



# A tentative list of reptilian fauna of Algeria and their conservation status

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## Abstract

### Background

Algeria is situated at the crossroads between Europe and Africa. The northern part of the country is listed as an area of high biodiversity. Currently, the ecosystems (rivers, lakes, deserts, forests etc.) and the species are under more pressure than ever. The impact of humans is significant and many factors constitute a strong threat to this fauna, especially reptiles, which are the most vulnerable because of their low mobility. Thus, pollution, the drying up of wetlands and their conversion to agriculture have clearly affected the existence of many species. The herpetofauna of Algeria is one of the most diversified in the Mediterranean Basin, consisting of 104 species of which 16.98% are endemic. We suppose that the present list of reptilian fauna provided in this paper is not exhaustive and it is expected to include more species given the lack of research on reptiles in Algeria and its large area.

## New information

Our dataset contains information on reptile occurrences in Algeria. The dataset is based on original research by the staff of the Laboratory of Environmental Sciences and Agroecology of Chadli Bendjedid University in Algeria. The conservation status of all recorded species is given.

## Keywords

checklist, reptiles, conservation, Algeria, *Chelonia*, Sauria, Ophidia

## Introduction

The documentation of herpetofauna of Algeria began a century and a half ago with the publication of the first notes by Gervais (1835), Gervais (1836) and Lataste (1880). The most important contribution in this period is from Boulenger (1891), who published a catalogue on the reptiles and amphibians of the "Barbarie", based chiefly upon the notes and collections made between 1880 and 1884 by M. Fernand Lataste. The document contains the identification keys of 62 species of reptiles listed with a precise description of every species and its distribution, but does not cover the entire geographical extent of Algeria. Later, Olivier (1894) published his document entitled "Herpétologie algérienne" or a catalogue of the reptiles and batrachians observed in Algeria. Doumergue (1901) published an essay on the herpetological fauna of Oranie with analytical tables and notes for the determination of all reptiles and batrachians of Morocco, Algeria and Tunisia. This work contains dichotomous tables that are very useful for the determination of the species. Beyond this period, the only published works, namely, the works of Gauthier (1965), Gauthier (1967), Grenot and Vernet (1972) and Grenot and Vernet (1973) were concerned mainly with Saharan herpetofauna. Currently, research on Algerian herpetological fauna is regaining interest with the appearance of many publications on the biology and ecology of some species (Benounnas 2021, Bezaz 2021, Mouane 2021, Rouag et al. 2016, Bouam et al. 2016, Mamou et al. 2016, Dellaoui et al. 2015, Rouag et al. 2007, Rouag et al. 2006, Rouag and Benyacoub 2006, Chirio and Blanc 1997, Chirio 1995, Laurent 1990). Additionally, taxonomic revision, based on molecular or morphological analyses recorded in Algeria and the Maghreb, has been the object of several publications in the last few years, in order to trace the biogeographic history of the Mediterranean herpetofauna (Beddek et al. 2018, Merabet et al. 2016, Tamar et al. 2016, Kapli et al. 2014, Stuckas et al. 2014, Anadón et al. 2012, Geniez et al. 2011, Fritz et al. 2009, Geniez et al. 2004, Geniez and Foucart 1995, Busack and McCoy 1990).

Situated in North Africa, Algeria comprises 2,381,740 km<sup>2</sup> of land, more than 80% of which is desert. Algeria's climatic regions and landscapes can be divided into four sections that run parallel to each other down the length of the country. The northernmost division, the Tell, is a coastal chain of mountains that extends from the northwest to the northeast over a

distance of 1500 km. This chain contains the most important mountains (Ouarsenis, Atlas Blidéen, Djurdjura, Babors and Kroumerie). The altitudes of some summits are over two thousand metres (2308 m for Djurdjura). The diversity of relief and exposure allows the presence of a wide variety of bioclimates ranging from semi-arid in the highlands to humid in the coastal mountainous chains, always characterised by mild and humid winters and hot and dry summers (Daget 1977). The mountain range becomes High Plateaus, a massive area of mostly barren plains. The next landscape band is made up of further mountain ranges that are part of Algeria's Saharan Atlas range, which is also the largest section. Certain sections of the Sahara Desert may not receive rain for periods of up to 20 years and the temperatures can exceed 55°C. Rainfall in the northern areas of Algeria measures approximately 1000 mm annually.

The extensive size of Algeria, coupled with uncharted regions, challenging accessibility and a scarcity of field herpetologists, contribute to the limited availability of information on reptiles in the country. The aim of this study is to summarise all possible sources of occurrence records for reptiles in Algeria, including our data, published literature records, verified reports on social networks and records published in online databases.

## Materials and methods

The present checklist is based on the available taxonomic and faunistic literature concerning the Algerian and North African herpetofaunas (Gherbi et al. 2023, Noura et al. 2022, Bouazza et al. 2021, Martínez-Freiria et al. 2021, Mouane 2021, Thomson 2021, Geniez et al. 2000, Fritz and Schmidtler 2020, Beddek et al. 2018, Kindler et al. 2017, Martínez-Freiria et al. 2017, Rato et al. 2016, Metallinou et al. 2015, Geniez 2015, Wagner et al. 2011, Fonseca et al. 2009, Wilms et al. 2009, Carretero 2008, Crochet et al. 2008, Rouag and Benyacoub 2006, Carranza et al. 2004, Bons and Geniez 1996, Schleich et al. 1996, Noura 1995, Chirio 1995, Chirio and Blanc 1993, Nilson and Andrén 1988, Noura and Blanc 1986). We also mainly used the checklists, the reports on the herpetofauna of the Mediterranean Basin and the field guides of the Reptiles for other regions of the Western Palearctic (Rhodin 2021, Trape et al. 2012, Cox et al. 2006, Trape and Mané 2006, Bons and Geniez 1996, Noura and Blanc 1993, Gruber 1992, Mebs 1991, Blanc 1980, Bischoff 1981, Bons 1967, Guibé 1950). We collected reptilian species occurrence records through direct field observations, especially in the north-east of Algeria. A review of scientific literature published on the herpetofauna in different regions of Algeria was used to establish the list of reptiles. We used online databases, such as Inaturalist; the Global Biodiversity Information Facility (GBIF 2023); the Reptile Database (Uetz 2021) and also the IUCN Red List (IUCN 2023). Additionally, we used personal observations of the experts, unpublished reports and consultation with specialised groups on biodiversity and wildlife in Algeria. In all, 104 species were identified.

## Geographic coverage

**Description:** Our database included all reptile species present in Algeria.

**Coordinates:** 28.033886 N; 1.659626 E.

## Quality control

The aim of this work is to provide a checklist of Algerian reptiles, based on all studies published by researchers to date. The species were identified by comparison with the bibliography and with material from collections previously identified by specialists. All assessments were made at the taxonomic level of the species. We based our analysis on the lists of Scleich et al. (1996) and Beddek (2017) and a combination with data available on databases, such as the Reptile Database (Uetz 2021), the IUCN Red List (IUCN 2023), as well as the Inaturalist platforms and Global Biodiversity Information Facility (GBIF) where species identification has been confirmed by renowned specialists. We also consulted the websites of the Muséum d'histoire naturelle de Paris (MNHN) and the Musuem of Vertebrate Zoology (California Academy of Science). Recently-cited species were only added if they appeared in publications in specialised and indexed journals. Recent studies in molecular biology allowing the description of new species were also used to update the checklist.

## Temporal coverage

**Data range:** 1835-1-01 - 2024-1-03.

## Taxonomic coverage

Reptiles constitute a major component of vertebrates in Algeria, as is the case in all hot and arid countries. This class includes 104 species belonging to four orders of reptiles: Amphisbaenia (amphisbaenians); Ophidia (snakes); Sauria (lizards); and *Chelonia* (turtles and tortoises). However, the majority of species are lizards (67.62%) and snakes (25.71%) (Table 1). The most important reptile families in the region are Lacertidae (24 species), Gekkonidae (Geckos: 18 species), Scincidae (Skinks: 15 species) and Colubridae (Colubridae: 12 species).

The desert crocodile species *Crocodylus suchus* (Geoffroy Saint-Hilaire, 1807), which once inhabited the Algerian Sahara, is now considered extinct. This species ceased to exist in the Immidir and Ahaggar Regions of Algeria since the early 20<sup>th</sup> century, as noted by Lescure (2014).

Table 1

Table 1.

Diversity in reptile orders and families within Algeria.

Orders	Suborders	Families	Species
Testudines	Cryptodira	5	6
Squamata	Sauria	11	71
	Serpentes	8	27
<b>Total</b>		<b>24</b>	<b>104</b>

## Checklist of Reptiles of Algeria

### *Mauremys leprosa* (Schweigger, 1812)

**Conservation status:** VU

**Distribution:** The north of the country up to the limit of the Saharan Atlas (El Kala, Oum El Bouaghi, Alger, Oran, Laghouat).

