Trape, 2017)

Two adult individuals were found near a *guelta* at 6 km west of Aouinet Nanaga (17.18ºN, -12.24ºW).

Genus ***Stenodactylus*** (Fitzinger, 1826)

Both *Stenodactylus petrii* (Anderson 1896) and *Stenodactylus sthenodactylus* (Lichtenstein, 1823) are widespread in Mauritania (Metallinou *et al.*, 2012; Velo-Antón *et al.*, 2022). These two species are differentiated by the base of the tail, which is wider in *S. stenodactylus* compared to *S. petrii* (Martínez del Mármol *et al.*, 2019; León Vigara, 2020). The species that we most frequently observed was *S. petrii*. Records were made in the coastal area (18.25ºN, -16.02ºW), and also inland in southernmost Inchiri (19.00ºN, -15.23ºW). In those localities, we could confirm that *S. petrii* shares the habitat with *S. sthenodactylus*. We made additional observations of *S. petrii* in the surroundings of El Haidi (16.60ºN, -15.90ºW) and in the north of Sangrave (17.64ºN, -12.84ºW), both sandy areas with disperse bushes.

Genus ***Tarentola*** (Gray, 1825)

This genus is widely distributed in the Sahara Desert (Böhme *et al.*, 2001; Trape *et al.*, 2012; Martínez del Mármol *et al.*, 2019). We observed two species of the "*Tarentola ephippiata* complex" fide Koppetsch & Böhme (2022): *Tarentola senegambiae* (Joger, 1984) was found in two distinct spots in the southwestern part of the country (16.88ºN, -16.10ºW; 16.30ºN, -16.39ºW), whereas *Tarentola hoggarensis* (Werner, 1937) was observed south of Kiffa (16.23ºN, -11.49ºW).

Whereas geckos belonging to the "*Tarentola ephippiata* complex" are usually found in trees, the other species that we observed in Mauritania were observed in trees but also mainly in buildings and other human structures, as well as on rocky surfaces and even on sandy soil at night. *Tarentola annularis* (Geoffroy Saint-Hilaire, 1827) was found north of Nouakchott (19.00ºN, -15.23ºW) and along the coastal road south of the capital (17.41ºN, -16.05ºW). *Tarentola parvicarinata* (Joger, 1980) was found inland in several localities (16.01ºN, -12.57ºW; 14.85ºN, -12.17ºW; 16.23ºN, -11.49ºW; 16.54ºN, -10.74ºW; 17.16ºN, -12.17ºW; 17.63ºN, -12.84ºW). Many individuals (probably more than 50) were observed one evening near a *guelta* in the proximity of Aouinet Nanaga (17.18ºN, -12.24ºW). *Tarentola annularis* and *T. parvicarinata* have a similar ecology so probably they have parapatric distributions to avoid competition for resources.

Tropiocolotes tripolitanus occidentalis (Parker, 1942)

Tropiocolotes tripolitanus has a wide distribution and the Mauritanian populations belong to the subspecies *T. t. occidentalis* (Machado *et al.*, 2021; Uetz *et al.*, 2022). We observed indi-

viduals of this species in El Haidi (16.60ºN, -15.90ºW), around Kaedi (16.18ºN, -13.45ºW), near Kiffa (16.64ºN, -11.44ºW) and in Bougari (16.53ºN, -10.79ºW).

Genus ***Chalcides*** (Laurenti, 1768)

We found *Chalcides sphenopsiformis* (Duméril, 1856) in Nouakchott (18.25ºN, -16.03ºW) and in Diawling National Park (16.30ºN, -16.40ºW). These observations fall within the known range for the species. Two adults and a juvenile of *Chalcides delislei* (Lataste & Tochebrune, 1876) were found near the Bougari lagoon (16.53ºN, -10.79ºW) (Figure 2d). This is the second observation for the Sahelian range of Mauritania (see Velo-Antón *et al.*, 2022), which suggests that there could be a continuous distribution of populations of Senegal, Mali and Atar in northern Mauritania.

Scincopus fasciatus (Peters, 1864) and ***Scincus albifasciatus*** Boulenger, 1890

The area compromised between El Haidi and Lahouvich has the majority of records for *Scincopus fasciatus* in Mauritania, with three encounters (Vicent-Castelló *et al.*, 2018). In El Haidi (16.60ºN, -15.90ºW), we found two adult individuals just after sunset and then one more about two hours later (Figure 2e). These skinks were active in a sandy area with spiny bushes and dispersed trees. In the same area, we observed one individual of *Scincus albifasciatus* (Boulenger, 1890); this record is of particular interest as this is the first inland observation for the southernmost part of Mauritania (Trape *et al.*, 2012). Moreover, together with Taouz in Morocco (Martínez del Mármol *et al.*, 2019), this is one of the few localities in which *Scincopus fasciatus* and *Scincus albifasciatus* could be sympatric.

