

An updated herpetofaunal inventory for some islets of South-Eastern Tunisia

Pietro Lo Cascio¹ & Vincent Rivière²

¹Associazione Nesos, via Vittorio Emanuele 24, 98055 Lipari, Italy; e-mail: plocascio@nesos.org

²AGIR écologique SARL 147, anc. route d'Esparron, 83470 Saint Maximim-La-Baume, France; e-mail: vincent.riviere@agirecologique.fr

ABSTRACT

The present paper provides the results of the herpetological investigations carried out on the satellite islets of Djerba and the Kneiss Archipelago, and an updated list of their herpetofauna. On the whole, the faunal assemblage of the eleven visited islets includes seven species of reptiles, whose richness seems to be related to the islet size. *Stenodactylus sthenodactylus* (Lichtenstein, 1823) and *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) are new records, respectively, for the Djerba satellites and the Kneiss Archipelago, while new localities were recorded for the previously known species.

KEY WORDS

Reptiles; faunal list; new records; Kneiss Archipelago; Djerba satellites; Tunisia.

Received 22.07.2016; accepted 29.08.2016; printed 30.09.2016

INTRODUCTION

The small coastal islands of Tunisia are largely uninhabited and have not undergone to a strong anthropization, therefore are generally characterized by a good level of preservation of their environmental characteristics and their biodiversity. However, their biological knowledge is often lacking (see Lo Cascio & Rivière, 2014).

During a scientific mission organized in 2015 April in the framework of the Mediterranean Small Islands Initiative PIM, an international program supported by the French Conservatoire du Littoral, dedicated to island conservation, we had the opportunity to carried out herpetological surveys on El Bessila, El Hajar, El Laboua, Gharbia North and Gharbia South, belonging to the Kneiss Archipelago, as well as on some satellites of Djerba, namely Dzira, El Gataïa el Bahria, El Gataïa el Gueblia, Jlij and two unnamed islets nearby to this latter that are hereafter indicated as Jlij 2 and Jlij 3.

Some of them have been previously investigated by Tlili (2003), Noura (2004), and Gobbaa (2012). The aim of the present paper is to update the faunal knowledge on both islets' groups, providing further records that also concern some islets so far unexplored.

MATERIAL AND METHODS

Study area

Localization of the study area is shown in figure 1, while the main geographical data of the islets are given in Table 1. All these islets have continental origin, are characterized by a flat morphology, with an altitude ranging from 1 to a maximum of < 10 m a.s.l., and lie into the isopleth of -10 m, hence their definitive isolation is dated back to historical times (see Oueslati, 1995). Both Kneiss and Djerba's islets fall within the arid bioclimatic belt, with an annual precipitation of about 200 mm.