**Notes:** Bezaz (2021); Bakhouche et al. (2019); Rouag and Benyacoub (2006); Schleich et al. (1996); Doumergue (1901).

### *Emys orbicularis* (Linnaeus, 1758)

**Conservation status:** NT

**Distribution:** Coastal strip in the east of the country (El Kala, Annaba, Jijel, Skikda, Béjaia).

**Notes:** Gherbi et al. (2023); Rouag and Benyacoub (2006); Samraoui and de Belair (1997)

### *Testudo graeca* Linnaeus, 1758

**Conservation status:** VU

**Distribution:** The north of the country up to the limit of the Saharan Atlas.

**Notes:** Gherbi et al. (2023); Bezaz (2021); Rouag and Benyacoub (2006); ; Schleich et al. (1996)

### *Caretta caretta* (Linnaeus, 1758)

**Conservation status:** VU

**Distribution:** Along the Algerian coast (Algiers, Skikda, Jijel, El Tarf, Mostghanem, Oran).

**Notes:** Bennounas and Bennounas (2020); Belmahi et al. (2020); Laurent (1990); Lallemand (1867).

### ***Chelonia mydas* (Linnaeus, 1758)**

**Conservation status:** EN

**Distribution:** Rarest species (Ain Temouchent).

**Notes:** Bennounas and Bennounas (2020); Belmahi et al. (2020).

### ***Dermochelys coriacea* (Vandelli, 1761)**

**Conservation status:** VU

**Distribution:** Along the Algerian coast (Algiers, Skikda, Béjaia, Jijel, Boumerdes, Oran, Ain Temouchent).

**Notes:** Bennounas and Bennounas (2020); Belmahi et al. (2020).

### ***Tarentola mauritanica* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** The north of the country up to the limit of the Saharan Atlas (Oran, Aïn sefra, Mechria, El Kala, Annaba).

**Notes:** Benelkadi et al. (2021); Rouag and Benyacoub (2006); Doumergue (1901).

### ***Tarentola deserti* Boulenger, 1891**

**Conservation status:** LC

**Distribution:** the Saharan Atlas and the High Plateaus.

**Notes:** Joger et al. (2006); Schleich et al. (1996).

### ***Tarentola annularis* (Geoffroy Saint-Hilaire, 1827)**

**Conservation status:** LC

**Distribution:** Relictual species in the Sahara near Tindouf.

**Notes:** Gauthier (1967) .

***Tarentola hoggarensis* Werner, 1937**

**Conservation status:** LC

**Distribution:** Ahaggar and Tassili n'Ajjer. Isolated populations exist near Tindouf.

**Notes:** Trape et al. (2012); Schleich et al. (1996)

***Tarentola neglecta* Strauch, 1887**

**Conservation status:** LC

**Distribution:** Aurès, Biskra, Touggourt, Ouargla.

**Notes:** Trape et al. (2012); Doumergue (1901); Boulenger (1891).

***Ptyodactylus togoensis* Tornier, 1901**

**Conservation status:** LC

**Distribution:** The south (Ahaggar, Tassili).

**Notes:** Metallinou et al. (2015); Trape et al. (2012); Schleich et al. (1996).

***Ptyodactylus oudrii* Lataste, 1880**

**Conservation status:** LC

**Distribution:** Aurès, Bou saada, Beni Ouenif, Ghardaïa, Laghouat, El Goléa, Biskra, Béni Abbès, Aïn Sefra.

**Notes:** Le Berre (1989).

***Hemidactylus turcicus* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** El Kala, Oran, Algiers, Annaba, Oum El Bouaghi.