Another specimen of *Scincus albifasciatus* was found dead inside a human structure to retain water (17.41ºN, -16.05ºW).

Trachylepis perrotetii (Duméril & Bibron, 1839)

Two individuals were found under a piece of wood near Guemou, in southern Guidimaka (14.84ºN, -12.18ºW). One was clearly a male with a bright orange color in the sides of the body. The other individual, smaller and with a brown pattern, was probably a female, although we cannot exclude that it could belong to *Trachylepis quinquetaeniata* (Lichtenstein, 1823), which also has been recorded in Guidimaka (Velo-Antón *et al.*, 2022).

Genus ***Varanus*** (Merrem, 1820)

Many individuals of *Varanus niloticus* (Linnaeus, 1766) were recorded during the trip. Sightings were particularly common near water bodies in Diawling National Park and the surroundings, from Keur-Macene to the border with Senegal. An individual was found dead on the road East of Rosso (16.59ºN, -15.46ºW). A large individual was found in a river near Guemou, in southern Guidimaka (14.84ºN, -12.18ºW) and many individuals of different sizes (adults and juveniles) were found in the Metraoucha *guelta* (16.54ºN, -10.75ºW; 16.53ºN, -10.74ºW). One juvenile was resting at night in a tree at two meters above ground level, probably to avoid predators.

Six individuals of *Varanus exanthematicus* (Bosc, 1792) were recorded. A young savannah monitor was found crossing the road (16.61ºN, -15.42ºW) with the mouth full of recently ingested preys (earwigs of the order Dermaptera). The other individuals, all adult, were spotted in Diawling National Park (16.30ºN, -16.40ºW; 16.30ºN, -16.39ºW) and the surroundings (16.58ºN, -16.25ºW).

In Diawling National Park (16.30ºN, -16.40ºW; 16.30ºN, -16.39ºW) both species of monitor were found in the same habitat near houses and other human structures. Nile monitors (adults and hatchlings) were seen moving over 300 meters to reach water bodies, in places where Savannah monitors were also present. However, we never observed interactions between individuals of the two species.

Tracks of *Varanus griseus* (Daudin, 1803) were observed in Inchiri (19.04ºN, -15.24ºW).

Eryx muelleri (Boulenger, 1892)

An adult sand boa in the process of skin shedding was found under a big stone 20 km west of Kamour (17.16ºN, -12.17ºW). Rather than a sandy region, the habitat was a flat steppe with dispersed trees.

Python sebae (Gmelin, 1788)

An adult python with a total length of 2.35 meters was found in Diawling National Park (16.30ºN, -16.39ºW). This individual was crossing the main road along a lagoon at night.

Lytorhynchus diadema (Duméril, Bibron & Duméril, 1854)

Three individuals were found active in the first hours of the night in coastal dune habitat north of Nouakchott (18.25ºN, -16.03ºW). They all had a small size (approximately 40 cm in total length) and "pale" appearance.

Boaedon fuliginosus (Boie, 1827)

A juvenile was found at night resting 30 cm on a tree trunk, hidden under a T-shirt, in Diawling National Park (16.30ºN, -16.40ºW). To our knowledge, this is the fifth record of this species in the National Park (Sow *et al.*, 2017; Velo-Antón *et al.*, 2022).

Prosymna greigerti collaris (Sternfeld, 1908)

So far, the presence of snakes of the *Prosymna* genus in Mauritania has been dubious. *Prosymna meleagris* (Reinhardt, 1843) was recorded by Welch (1982). However, the record had no locality nor additional data and was not considered in later publications (Trape & Mané, 2006; Uetz *et al.*, 2022). We found one individual of *Prosymna greigerti collaris* in the southern part of Guidimaka (14.85ºN, -12.19ºW). The snake was found active at 22:00 h, moving slowly on the ground. It was characterized by a dark color, visibly iridescent under light, with tiny white spots on each dorsal scale. Two U-shaped white markings, typical for this subspecies, were present on the head and neck, bordering the parietal scales, followed more caudally by a white crossband forming an incomplete collar (Figure 2f).

According to Chirio *et al.* (2011), *P. g. collaris* has a mixed distribution, being present both in the Sahel and Sudanese savanna, whereas the other subspecies *P. g. greigerti* has a pure Sudanese savanna range. Both subspecies have been found in sympatry in some areas, but no hybrids have been found, which has led to the proposal that *P. g. collaris* should be raised to species status (J-F. Trape, personal communication.; Trape & Mané 2017; Trape *et al.*, 2020).