**Notes:** Bezaz (2021); Rouag and Benyacoub (2006); Schleich et al. (1996); Boulenger (1891).

***Stenodactylus sthenodactylus* (Lichtenstein, 1823)**

**Conservation status:** DD

**Distribution:** Aguelmane Assar (Tassili n'Ajjer), M'sila.

**Notes:** Benelkadi et al. (2021); Metallinou et al. (2012)

***Stenodactylus mauritanicus* Guichenot, 1850**

**Conservation status:** LC

**Distribution:** Oran; Tindouf, Aïn Séfra, Biskra, Ghardaïa, Bou Saada, Ouargla.

**Notes:** Schleich et al. (1996); Doumergue (1901); Boulenger (1891); Guichenot (1850).

***Stenodactylus petrii* Anderson, 1896**

**Conservation status:** LC

**Distribution:** Tindouf, Touggourt, M'raier, Aïn Séfra, Biskra, Ghardaïa, Zelfana, Bou Saada, El Goléa, Ouargla.

**Notes:** Schleich et al. (1996).

***Tropicolotes tripolitanus* Peters, 1880**

**Conservation status:** LC

**Distribution:** Tindouf, Ahaggar, Biskra, Figuig and Kenadsa.

**Notes:** Schleich et al. (1996).

***Tropicolotes algericus* Loveridge, 1947**

**Conservation status:** LC

**Distribution:** Ahaggar, Tindouf, Biskra, Kenadsa.

**Notes:** Trape et al. (2012) .

***Tropicolotes nubicus* Baha El Din, 1999**

**Conservation status:** LC

**Distribution:** Southern Algeria (Tassili n'Ajjer and Ahaggar).

**Notes:** Machado et al. (2021) .

***Tropicolotes chirioi* Ribeiro-Júnior, Koch, Flecks, Calv & Meiri, 2022**

**Conservation status:** DD

**Distribution:** North-eastern Algeria (the Aurès Mountains).

**Notes:** Ribeiro-Júnior et al. (2022) .



***Tropicolotes tassiliensis* Ribeiro-Júnior, Koch, Flecks, Calv & Meiri, 2022**

**Conservation status:** DD

**Distribution:** Southern Algeria (Tassili n'Ajjer and Ahaggar).

**Notes:** Ribeiro-Júnior et al. (2022) .

***Cyrtopodion scabrum* (Heyden, 1827)**

**Conservation status:** DD

**Distribution:** North-eastern Sahara (El Oued). South-eastern Algeria (El Menea and Ouargla Province)

**Notes:** Mouane (2022); Sadine et al. (2021); Mouane (2020).

***Saurodactylus mauritanicus* (Duméril and Bibron, 1836)**

**Conservation status:** LC

**Distribution:** Djebel Mizab (sebdou), Tiaret, Alger. A relict population north of Ghardaïa.

**Notes:** Le Berre (1989) .

***Chalcides minutus* Caputo, 1993**

**Conservation status:** VU

**Distribution:** Théniet El Had National Park.

**Notes:** Montero-Mendieta et al. (2017) .

***Chalcides ocellatus* (Forskål, 1775)**

**Conservation status:** LC

**Distribution:** Oum El Bouaghi, Oran, El Oued, El Kala, Constantine.

**Notes:** Bezaz (2021); Rouag and Benyacoub (2006); Schleich et al. (1996); Gauthier (1967).

***Chalcides parallelus* Doumergue, 1901**

**Conservation status:** EN

**Distribution:** North-western Algeria (occurring mainly along a narrow coastal strip).

**Notes:** Beddek (2017) .

### ***Chalcides mauritanicus* (Lataste and Rochebrune, 1876)**

**Conservation status:** EN

**Distribution:** Coastal districts of north-western Provinces (Oran).

**Notes:** Sindaco et al. (2013); Schleich et al. (1996); Doumergue (1901); Boulenger (1891).

### ***Chalcides chalcides* (Linnaeus, 1758)**

**Conservation status:** DD

**Distribution:** Only one observation in the El Kala National Park.

**Notes:** Rouag and Benyacoub (2006) .

### ***Chalcides mertensi* Klausewitz, 1954**

**Conservation status:** LC

**Distribution:** Forest areas in northern Algeria.

**Notes:** Benelkadi et al. (2021); Rouag and Benyacoub (2006); Caputo et al. (1993).

### ***Chalcides boulengeri* Anderson, 1892**

**Conservation status:** LC

**Distribution:** Southern Algeria (Tassili n'Ajjer and Ahaggar).

**Notes:** Uetz (2021); Trape et al. (2012).

### ***Chalcides delislei* (Lataste and Rochebrune, 1876)**

**Conservation status:** LC

**Distribution:** Southern Algeria (Tassilli n'Ajjer et Ahaggar).

**Notes:** Uetz (2021); Beddek (2017).

### ***Heremites vittatus* (Olivier, 1804)**

**Conservation status:** LC

**Distribution:** Oued Souf; Biskra.

**Notes:** Boulenger (1891); Lallemand (1867).

***Scincus scincus* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Oued Souf, Touggourt, Ouargla.

**Notes:** Lallemand (1867) .

***Eumeces algeriensis* Peters, 1864**

**Conservation status:** LC

**Distribution:** The northwest (Oran; Aïn-Temouchent).

**Notes:** Schleich et al. (1996); Doumergue (1901); Strauch (1862).

***Eumeces schneideri* (Daudin, 1802)**

**Conservation status:** LC

**Distribution:** North-eastern Algéria.

**Notes:** Schleich et al. (1996) .

***Scincopus fasciatus* (Peters, 1864)**

**Conservation status:** LC

**Distribution:** Relictual species in Touggourt and Biskra.

**Notes:** Doumergue (1901); Schleich et al. (1996).

***Scincus albifasciatus* Boulenger, 1890**

**Conservation status:** LC

**Distribution:** Tassili n'Ajjer, d'El-Meniaa (El-Goléa).

**Notes:** Schleich et al. (1996).

***Trachylepis quinquetaeniata* (Lichtenstein, 1823)**

**Conservation status:** NE

**Distribution:** Only one observation in El Hamdania (50 km au sud d'Alger).

**Notes:** Rouag (2016).

### ***Acanthodactylus erythrurus* (Schinz, 1833)**

**Conservation status:** LC

**Distribution:** Northern Algeria (El Kala, Oran, Algiers, Bordj-Bou-Arrierij, Tebessa, M'sila).

**Notes:** Benelkadi et al. (2021); Rouag (2016); Boulenger (1891).

### ***Acanthodactylus boskianus* (Daudin, 1802)**

**Conservation status:** LC

**Distribution:** Arid and Saharan areas (Ghardaia, Berrian, Laghouat, Bou-Saada).

**Notes:** Tamar et al. (2016); Sindaco et al. (2013); Trape et al. (2012); Schleich et al. (1996); Boulenger (1891).

### ***Acanthodactylus maculatus* (Gray, 1838)**

**Conservation status:** LC

**Distribution:** Covers the north of the country in the High Plateaus.

**Notes:** Tamar et al. (2016); Schleich et al. (1996); Salvador (1982); Doumergue (1901).

### ***Acanthodactylus scutellatus* (Audouin, 1827)**

**Conservation status:** LC

**Distribution:** Béni Abbès, Béchar, In Salah, Tassili, Touggourt, Ouargla, Biskra, Laghouat, Bou Saada.

**Notes:** Schleich et al. (1996); Salvador (1982); Boulenger (1891).

### ***Acanthodactylus dumerilii* (Miline-Edwards, 1829)**

**Conservation status:** LC

**Distribution:** Ergs of the north of the Sahara (Biskra, Touggourt, Laghouat and Bou Saada).

**Notes:** Trape et al. (2012); Wilms et al. (2009); Crochet et al. (2008); Schleich et al. (1996); Boulenger (1891).

***Acanthodactylus longipes* Boulenger, 1918**

**Conservation status:** LC

**Distribution:** Ergs of the Sahara (Oued Souf, Ouargla).

**Notes:** Schleich et al. (1996); Salvador (1982).

***Acanthodactylus bedriagai* Lataste, 1881**

**Conservation status:** NT

**Distribution:** The Oriental Plateaux of Algeria (Constantine, Setif; Batna, Oum El Bouaghi).

**Notes:** Bezaz (2021); Salvador (1982); Doumergue (1901).

***Acanthodactylus savignyi* (Audouin, 1827)**

**Conservation status:** NT

**Distribution:** Dune beaches of Mostaganem, Oran and Ain T'émouchent.

**Notes:** Beddek (2017); Doumergue (1901).

***Acanthodactylus spinicauda* Doumergue, 1901**

**Conservation status:** CR

**Distribution:** El Abiod Sidi Cheikh.

**Notes:** Dellaoui et al. (2015); Doumergue (1901).

***Acanthodactylus taghitensis* Geniez and Foucart, 1995**

**Conservation status:** DD

**Distribution:** Tindouf and Taghit.

**Notes:** Geniez and Foucart (1995) .

***Acanthodactylus blanci* Doumergue, 1901**

**Conservation status:** EN

**Distribution:** Eastern Algeria extending from Tebessa to Algiers.

**Notes:** Miralles et al. (2020); Boulenger (1891).

***Psammodromus algirus* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Northern Algeria (Annaba, El Kala, Oum El Bouaghi, M'sila, Oran).

**Notes:** Benelkadi et al. (2021); Rouag and Benyacoub (2006); Schleich et al. (1996); Boulenger (1891) .

***Psammodromus blanci* (Lataste, 1880)**

**Conservation status:** NT

**Distribution:** The Aurès and the steppes of the High Plateaus.

**Notes:** Beddek et al. (2018); Trape et al. (2012).

***Ophisops occidentalis* (Boulenger, 1887)**

**Conservation status:** LC

**Distribution:** The Saharan Atlas (Batna, Oum El Bouaghi, Tebessa).

**Notes:** Bezaz (2021); Schleich et al. (1996); Boulenger (1891).

***Ophisops elegans* Menetries, 1832**

**Conservation status:** DD

**Distribution:** The Saharan Atlas (Aurès).

**Notes:** Schleich et al. (1996); Chirio and Blanc (1993).

***Mesalina olivieri* (Audouin, 1829)**

**Conservation status:** LC

**Distribution:** Steppes and arid regions (Oran, Oum El Bouaghi).

**Notes:** Bezaz (2021); Pizzigalli et al. (2021); Trape et al. (2012); Schleich et al. (1996); Doumergue (1901); Boulenger (1891).

***Mesalina guttulata* (Lichtenstein, 1823)**

**Conservation status:** LC

**Distribution:** Tlemcen, Bou Saada; Mecheria, Saïda, Béni Abbès, Erg Occidental, Erg Chech, Laghouat, Ahaggar.

**Notes:** Trape et al. (2012); Schleich et al. (1996); Doumergue (1901); Strauch (1862).

***Mesalina pasteuri* (Bons, 1960)**

**Conservation status:** LC

**Distribution:** The dunes of ergs (Beni Abbès, Amguid, Ahaggar).

**Notes:** Trape et al. (2012); Gauthier (1967); Gauthier (1965) .

***Mesalina rubropunctata* (Lichtenstein, 1823)**

**Conservation status:** LC

**Distribution:** In the Sahara, in arid areas with stony or rocky soil, rarely sandy.

**Notes:** Trape et al. (2012); Gauthier (1967); Gauthier (1965); Seurat (1930).

***Timon pater* (Lataste, 1880)**

**Conservation status:** LC

**Distribution:** North of Algeria (Khroumirie, High Plateaus, Aures, Kabylie).

**Notes:** Uetz (2021); Schleich et al. (1996).

***Timon tangitanus* (Boulenger, 1889)**

**Conservation status:** LC

**Distribution:** North-west of Algeria (Senalba in Djelfa, Stiten, El Bayad).

**Notes:** Beddek (2017).

***Podarcis vaucheri* (Boulenger, 1905)**

**Conservation status:** LC

**Distribution:** Tlemcen, Constantine, Setif, Beni Mansour, Tebessa, Oran, El Kala, Oum El Bouaghi.

**Notes:** Bezaz (2021); Rouag and Benyacoub (2006) Strauch (1862); Boulenger (1891); Doumergue (1901).

***Scelarcis perspicillata* (Duméril and Bibron, 1839)**

**Conservation status:** LC

**Distribution:** Northwest of Algeria (Oran).

**Notes:** Uetz (2021); Doumergue (1901).

### ***Philochortus zolii* Scortecci, 1934**

**Conservation status:** DD

**Distribution:** Tamanrasset (on the road to Adriane and in the Municipality of Tagmart-East

**Notes:** Scheinberg and Fong (2024); Haddad et al. (2024).

### ***Chamaeleo chamaeleon* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** The north (Oum El Bouaghi, M'sila, Oran).

**Notes:** Bezaz (2021); Benelkadi et al. (2021); Trape et al. (2012); Schleich et al. 1996; Boulenger (1891); Doumergue (1901).

### ***Varanus griseus* (Daudin, 1803)**

**Conservation status:** LC

**Distribution:** Occupies the entire Sahara.

**Notes:** Benelkadi et al. (2021); Trape et al. (2012); Schleich et al. (1996); Boulenger (1891); Doumergue (1901).

### ***Hyalosaurus koellikeri* (Günther, 1873)**

**Conservation status:** DD

**Distribution:** Northwest of Algeria (Tlemcen Mountains).

**Notes:** Mateo et al. (1998).

### ***Uromastyx acanthinura* Bell, 1825**

**Conservation status:** LC

**Distribution:** Central and eastern Algeria (Tlemcen, Bou-Saada and the Mزاب; Mecheria, Saïda).

**Notes:** Trape et al. (2012); Doumergue (1901); Strauch (1862).



***Uromastyx alfredschmidti* Wilms and Böhme, 2001**

**Conservation status:** NT

**Distribution:** South-eastern Algeria and bordering regions of Libya (Tassili n' Ajjer).

**Notes:** Tamar et al. (2017); Trape et al. (2012).

***Uromastyx dispar* Heyden, 1827**

**Conservation status:** LC

**Distribution:** *Uromastyx dispar maliensis* Joger and Lambert, 1996 in south-western Algeria (Taoudrart en Tanezrouft). *Uromastyx dispar flavifasciata* Mertens, 1962 in Tindouf.

**Notes:** Trape et al. (2012); Wilms et al. (2009); Wilms et al. (2009).

***Uromastyx geyri* Müller, 1922**

**Conservation status:** NT

**Distribution:** Southern Algeria (Ahaggar and Tassili n'Ajjer).

**Notes:** Trape et al. (2012) .

***Uromastyx nigriventris* Rothschild and Hartert, 1912**

**Conservation status:** LC

**Distribution:** Western Algeria (du Mzab au Guir).

**Notes:** Trape et al. (2012).

***Trapelus tournevillei* (Lataste, 1880)**

**Conservation status:** LC

**Distribution:** Central Algeria in 'Erg Oriental' (Touggourt, Ouargla), 'Erg Occidental' (El Goléa, Béni Abès) and 'Erg er Raoui'.

**Notes:** Schleich et al. (1996).

***Trapelus schmitzi* Wagner et Böhme, 2007**

**Conservation status:** LC

**Distribution:** Southern Algeria (Tassili n'Ajjer).

**Notes:** Uetz (2021); Wagner et al. (2008).

***Trapelus boehmei* Wagner et al., 2011**

**Conservation status:** LC

**Distribution:** Sahara (Bechar).

**Notes:** Uetz (2021); Wagner et al. (2011).

***Agama bibronii* A. Duméril in Duméril & Duméril, 1851**

**Conservation status:** LC

**Distribution:** Northwestern Algeria (Tlemcen, Bou Saada and the Mزاب; Mecheria, Saïda)

**Notes:** Uetz (2021); Trape et al. (2012); Doumergue (1901); Strauch (1862).

***Agama tassiliensis* Geniez, Padial and Crochet, 2011**

**Conservation status:** LC

**Distribution:** Tassili n'Ajjer and Ahaggar.

**Notes:** Trape et al. (2012); Geniez et al. (2011).

***Trogonophis wiegmanni* Kaup, 1830**

**Conservation status:** LC

**Distribution:** Mostaganem, Algiers, Oran, Biskra, Oum El Bouaghi.

**Notes:** Bezaz (2021); Schleich et al. (1996); Boulenger (1891); Lallemand (1867); Strauch (1862).

***Malpolon monspessulanus* (Hermann, 1804)**

**Conservation status:** LC

**Distribution:** North-western Algeria (Mecheria, Saïda, M'sila).

**Notes:** Benelkadi et al. (2021); Schleich et al. (1996); Doumergue (1901).

***Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827)**

**Conservation status:** LC

**Distribution:** The north-eastern and the centre of Algeria (Oum El Buaghi, El Kala).

**Notes:** Bezaz (2021); Rouag and Benyacoub (2006); Schleich et al. (1996); Doumergue (1901).

### ***Malpolon moilensis* (Reuss, 1834)**

**Conservation status:** LC

**Distribution:** Wide distribution throughout the Algerian Sahara (Bou Saada, Biskra, El-Abiod-Sidi-Cheikh).

**Notes:** Schleich et al. (1996); Doumergue (1901); Olivier (1894).

### ***Natrix astreptophora* (Seoane, 1884)**

**Conservation status:** LC

**Distribution:** La Chiffa, El Kala.

**Notes:** Rouag and Benyacoub (2006); Schleich et al. (1996); Doumergue (1901).

### ***Natrix maura* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Algiers, El Kala, Oum El Bouaghi.

**Notes:** Bezaz (2021); Rouag and Benyacoub (2006); Schleich et al. (1996); Lallemand (1867).

### ***Hemorrhois hippocrepis* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Northern Algeria (El Kala, Sebdou, Oum El Bouaghi, M'sila).

**Notes:** Benelkadi et al. (2021); Bezaz (2021); Rouag and Benyacoub (2006); Schleich et al. (1996); Doumergue (1901).

### ***Hemorrhois algirus* (Jan, 1863)**

**Conservation status:** LC

**Distribution:** In the North, the steppe environments (Oran, Nâama, Ain Ain Sefra, Oum El Bouaghi). In the South in Tassili.

**Notes:** Bezaz (2021); Trape et al. (2012); Doumergue (1901); Boulenger (1891).

***Lytorhynchus diadema* (Duméril, Bibron and Duméril, 1854)**

**Conservation status:** LC

**Distribution:** Bénis Abbès, El Oued, Mraïer, Sud Oranais, Souf, Ahaggar, Tassili n'Ajjer.

**Notes:** Trape and Mané (2006); Schleich et al. (1996); Boulenger (1891).

***Spalerosophis diadema* (Schlegel, 1837)**

**Conservation status:** LC

**Distribution:** Ouargla, Biskra.

**Notes:** Doumergue (1901) .

***Spalerosophis dolichospilus* (Werner, 1923)**

**Conservation status:** DD

**Distribution:** M'sila, Beni Abbès, Ouargla, Ghardaïa, Ahaggar, Aïn Sefra, Biskra, Oued Rhir.

**Notes:** Benelkadi et al. (2021); Schleich et al. (1996); Gauthier (1967); Doumergue (1901); Boulenger 1891.

***Telescopus obtusus* (Reuss, 1834)**

**Conservation status:** DD

**Distribution:** Mertoutek (Ahaggar) and In-Sebuk Oua Mellen (Immidir).

**Notes:** Crochet et al. (2008) .

***Telescopus tripolitanus* (Werner, 1909)**

**Conservation status:** DD

**Distribution:** Tindouf.

**Notes:** Crochet et al. (2008) .

***Coronella girondica* (Daudin, 1803)**

**Conservation status:** LC

**Distribution:** Northern Algeria (Djelfa).

**Notes:** Schleich et al. (1996); Lallemand (1867).

***Macroprotodon abubakeri* Wade, 2001**

**Conservation status:** DD

**Distribution:** North-western Algeria (Oran, Habibas Islands).

**Notes:** Carranza et al. (2004); Wade (2001).

***Macroprotodon mauritanicus* Guichenot, 1850**

**Conservation status:** LC

**Distribution:** North-eastern Algeria (Oum El Bouaghi).

**Notes:** Bezaz (2021); Busack and McCoy (1990).

***Macroprotodon brevis* (Günther, 1862)**

**Conservation status:** LC

**Distribution:** Northern Sahara from the Moroccan border to the Tunisian border. Isolated population also exists in the Ahaggar in southern Algeria.

**Notes:** Geniez (2015); Carranza et al. (2004); Strauch (1862).

***Platyceps saharicus* Schätti and McCarthy, 2004**

**Conservation status:** LC

**Distribution:** Southern Algeria (Immdir Massif).

**Notes:** Geniez (2015); Geniez and Guathier (2008).

***Psammophis schokari* (Forskal, 1775)**

**Conservation status:** LC

**Distribution:** Aïn-Sefra; Béni Ounif, Reggane, Beni-Abbès, Oum El Bouaghi, Ahggar, Djbel Aissa.

**Notes:** Benelkadi et al. (2021); Gauthier (1967); Lallemand (1867); Gervais (1836).

***Psammophis aegyptius* Marx, 1958**

**Conservation status:** DD

**Distribution:** Tassili, Ahaggar.

**Notes:** Boulaouad (2023); Trape and Mané (2006); Schleich et al. (1996).

### ***Myriopholis algeriensis* (Jacquet, 1896)**

**Conservation status:** LC

**Distribution:** Beni Abbès, Biskra, Tassili n'Ajjer.

**Notes:** Trape (2002); Baha El Din (2001); Schleich et al. (1996).

### ***Naja haje* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Biskra, Beni Ounif, Chott Melghir, Beni Abbès, Bir El Ater.

**Notes:** Boulenger (1891) .

### ***Cerastes cerastes* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Wide distribution throughout the Algerian Sahara (Ahaggar, Tassili n'Ajjer, Beni Ounif, Biskra, Saïda; M'sila).

**Notes:** Benelkadi et al. (2021); Schleich et al. (1996); Boulenger (1891); Strauch (1862).

### ***Cerastes vipera* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** Wide distribution throughout the Algerian Sahara (Béni Abbès Ahaggar, Tassili n'Ajjer).

**Notes:** Schleich et al. (1996); Gauthier (1967); Doumergue (1901).

### ***Daboia mauritanica* Gray, 1849**

**Conservation status:** LC

**Distribution:** Between the Tellian Atlas and the Saharan Atlas (Oum El Bouaghi, Nâama, M'sila, Oran).

**Notes:** Bezaz (2021); Benelkadi et al. (2021); Schleich et al. (1996); Doumergue (1901).

***Echis pyramidum* (Geoffroy Saint-Hilaire, 1827)**

**Conservation status:** LC

**Distribution:** Biskra, Constantine, isolated populations in the Ahaggar and Tassili n'ajjer.

**Notes:** Geniez 2015; Trape and Mané 2006; Schleich et al. 1996.

***Vipera monticola* Saint Girons, 1953**

**Conservation status:** VU

**Distribution:** Restricted to the Tell Atlas in the mountain ranges of the north of Algeria (Annaba, Jijel, Tizi Ouzou, Bejaia, Tlemcen, Skikda).

**Notes:** Martínez-Freiría et al. (2021); Bouam et al. (2018); Schleich et al. (1996); Olivier (1894).

***Eryx jaculus* (Linnaeus, 1758)**

**Conservation status:** LC

**Distribution:** The north especially the High Plateaus and semi-arid zones (Oran, Oued Magra, Biskra, Batna, M'sila).

**Notes:** Benelkadi et al. (2021); Schleich et al. (1996); Boulenger (1891); Strauch (1862).

## Analysis

### Conservation status of Reptiles

In this study, all the reptile species were evaluated for their global conservation status according to the IUCN system. This status represents an important tool with regard to identifying priorities for species conservation. All reptile species in Algeria are included in the IUCN Red List. As very few works cover the distribution of reptiles in Algeria, this evaluation is only approximate and requires a continuous update of the data. The number of species in the different IUCN Red List Categories is shown in Table 2.