Genus ***Psammophis*** (Boié in Fitzinger, 1826)

We found six individuals of snakes belonging to this genus. A juvenile *Psammophis schokari* (Forskål, 1775), was found between Nouakchott and Diawling National Park (17.41ºN, -16.05ºW). This snake was active in the late morning in sandy habitat with scattered bushes and trees. Several lizards (*Acanthodactylus* sp.) were also observed in the area.

The other individuals were specimens of the recently described *Psammophis afroccidentalis* Trape, Böhme & Mediannikov, 2019. Three individuals were found in Diawling National Park: two adults escaped in spiny bushes (16.29ºN, -16.40ºW; 16.27ºN, -16.39ºW), whereas one juvenile was captured and photographed (16.30ºN, -16.39ºW). All these sand snakes had a striped pattern. Another adult sand snake was found dead on the road near Tekane (16.60ºN, -15.33ºW). Finally, a large *P. afroccidentalis* was found at night on the branches of a dense bush at about one meter from the ground at the edge of a flooded area (17.16ºN, -12.18ºW). These two latter individuals had no dorsal pattern.

***Naja* sp.** Laurenti, 1768

A shed skin of a big snake was found near buildings in Diawling National Park (16.30ºN, -16.40ºW). The head part was missing, however based on the large size (probably a snake of around 2 meters) and expert opinion (W. Wüster, personal communication), we estimate that the shed can be attributed to a big cobra (*Naja* sp.). Sow *et al.* (2017) found a cobra that was reported as *Naja nigricollis* (Reinhardt, 1843) at less than 200 meters from the same spot. Further genetic analysis on the shed skin of the cobra reported in Diawling by Sow *et al.* (2017) revealed, however, that the species was indeed *Naja senegalensis* Trape, Chirio & Wüster, 2009 (Velo-Antón *et al.*, 2022), a phylogenetically sister species to *Naja haje* that was not previously reported in the country (Trape & Mané, 2006; Trape *et al.*, 2009).

It is important to clarify which of the records historically assigned to *Naja nigricollis* in Mauritania are in fact *Naja senegalensis*. The defensive behavior of *N. nigricollis*, that is a venom spitting cobra (Kazandjian *et al.*, 2021), should help in the identification of this species at least in alive individuals.

Bitis arietans (Merrem, 1820)

The presence of the puff adder in Diawling National Park was suggested by some authors (Sow *et al.*, 2017; Nickel, 2003). Photographs taken by rangers of the National Park also indicated that the species is present in Diawling (F. Martínez-Freiría, personal communication). We found four individuals in two different habitats in the National Park. Two subadults were found at night at the edge of lagoons close to the entrance of the park (16.30ºN, -16.39ºW; 16.31ºN, -16.39ºW). Two adults, male and female, were found in savanna habitat near a forest; the female was found hidden inside a bush during the day whereas the male was found at night ambushing in another bush (both in 16.28ºN, -16.40ºW).

Cerastes cerastes (Linnaeus, 1758)

We found three adult individuals in a coastal area north of Nouakchott (18.25ºN-16.03ºW). The vipers were found moving or in ambush position during the night hours.

Echis leucogaster (Roman, 1972)

The taxonomic status of the *Echis pyramidum* group is still unclear. Molecular analyses showed a low genetic distance between the *leucogaster* clade, that includes samples of Tunisian individuals morphologically assigned to *Echis pyramidum* as well as samples from Mauritania, Morocco, Senegal, Mali and Niger, and the *pyramidum* clade, that include samples from Egypt, Kenya and Sudan (Pook *et al.*, 2009). Moreover, no morphological differences

are obvious in populations of the *leucogaster* clade and some of the populations of the *pyramidum* clade (T. Mazuch, personal communication). In conformity with recent publications (Chippaux & Jackson, 2019; Spawls & Branch, 2020; Velo-Antón *et al.*, 2022), we refer the individuals found in Mauritania as *E. leucogaster*, waiting for a more comprehensive taxonomic characterization of the *Echis pyramidum* species complex.

Echis leucogaster was the snake most frequently observed during the expedition, with up to 15 records in six areas (16.60ºN, -15.90ºW; 16.20ºN, -13.05ºW; 16.00ºN, -12.59ºW; 16.54ºN, -10.75ºW; 14.80ºN, -12.20ºW; 14.85ºN, -12.19ºW). These snakes were in very different habitats (comprising Sahelian Acacia savanna, sandy areas and riparian environments), showing a great adaptability in habitat preference for the species. Notably, no individuals were found in Diawling National Park (Sow *et al.*, 2017). This is surprising, considering that *E. leucogaster* is one of the commonest snakes in Southern Mauritania and Northern Senegal (Trape *et al.*, 2006; personal observation).