To summarise, 30.19% of Algerian reptile species are globally threatened, with 0.96% Critically Endangered, 3.85% Endangered, 4.81% Vulnerable and 5.77% Near Threatened. A total of 70.19% (73 species) were assessed as Least Concern and 15 (14.42%) species were considered to be Data Deficient. It should be mentioned that all species of Testudines are threatened (Fig. 1).

Table 2.

Summary of the global Red List status for Reptiles of Algeria.

Least Concern (LC)	Near Threatened (NT)	Vulnerable (VU)	Endangered (EN)	Critically Endangered (CR)	Data Deficient (DD)	Not Evaluated (NE)
73	06	05	04	01	15	0

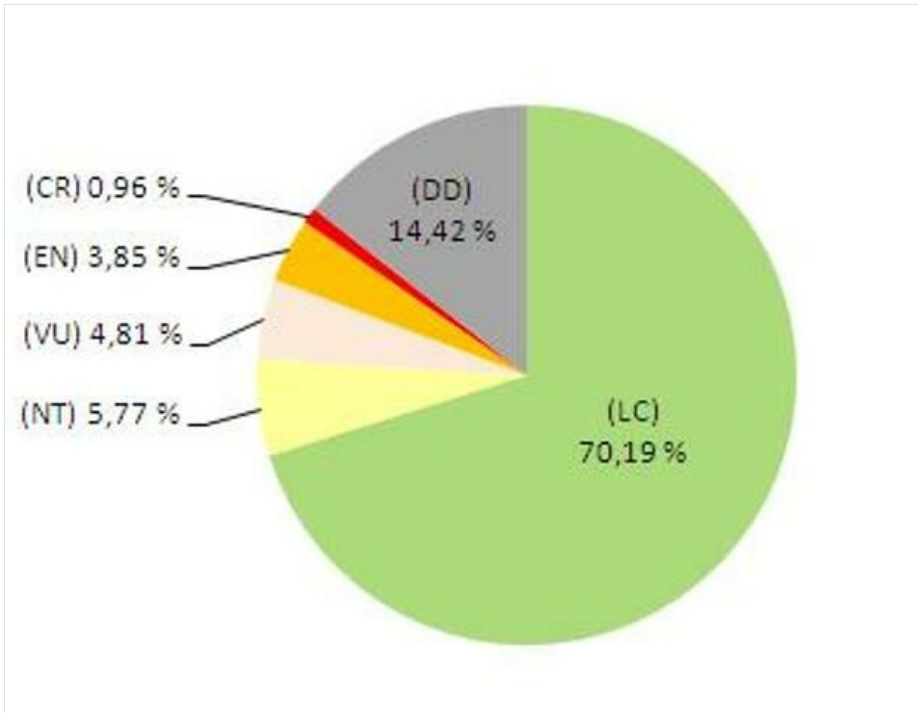


Figure 1. [doi](#)

Summary of the conservation status of reptiles in Algeria.

### Endemic status of Reptiles

The richness of the Algerian herpetofauna is a result of various factors, including geographical, climatic and topographical conditions. These factors have further contributed to the isolation and diversification of many taxa which has allowed the presence of several species that are endemic to Algeria or that are shared with Tunisia, Morocco or Libya. A total of 16.98% of the Reptiles in Algeria (18 species) are endemic species to the Maghreb, of which 22.22% are endemic to Algeria and are represented by four species of lizards (Table 3).



Table 3.

Status of sensitive species.

Species	Endemic	Population trend	Geographic range
<i>Acanthodactylus bedriagai</i>	Algeria	Unknown	Northeast (Aurès)
<i>Acanthodactylus savigny</i>	Algeria	Unknown	Northeast (Coastal regions)
<i>Tropicolotes chirioi</i>	Algeria	Unknown	Northeast (Aurès)
<i>Tropicolotes tassiliensis</i>	Algeria	Unknown	Tassili n'Ajjer
<i>Chalcides mertensi</i>	Algeria-Tunisia	Unknown	Northern
<i>Timon pater</i>	Algeria-Tunisia	Decreasing	Northeast
<i>Tarentola neglecta</i>	Algeria-Tunisia	Stable	Saharan
<i>Timon tangitanus</i>	Algeria - Morocco	Decreasing	Northwest
<i>Scelarcis perspicillata</i>	Algeria - Morocco	Stable	Northwest
<i>Hyalosaurus koellikeri</i>	Algeria – Morocco	Unknown	Northwest
<i>Trapelus tournevillei</i>	Algeria - Morocco	Stable	Saharan
<i>Chalcides minutus</i>	Algeria - Morocco	Decreasing	Tlemcen Mountains
<i>Chalcides parallelus</i>	Algeria - Morocco	Decreasing	Northwest
<i>Chalcides mauritanicus</i>	Algeria - Morocco	Decreasing	Oran-Algiers (Coastal regions)
<i>Eumeces algeriensis</i>	Algeria - Morocco	Stable	Northwest
<i>Vipera monticola</i>	Algeria - Morocco	Decreasing	Tellian Atlas
<i>Saurodactylus mauritanicus</i>	Algeria - Morocco	Decreasing	Northwest
<i>Uromastix alfredschmidtii</i>	Algeria - Libya	Stable	Southern (Tassili n'Ajjer)

## Hotspots for herpetological diversity

To highlight the most important areas for reptile diversity, information related to the status of the different species was compiled. Thus, the different criteria, namely endemism, rarity, IUCN conservation status and species richness by region were combined. Four main regions have been identified through the distribution analysis of vulnerable reptile species:

1. A large region in the north of the country extends over the large coastal mountain ranges and contains the Edough Massif, the Babors and Djurdjura. These regions include threatened and vulnerable species.

- *Mauremys leprosa* (Vulnerable);
- *Testudo graeca* (Vulnerable);
- *Emys orbicularis* (Near Threatened);
- *Vipera monticola* (Vulnerable)

2. The Mountains of Aures represent the region in Algeria with the highest reptile diversity. It includes threatened, rare and endemic species:

- *Mauremys leprosa* (Vulnerable);
- *Testudo graeca* (Vulnerable);
- *Acanthodactylus bedriagai* (endemic);
- *Vipera monticola* (rare, Vulnerable);
- *Tropiocolotes chirioi* (Data Deficient);
- *Ophisops elegans* (Data Deficient).

3. Northwest Region (Oranie)

- *Mauremys leprosa* (Vulnerable);
- *Testudo graeca graeca* (Vulnerable);
- *Chalcides minutus* (Vulnerable);
- *Chalcides parallelus* (Endangered);
- *Chalcides mauritanicus* (Endangered);
- *Scelarcis perspicillata* (endemic);
- *Hyalosaurus koellikeri* (endemic);
- *Eumeces algeriensis* (endemic).

4. A fourth zone in the middle of the Sahara represented by the Massifs of Tassili n'Ajjer and Ahaggar harbouring a particular herpetofauna with rare and threatened species:

- *Uromastix alfredschmidti* (Near Threatened);
- *Tropiocolotes tassiliensis* (Data Deficient);
- *Trapelus schmitzi* (Data Deficient);
- *Uromastix geyri* (Near Threatened);
- *Philochoortus zolii* (Endangered);
- *Psammophis aegyptius* (Data Deficient).

Fig. 2

## Discussion

The distribution of reptiles is related to several factors, mainly habitat diversity and also climatic factors. With an average of 45 species, the Aurès Mountains are the most diversified region of northern Algeria. The topography and the mountainous character of the region, as well as the diversity of its plant cover and the Mediterranean and Saharan climatic influences, have allowed a diversity of reptilian fauna to exist here. Indeed, this area is a real junction where desert and Mediterranean species co-exist.

## Sea turtles

The presence of sea turtles along the Algerian coast is regularly reported, with many beachings, of which 70% are the loggerhead turtle, *Caretta caretta* (Linnaeus, 1758) and

30% of the leatherback Sea turtle, *Dermochelys coriacea* (Vandelli, 1761) (Bennounas and Bennounas 2020, Belmahi et al. 2020). The green Sea turtle *Chelonia mydas* (Linnaeus, 1758) is the rarest species, having been recorded only once since 2003 (Bennounas and Tifoura 2020). The first study of sea turtle nesting on the Algerian coast dates back to 1998 (Laurent 1990), when surveys were unsuccessful and no nests were found. Since then, nesting attempts have been reported on the east coast of Algeria, most recently in 2017, when a loggerhead nest was discovered in Collo (Skikda) (Benabdi and Belmahi 2020). In the summer of 2023, loggerhead nesting was confirmed on the Algerian coast, with hatchlings observed on the "Aftissen" beach of Béni Fergane in the wilaya of Jijel, still in eastern Algeria (Ahmim et al. 2024). Newly-hatched loggerheads were also reported on a beach in Algiers. This confirms the conclusion of Carreras et al. (2018) that these nests represent a new colonisation of the Western Basin by this species of sea turtle, mainly as a result of climate change impacts on migration and reproduction. There may be other nesting sites along Algeria's 1,000 km coastline that have not been identified because there is no dedicated sea turtle monitoring instance.



Figure 2.

Some species of Reptiles of Algeria:

- a: *Emys orbicularis* (Annaba, July 2023) (Photo by R. Rouag); [doi](#)  
 b: *Cerastes cerastes* (Oued Souf, September 2023) (Photo by S. Sidali); [doi](#)  
 c: *Vipera monticola* (Djurdjura National Park, June 2012) (Photo by R. Rouag); [doi](#)  
 d: *Chalcides mertensi* (El Kala National Park, July 2000) (Photo by S. Benyacoub). [doi](#)

## ***Testudo graeca* Linnaeus, 1758**

The Spur-thighed tortoises (*Testudo graeca*) represent the most widely distributed species of tortoise in the Western Palaearctic (Buskirk et al. 2001, Iverson 1992). It is the only terrestrial species that exists in Algeria; it has a wide distribution from the north to the limit of the Saharan Atlas. Phylogeography of North African populations of *T. graeca* has received important interest (Graciá et al. 2017, Fritz et al. 2009, Salinas et al. 2009, Fritz et al. 2007, van der Kuyl et al. 2005, Pieh 2000). Actually, *T. graeca* comprises five subspecies: *Testudo graeca graeca* (Linnaeus, 1758), older synonym of *T. g. soussensis* Pieh, 2000; *Testudo graeca cyrenaica* Pieh & Perälä, 2002; *Testudo graeca marokkensis* Pieh & Perälä, 2004; *Testudo graeca nabeulensis* Highfield, 1990 and *Testudo graeca whitei* (Bennett in White (1836)). It was previously thought that the nominotypical form *T. g. graeca* occurred in the Iberian Peninsula (Alvarez et al. 2000), but Schweiger and Gemel (2020) corrected the confusing history regarding the type locality of *T. g. graeca*, documenting it as Agadir in south-western Morocco, thereby rendering *T. g. whitei* the apparently most correct name for the subspecies on the Iberian Peninsula and north-eastern Morocco and western Algeria (Uetz 2021). In Algeria, two subspecies are identified: *Testudo graeca nabeulensis* occurs in eastern Algeria, inhabiting mainly humid to semi-arid Mediterranean climates and *T. g. whitei* occurs mainly in Algeria (Graciá et al. 2017) in mixed oromediterranean forests of *Cedrus atlantica* (Endl.) Manetti ex Carrière, 1855 and *Quercus ilex* Linnaeus, 1753 (Escoriza et al. 2022). This species is considered endangered across its entire range. In Algeria, the capture and trade of this species has been illegal since 1983 (Décret No. 83-509). This species is threatened by the destruction of its habitats and by the trade, particularly in hatchling and juvenile turtles which are commonly traded in markets as household pets (Rouag 2016, Atoussi et al. 2022).

## **Genus *Acanthodactylus***

*Acanthodactylus* Fitzinger, 1834 constitutes the most species-rich genus in the family Lacertidae, with over 40 recognised species inhabiting a wide variety of dry habitats. The genus has seldom undergone taxonomic revisions and, although there are a number of described species and species-groups, their boundaries, as well as their interspecific relationships, remain largely unresolved (Tamar et al. 2016). The situation in North Africa is complex and the relationships with other species unclear (Harris et al. 2004, Fonseca et al. 2009, Psonis et al. 2016).

In North Africa, *Acanthodactylus* species are divided within three clades: the *erythrurus* and *pardalis* groups occupying the Sub-Saharan Region and the coastal areas of North Africa; the *scutellatus* group, occurring mainly in the sandy areas of North Africa (Tamar et al. 2016).

### ***Acanthodactylus erythrurus* species complex**

*Acanthodactylus erythrurus* (Schinz, 1833), *A. lineomaculatus* Duméril & Bibron, 1839 and *A. blanci* Doumergue, 1901 are part of a group called «*A. erythrurus* species complex»

whose taxonomy is complex and unstable because of their wide distribution and also their great genetic variation (Fonseca et al. 2009).

The Spiny-footed Lizard, *Acanthodactylus erythrurus* is widespread in the Iberian Peninsula and the Maghreb, from Morocco to Tunisia (Fonseca et al. 2009). Numerous attempts have been made to subdivide it into subspecies on the basis of phylogenetic studies (Fonseca et al. 2009, Harris et al. 2004). Miralles et al. (2020) highlighted the existence of five clades in the Maghreb where the divergence between them is broadly similar, supporting the existence of at least five species in the *Acanthodactylus erythrurus* complex: an Ibero-Moroccan clade, a Central Algerian clade (found on the Mediterranean coast, formed by two inland populations situated north and south of the High Plateaux, near Theniet-El-Had and around Djelfa), an Algero-Tunisian clade (Tunisia and coastal populations of eastern Algeria extending from Zemmouri to Sidi Abdelazziz, including populations described under the name *Acanthodactylus blanci*) and two clades from the Eastern and Western High Atlas newly described as *Acanthodactylus lacrymae* Miralles et al., 2020 and *Acanthodactylus montanus* Miralles et al., 2020 (Miralles et al. 2020).

### ***Acanthodactylus pardalis* group**

In northern Africa, with the exception of *Acanthodactylus spinicauda* Doumergue, 1901, the systematics of this group is not clear and there is profound disagreement amongst authors (Fonseca et al. 2008). According to Salvador (1982), this group includes five species: *A. pardalis* (Lichtenstein, 1823), *A. busacki* Salvador, 1982, *A. maculatus* (Gray, 1838), *A. bedriagai* Lataste, 1881 and *A. spinicauda* Doumergue, 1901. *A. maculatus* is covering the Algerian High Plateaux; *A. bedriagai* is restricted to the Oriental Plateaux of Algeria and *A. spinicauda* known only from a place called "Berr'mad" situated 50 km south of El Abiod Sidi Cheikh. However, the systematics of *Acanthodactylus* of the *pardalis* group in the Maghreb needs to be revised as it presents high levels of intraspecific variability and clear evidence of phylogenetic complexity such as *A. maculatus* and *A. bedriagai* populations of the eastern Morocco and Algeria. Tamar et al. (2016) confirmed that *A. maculatus* complex is not a monophyletic taxon, but corresponds to two species (*A. bedriagai* and *A. maculatus*) forming a paraphyletic group.

### ***Acanthodactylus scutellatus* group**

The *Acanthodactylus scutellatus* species group comprises seven recognised species (*A. aegyptius* Baha El Dine, 2007, *A. aureus* Günther, 1903, *A. dumerilii* Miline-Edwards, 1829, *A. longipes* Boulenger, 1918, *A. scutellatus* Audouin, 1827, *A. senegalensis* Chabanaud, 1918 and *A. taghitensis* Geniez and Foucart, 1995) which are abundant and conspicuous across xeric environments of North Africa and the Middle East (Liz et al. 2022). This group is represented in Algeria by *Acanthodactylus taghitensis*, *Acanthodactylus longipes*, *Acanthodactylus dumerilii* and the nominate species *A. scutellatus* which is represented by the monophyletic lineage corresponding to the subspecies *A. s. audouini* Boulenger, 1918 (Tamar et al. 2016). Most species are linked to sandy habitats, but their ecology varies from the soft-sand specialist *A. longipes* to the more generalist *A. scutellatus*. The only exception is *A. taghitensis*, which only occurs in gravel plains (Liz et al. 2022).

### ***Acanthodactylus boskianus* group**

The *boskianus* group is represented by two paraphyletic species, *Acanthodactylus boskianus* in North Africa and *Acanthodactylus schreiberi* Boulenger, 1878 in the Middle East (Tamar et al. 2014). *Acanthodactylus boskianus* is the most widely distributed species of the genus, ranging from Morocco through North Africa to Iran (Uetz 2021). Five morphological subspecies are currently recognised in Bosk's fringe-fingered lizard (Uetz 2021). *A. boskianus asper* (Audouin, 1827) is the only representative of this group in Algeria (Tamar et al. 2016). It has a wide distribution in sandy habitats.

### **Genus *Mesalina***

*Mesalina* species are small, fast, ground-dwelling, diurnal lizards, well-adapted to desert and xeric shrublands. All *Mesalina* taxa can be divided according to their phylogenetic relationships into the following seven assemblages: *M. watsonana* (Stoliczka, 1872), *M. martini* (Boulenger, 1897), *M. rubropunctata* (Lichtenstein, 1823), the *M. adramitana* group, the *M. brevisrostris* group, the *M. guttulata* group and *M. olivieri* (Simó-Riudalbas et al. 2019, Pizzigalli et al. 2021). In Algeria, we record *M. guttulata* (Lichtenstein, 1823) and *M. olivieri* (Audouin, 1829) which are a species complex including a main clade in the Middle East and another in North Africa (Nouira et al. 2022). *M. rubropunctata* (Lichtenstein, 1823) and *M. pasteuri* (Bons, 1960) are monophyletics and occupy most of the Algerian Sahara. *M. rubropunctata* affects arid areas with stony or rocky soil, rarely sandy, whereas *Mesalina pasteuri* occupies the driest regions of the Sahara and is found in the dunes of ergs as well as in plains with more compact sandy soils (Trape et al. 2012).