In Guemou (southern Guidimaka), some villagers commented about the real problem of snakes entering in houses, clearly recognizing in photographs *E. leucogaster* as the most common snake in the area. Six adult individuals were found in two hours in the surroundings of the village, suggesting that this snake could be particularly abundant. Although these vipers were generally calm (none of them tried to bite the authors when captured and during manipulation), they can bite fast if they feel threatened, so accidents must happen considering that local people, including those that work in agriculture fields, normally do not wear shoes.

Crocodylus suchus (Geoffroy Saint-Hilaire, 1807)

Relict populations of the West African crocodile have been rediscovered in Mauritania at the end of the last century (Shine *et al.*, 2001). Since then, several scientific expeditions have increased knowledge on the distribution and population size of this emblematic species (Brito *et al.*, 2011; Campos *et al.*, 2016).

We observed a few individuals in Diawling National Park, including a young adult that was found at night in a small water puddle with abundant riparian vegetation (16.30ºN, -16.39ºW). As indicated in Sow *et al.* (2017), the seasonal variation in the number of crocodiles is likely associated to the dynamics of water availability and that would explain the low amount of crocodiles found during our expedition.

In the Metraoucha *guelta* and the emissary stream (from point 16.53ºN, -10.74ºW to point 16.54ºN, -10.74ºW), we observed several individuals (approx. 20) of different sizes, from large adults (over 2 meters) to hatchlings. Interestingly, a similar number of crocodiles has been reported in the same locality by Brito *et al.* (2011). Adult crocodiles had an elusive behavior and entered into water whenever we approached the *guelta*.

Local people told us that *Crocodylus suchus* can be found in a *guelta* located near Aouinet Nanaga (17.18ºN, -12.24ºW), however we did not observe any crocodile nor their tracks.

Mauritania is a large nation, mostly occupied by desert. However, the southern part of the country contains various ecosystems, including dry savanna, coastal areas, mountains and wetland environments, which justifies its global importance for biodiversity conservation (Brito *et al.*, 2014; Vale *et al.*, 2015; Brito *et al.*, 2016; Sow *et al.*,

2017). In recent years, field investigations have greatly increased knowledge of the herpetofauna of Mauritania, resulting in the most updated taxonomic lists of amphibians and reptiles present in the country (Sow *et al.*, 2014, 2017: Naia & Brito, 2020; and references therein). However, future work is needed to continue improving knowledge of the herpetofauna of this country and begin effective conservation measures as proposed by Brito *et al.*, (2016). Indeed, the hotspots for Mauritania herpetofauna, such as the *gueltas*, have high biodiversity value and their protection is needed.

In this article, we have reported recent observations that will help to fulfil the knowledge gap in the species of amphibians and reptiles of Mauritania and their distribution. In particular, we have provided the first documented observation for the presence of *Prosymna greigerti* in the country, and we have expanded the known distribution of several other species by adding new localities to their distribution ranges. We concentrated our fieldwork predominantly in the southernmost part of Mauritania, an area characterized by the transition between the Sahel to the Sudanese savanna ecosystems, which exhibits a high diversity of both amphibians and reptiles (Sow *et al.*, 2017; Sampaio *et al.*, 2021; Velo-Antón *et al.*, 2022). Unfortunately, our field trip was partly limited by the strong rains that left some areas inaccessible. We expect that further fieldwork campaigns, especially in the Guidimaka region, may reveal the presence of other species recorded in north Senegal or Mali, such as *Elapsoidea trapei* (Mané, 1999), *Causus maculatus* (Hallowell, 1842), *Naja katiensis* (Angel, 1922), *Echis jogeri* (Cherlin, 1990) and *Phrynomantis microps* (Peters, 1875).

Some of the species recorded in the present article (*Scincus albifasciatus*, *Varanus niloticus*, *Sclerophrys* sp., *Kassina senegalensis*, *Hoplobatrachus occipitalis*) were found trapped inside wells or similar structures built to collect water, especially in Diawling National Park. The presence of water cisterns in arid regions has a major impact on the herpetofauna, as well documented in Morocco (Pleguezuelos *et al.*, 2017; Martínez del Mármol *et al.*, 2019). Thus, environmental education for the Mauritania institutions would be essential to avoid the proliferation of these structures or for taking effective measures to avoid the entrapping of animals. The presence of large numbers of dead animals in water cisterns is a problem not only for the ecosystems but also for people, because of the quality of the water.

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