### **Genus *Tarentola***

Algeria harbours five different species of *Tarentola*, namely: *T. mauritanica* (Linnaeus, 1758), *T. deserti* Boulenger, 1891, *T. neglecta* Strauch, 1887, *T. annularis* (Geoffroy Saint-Hilaire, 1827) and *T. hoggarensis* Werner, 1937, recently elevated to the rank of species based on molecular and morphological data (Trape et al. 2012). *Tarentola mauritanica* is characterised by an extremely high mitochondrial genetic variation in North Africa, which led to the hypothesis that this taxon could be, in fact, a species complex (Harris et al. 2004). In Algeria, its distribution is wide in the northern part up to the Saharan Atlas where it occupies rocky habitats and tree formations; discreetly anthropophilic, it frequents habitations. The Desert Wall Gecko *Tarentola deserti* is a Saharan species endemic to the Maghreb (Joger et al. 2006) not usually present in areas with rainfall below 100 mm annually (Schleich et al. 1996). In Algeria, it is widely distributed in the northern Saharan oases, in the Saharan Atlas and on the High Plateaus. It inhabits rocky deserts (regs), sandy deserts (ergs), dry wadis, palm oases and ruins, where they usually hide in cracks and crevices. Two subspecies have been described from *T. neglecta* Strauch, 1887: *Tarentola neglecta neglecta* Strauch, 1895, in the south of the Sahara-Atlas from Algeria, Tunisia to west Libya and *Tarentola neglecta geyri* Joger, 1984 which occurs in south Algeria in central Sahara, from the south-western edge of the great eastern Erg to the



foothills of the Ahaggar Mountains; the exact delimitation of the distribution area is still unclear (Joger 1984).

### Genus *Cyrtopodion*

This new genus for Algerian herpetofauna, considered invasive, is represented by *Cyrtopodion scabrum* (Heyden, 1827). This species is widely distributed in Afghanistan, Egypt, Ethiopia, India, Iraq, Palestine, Jordan, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, Turkey, United Arab Emirates and Yemen) (Khan 2005, Khan 2008, Cogălniceanu et al. 2014). Moreover, this species is also introduced outside of its native geographical range in Iran Islamic Republic (Rastegar-Pouyani et al. 2010) and in Texas and Nevada in the United States (Bartlett and Bartlett 1999, Stocking and Jones 2017). The first documented record of *C. scabrum* in Algeria was on 27 June 2009 in the north-eastern Sahara from five different locations at El Oued (Mouane 2020) and then also in El Menea (Sadine et al. 2021). A new locality was recorded from Ouargla Province, south-east Algeria (Mouane 2022). The causes of *C. scabrum*'s invasion are most likely due to an accidental introduction linked to the importation of various agricultural products which constitute the main commerce in this region (Mouane 2020). *C. scabrum* is currently more abundant in sites where agricultural activities are important (expanding irrigated lands), specifically the urban areas near date palm plantations (Mouane 2020).

### Genus *Tropicolotes*

A total of 12 species are recognised within the genus *Tropicolotes*, covering a distribution range from Atlantic Sahara, Maghreb, Levant, Arabian Peninsula and Iran (Machado et al. 2021). *Tropicolotes* was divided into two highly-divergent groups, one comprising the African clade formed by *Tropicolotes algericus* Loveridge, 1947 and *Tropicolotes tripolitanus* Peters, 1880 and the other comprising the Saharo-Arabian clade (*T. nattereril* *T. confusus*/ *T. scortecii* *T. naybandensis*/ *T. bisharicus*/ *T. somalicus*/ *T. steudneril* *T. nubicus*) (Machado et al. 2018). In Algeria, we found the two groups represented by:

-*Tropicolotes tripolitanus* Peters, 1880, in the Algerian Sahara and reported in Tindouf, Ahaggar, Biskra, Figuig and Kenadsa (Schleich et al. 1996);

-*Tropicolotes algericus* Loveridge, 1947, in the westernmost portion of the Saharan Atlas Mountain Range, with a disjunct population in the northern portion of the Tademaït Rocky Plateau (Ribeiro-Júnior et al. 2022). Considered as a subspecies of *T. tripolitanus*, it was elevated to species rank by Baha El Din (2001).

-*Tropicolotes nubicus* Baha El Din, 1999, in southern Algeria (Tassili n'Ajjer and Ahaggar). Phylogenetic results of Machado et al. (2021) grouped *Tropicolotes steudneri* from Niger and southern Algeria within *Tropicolotes nubicus* Baha El Din, 1999, while *T. steudneri* specimens were only found east of the Nile River.

Recently, two new species were reported for Algerian *Tropicolotes* by Ribeiro-Júnior et al. (2022) on the basis of external morphology and osteological characters; these are:

-*Tropicolotes chirioi* Ribeiro-Júnior, Koch, Flecks, Calv & Meiri, 2022; Described on specimens collected by Laurent Chirio. The type-locality is situated in the Aurès Mountains (north-eastern Algeria).

-*Tropicolotes tassiliensis* Ribeiro-Júnior, Koch, Flecks, Calv & Meiri, 2022, in southern Algeria (Tassili n'Ajjer and Ahaggar). The type-locality is situated 3 km east of Tamanrasset on the road to Adriane in the Tassili n'Ajjer mountain (south-eastern Algeria).

## Genus *Uromastyx*

On molecular biology arguments, Wilms et al. (2009) elevated the subspecies *Uromastyx acanthinurus nigriventris* Rothschild & Hartet, 1912 to the status of a separate species *Uromastyx nigriventris* Rothschild and Hartert, 1912 which is distributed in Morocco and western Algeria (from Mzab to Guir) (Trape et al. 2012). This species is replaced in central and eastern Algeria by the North African spiny-tailed Lizard *Uromastyx acanthinura* Bell, 1825. The species *Uromastyx alfredschmidti* Wilms and Böhme, 2001, is a large lizard occupying the Tassili Massif n' Ajjer in south-eastern Algeria and bordering regions of Libya where it is often associated with areas of large boulders (Trape et al. 2012). The distribution area of Saharan Spiny-tailed Lizard *Uromastyx geyri* Müller 1922 extends from the mountainous massifs and rocky plateaus of the central Sahara, from the Air in Niger to the Adrar des Iforas in Mali towards the North, where it reaches Ahaggar and the Amguid Region of Tassili n'Ajjer in Algeria (Trape et al. 2012). *Uromastyx dispar maliensis* Joger and Lambert, 1996 also lives in north-western Mali, in the Tilemsi Valley, on the edge of the Adrar des Iforas and in south-western Algeria (Taoudrart en Tanezrouft) (Wilms et al. 2009). *Uromastyx dispar maliensis* and *U. geyri* are sympatric in the Adrar des Iforas Region (Joger and Lambert 1996). The northernmost locality of *U. d. maliensis* is Gara Djenoum / Monts du Ahaggar (Wilms and Böhme 2001). *Uromastyx dispar flavifasciata* Mertens, 1962 occupies the north of Western Sahara and the Tindouf Region in Algeria near the Moroccan border where it exists in rocky areas and stony plains (Trape et al. 2012).

## Genus *Tournevillei* / *Agama*

*Agama bibronii* A. Duméril in Duméril & Duméril, 1851 is the valid name for the North African rock agama (Denzer 2021). This species ranges from the Atlantic coastal region of Western Sahara, through most of Morocco to north-western Algeria (Trape et al. 2012). *Agama tassiliensis* (Geniez, 2011) is a newly-described species (Geniez et al. 2011) previously part of the populations of *Agama impalearis* Boettger, 1874. The range of this species extends over the large mountain massifs and rocky areas of the central Sahara: Adjar des Ifhoras (Mali), Air (Niger) and Tibesti (Chad). In Algeria, it is present in Tassili n'Ajjer and Ahaggar. Another species newly described by Wagner et al. (2011) on the bases of molecular phylogeny and morphology is *Trapelus boehmei* (Wagner 2011) which occurs in Mauritania, Morocco and Algeria where its presence covers the entire Sahara. Previously, it was part of *Trapelus mutabilis* Merrem, 1820 which is found throughout the Saharan desert region, from the Saharan Atlas in the north and to the Saharan-Sudanese borders, from the Atlantic to Egypt. The Sahara *Agama* *Trapelus tournevillei* (Lataste 1880)



is located in two distinct parts of central Algeria and is also present in 'Erg Oriental' (Tougourt, Ouargla), 'Erg Occidental' (El Goléa, Béni Abès) and 'Erg er Raoui' (Schleich et al. 1996). *Trapelus schmitzi* Wagner & Böhme, 2007 was recently described on the basis of a single specimen from the Ennedi Mountains (Chad). The second voucher from The Natural History Museum of the City of Geneva (MHNG 901.70) collection was collected by J. Juge in 1952 in Algeria at Tassili n'Ajjer, a 500 km long mountain chain in south-eastern, near the Ahaggar Mountains (Wagner et al. 2008). No data are available on this species in Algeria; it is classified as Data Deficient (DD) on the IUCN Red List.

## Family Scincidae

*Chalcides minutus* Caputo, 1993, is a little-known species found in northern Morocco. In 2014, Montero-Mendieta et al. discovered a skink belonging to the *Chalcides* genus in Théniet El Had National Park (Algeria). Initially classified as *Chalcides mertensi* Klausewitz, 1954 due to its morphological similarity and distribution, this skink was surprisingly found to be genetically closely related to specimens of *Chalcides minutus* (Caputo, 1993). Genetic analysis can help to understand the phylogeny of the *Chalcides minutus-mertensi* species complex (Montero-Mendieta et al. 2017). *Chalcides mauritanicus* (Duméril and Bibron 1839) endemic to north-eastern Morocco and north-western Algeria was first described by Doumergue (1901) from the littoral area of north-western Algeria; it is narrowly restricted to coastal districts of the Algiers and Oran Provinces (Pasteur 1981). *Chalcides parallelus* (Doumergue, 1901) is also endemic to north-eastern Morocco and north-western Algeria occurring mainly along a narrow coastal strip of approximately 250 km between Nador in north-eastern Morocco and Cape Carbón in north-western Algeria. This species has a similar distribution to *Chalcides mauritanicus*, but is found far from the dune cordon, especially on islands (Beddek 2017). The main distribution of this species is on beaches. Its presence in sandy biotopes indicates the potential dangers of excessive sand extraction from beaches (Beddek 2017). Within the *Sincus scincus* complex, Arnold and Leviton (1977) identified two subspecies in Algeria: *S. s. cucullatus* Werner, 1914, in north-eastern Algeria and *S. s. laterimaculatus* Werner, 1914, in north-western Algeria.

## Genus *Macroprotodon*

*Macroprotodon* are colubrids that are found in mainly Mediterranean areas of North Africa, the Iberian Peninsula (Iberia) and on some western Mediterranean islands (Doumergue 1901, Busack and McCoy 1990, Wade 2001, Carranza et al. 2004). The taxonomy of this genus in North Africa is still largely unclear and systematic studies integrating genetics and morphology are necessary to clarify the situation (Nouira et al. 2022). In Algeria, Wade (2001) recognises three species: *Macroprotodon cucullatus* (Geoffroy de St Hilaire, 1827) occurs in relatively arid areas and divided in two subspecies: *M. c. cucullatus* and *M. cucullatus textilis* (Duméril and Bibron, 1854), while *M. mauritanicus* Guichenot, 1850 and *M. abubakeri* Wade, 2001, occurs mainly further north and even occupying some islands. *Macroprotodon abubakeri* was recently described by Wade (2001) and its status has recently been confirmed from genetic data (Carranza et al. 2004). This species is known from north-western Algeria and also occurs on Habibas

Islands. There is very little recent information on this species and it apparently lives in semi-arid and sub-humid Mediterranean habitats. On the other hand, *M. mauritanicus* is distributed according to Busack and McCoy (1990) in north-eastern Algeria. *Macroprotodon cucullatus* requires a taxonomic revision as it appears to be paraphyletic, as indicated by Carranza et al. (2004). *Macroprotodon cucullatus textilis* is the subspecies found in the entire northern part of the Algerian Sahara and isolated population exists also in the Ahaggar in southern Algeria. Geniez (2015), based exclusively on morphology, considers that *M. cucullatus textilis* should be included within *Macroprotodon brevis* (Günther 1862), which was also reflected in later works (Martínez del Marmol et al. 2019). In the present work, we will also consider this classification. A proper understanding of *M. cucullatus* must await the availability of DNA samples from a much wider range of populations, including ones distant from *M. brevis* and *M. mauritanicus*, such as the isolates in the Ahaggar (Algeria) (Carranza et al. 2004).

### Genus *Daboia*

Algerian *Daboia* vipers include two species, *Daboia mauritanica* Gray, 1849 and *Daboia deserti* (Anderson, 1892) with controversial range delimitations where *Daboia mauritanica* is distributed between the Tellian Atlas and the Saharan Atlas and *Daboia deserti* occupies a narrow strip of the Saharan Atlas, from western Algeria, towards Tunisia. Based on a molecular study on North African *Daboia* vipers, Martínez-Freiria et al. (2017) do not support the occurrence of two distinct taxa, revealing that the *deserti* taxon can no longer be admitted as a valid species and all North African species should thus be referred to as *D. mauritanica*. Furthermore, *D. deserti* is identified as an invalid taxon.

### Genus *Echis*

The genus *Echis* Merrem, 1820 is one of the most complex genera of snakes in Africa, its being found throughout the semi-arid/xeric regions of Western Africa, thence eastwards to southern Asia (Uetz 2021). Recent genetic studies have subdivided the genus *Echis* into four main clades consisting of the *E. ocellatus*, *E. coloratus*, *E. pyramidum* and *E. carinatus* groups (Pook et al. 2009). Within the *E. pyramidum* (Geoffroy Saint-Hilaire, 1827) clade, *E. leucogaster* Roman, 1972 inhabits the western Sahel Region, with possibly isolated populations in the Algerian Ahaggar massif and Tassili n'ajjer (Pook et al. 2009, Geniez 2015). In North Africa, recent genetic analysis has shown that the genetic variability between the *Echis leucogaster* and *Echis pyramidum* group is very low and some authors suggest the existence of a single species with several subspecies (Arnold et al. 2009). Due to its low genetic variability, it has been proposed that the species *Echis leucogaster* is considered a subspecies of *Echis pyramidum* (Sindaco et al. 2013, Geniez 2015).

### Data deficient and unconfirmed Species

Some of species cited for the Algerian herpetofauna are classified in the Data Deficient category, while others should be noted as "unconfirmed", such as the Puff Adder *Bitis arietans* (Merrem, 1820), which is mentioned by some authors, but for which we have

found no bibliographical reference confirming its presence in Algeria. Identification difficulties also occur between taxonomically related species, this being the case of *Stenodactylus sthenodactylus* (Lichtenstein, 1823), which is indistinguishable from *Stenodactylus mauritanicus* Guichenot, 1850. Its presence in Algeria has only been reported in the south by Metallinou et al. (2012) in Oued Dider, Aguelmane Assar (Tassili n'Ajjer). Another rare species recorded from southern Algeria is the Egyptian Grass-loving lizard, *Philochortus zolii* (Scortecci, 1934). It was first recorded in May 1974, when T.J. Pappenfuss, R.C. Drewes and E.J. Morris collected two specimens (Scheinberg and Fong 2024), 3 km east of Tamanrasset on the road to Adriane. The specimens are currently at the California Academy of Sciences (CAS). This is a very rare species, which occur in small sub-populations. New observations were made recently in the Municipality of Tagmart-East, in the wilaya of Tamanrasset on 23 July 2023 by Haddad et al. (2024), confirming the presence of this species in Algeria. The Egyptian Catsnake *Telescopus obtusus* (Reuss, 1834) is a poorly-known species, little data exist on its distribution in Algeria; the only stations cited in the literature are located in Mertoutek (Ahaggar) and In-Sebuk Oua Mellen (Immidir), those populations in the mountains of southern Algeria being presumably isolated (Crochet et al. 2008). Another viper reported in Algeria is suspected of being part of the genus *Daboia*; it is, in fact, The Levant Viper *Macrovipera lebetinus* (Linnaeus, 1758). Specimens from northern Algeria and Tunisia, preserved for a long time in museums, have been attached to the subspecies *Macrovipera lebetinus transmediterranea* (Nilson & Andr n 1988). One of the few specific localities is Djebel Murdjajo near Oran in western Algeria. The validity of the taxa *M. l. transmediterranea* as full species is currently uncertain due to the scarcity of records along all of its supposed distribution (Jim nez Robles and del M rmol Mar n 2012). It is not impossible that the presence of *M. lebetinus* in North Africa results from introductions from Asia Minor during Antiquity (Mart nez-Freiria pers. comm. in Noura et al. (2022)). A new species has just been identified in the Algerian herpetofauna: The Saharan Sand Snake, *Psammophis aegyptius* Marx, 1958. This species, already described in south-eastern Algeria by Schleich et al. (1996) and in the Ahaggar by Trape and Man  (2006), was recently reported by Boulaouad A. on 21 December 2021 at In Guezzam (Tamanrasset), near the border with Niger (<https://www.inaturalist.org/observations/185341814>).

## Conservation strategy for Reptiles

Many reptiles are facing threats due to habitat degradation, but the current conservation measures are insufficient to address the critical concerns for their survival. The studies and reports on biodiversity in Algeria are focused on the fauna as a whole, without carrying out specific studies on the state of conservation of the herpetological communities and their habitats. Additionally, Algerian legislation does not offer total protection to those species and their habitat. Incentives and legislative measures must be established. Thus, the protection of Algerian reptiles requires a better knowledge of their ecology and distribution. The deficiencies of knowledge of their taxonomy, biology, dynamics and rate of evolution are significant. The status of several species remains to be defined. This lack of data limits the conservation of these species and makes their management quite difficult. Therefore, it

is fundamental to establish a national strategy for better knowledge and thus better conservation of this fauna.

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## Author contributions

R. Rouag - species identification, data preparation, manuscript editing.

N. Ziane - data preparation.

M. De Sousa - Software, data preparation, manuscript editing.

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