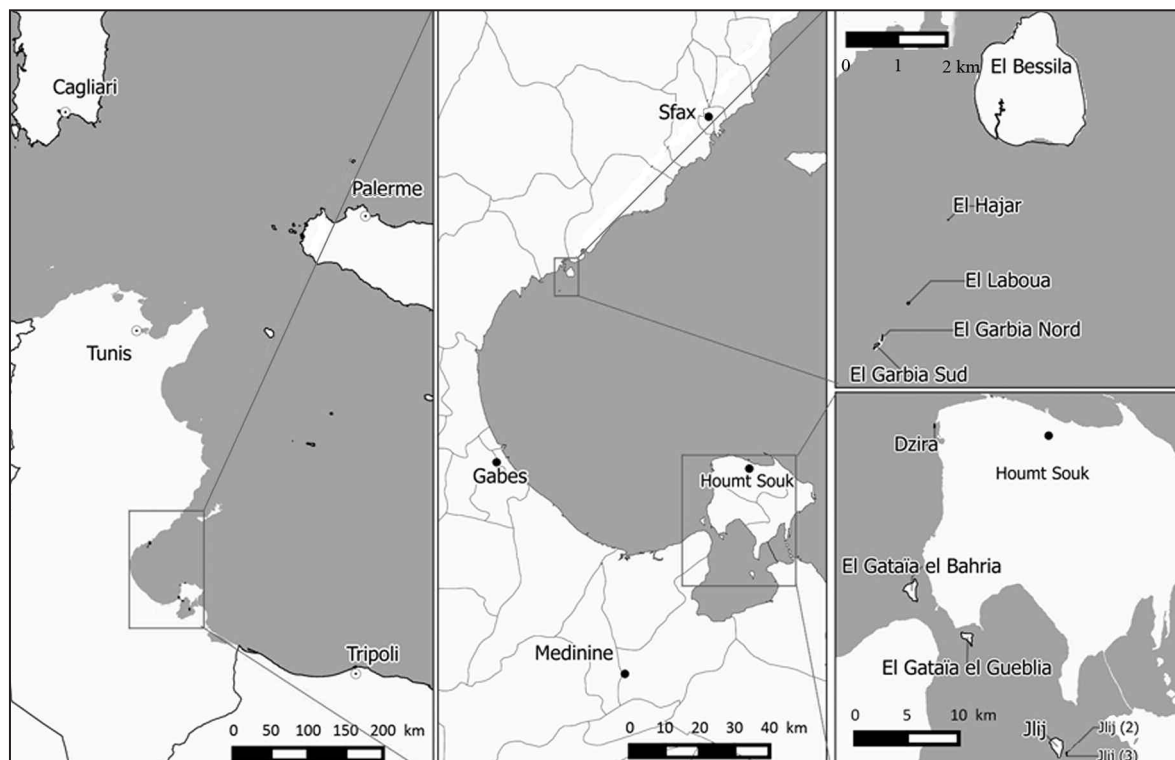


Figure 1. Geographical setting of the study area, South-Eastern Tunisia.

ISLAND	A	B	C	D
El Bessila	N 34.36639° E 10.31444°	436.24	3090	3
El Gharbia-North	N 34.32128° E 10.27646°	0.19	6480	1
El Gharbia-South	N 34.31999° E 10.27499°	0.53	6665	1
El Hajar	N 34.34277° E 10.29083°	0.01	4405	0
El Laboua	N 34.32749° E 10.28194°	0.22	5855	1
Dzira	N 33.87497° E 10.73973°	2.44	315	4
El Gataïa el Bahria	N 33.73222° E 10.71527°	153.21	1500	5
El Gataïa el Gueblia	N 33.69138° E 10.77388°	72.81	575	4
Jlij	N 33.59638° E 10.86722°	149.29	3090	4
Jlij 2	N 33.57909° E 10.86893°	1.43	5815	0
Jlij 3	N 33.57732° E 10.86966°	0.28	6055	0

Table 1. Geographical data of the study islands: A) geographical coordinates; B) surface (ha) (from initiative PIM Database); C) distance from main island/mainland (m); D) number of species.

The Kneiss Archipelago includes the tiny islets of El Hajar, El Laboua, Gharbia North and Gharbia South, and El Bessila which is the largest of the group. This latter is formed by sandy plains and dunes covered by sparse xeric grasslands of the *Lygeo-Stipetea*, and by a mosaic of sebkhas and chotts dominated by salt-marsh plant assemblages and intersected by tidal channel networks. The islet is still used for grazing and frequented by fishermen but without a permanent settlement. The other islets are mainly composed by sandstone and densely covered by halophile vegetation. Until recent times, El Laboua, Gharbia North and Gharbia South were forming a single island, where in 6th century A.D. was active a monastery (Troussset et al., 1992).

The satellites of Djerba, in alphabetical order, are Dzira, El Gataïa el Bahria, El Gataïa el Gueblia, Jlij, Jlij 2 and Jlij 3. All have a flat morphology and are formed by sandy and limestone outcrops, except for Jlij and the nearby islets which are exclusively sandy. The vegetation consists mostly in xero-thermophile and halophile steppe. The larger of the group, El Gataïa El Bahria, hosts an archaeological site with remains of tombs, while on El

Gataïa El Gueblia there are ruins of small fishing settlements and traces of a past agricultural exploitation.

Field work

Field work was done from 7 to 13 April 2015, spending from some hours to one day on each islet; El Bessila was also visited nocturnally. Visual encounter surveys have been carried out along linear transects or on the whole accessible surface of the smallest islets. Animals have also been actively searched by lifting stones and by checking their potential shelters. All the found specimens have been identified, photographed and successively released at the place of capture. Their identification was done using the keys given by Joger (1984), Szczerbak (1989), and Schleich et al. (1996).

Nomenclature and data analysis

The nomenclature follows Sindaco & Jeremčenko (2008) and Sindaco et al. (2013), except for the species formerly included in the genus *Mabuya* Fitzinger, 1826, that according to Bauer (2003) is here referred to *Trachylepis* Fitzinger, 1843. Faunal data analysis was assessed by using simple linear regression with 95% confidence limits and performed with the open source software PAST version 3.04.

RESULTS

Species list

PHYLLODACTYLIDAE

Tarentola cf. *mauritanica* (Linnaeus, 1758)

Previously recorded for El Gataïa El Bahria by Tlili (2003), although this locality has not been mentioned in the recent review of the Tunisian distribution of the genus *Tarentola* Gray, 1825 (Tlili et al., 2012a). The record for this islet was however confirmed by our observations, and the species was also found on El Gataïa El Gueblia and Dzira, where small populations occur usually in correspondence of vestiges, ruins and/or rocky outcrops. The lack of these microhabitats on Jlij, Jlij 2 and

Jlij 3 could explain its apparent absence on these islets.

REMARKS. The taxonomy of the *Tarentola* specimens from Djerba (and virtually from its satellites) is uncertain, and molecular investigations are still in progress (W. Tlili, pers. comun.). Joger (2003) found that they are morphologically very close to *T. mauritanica*, but affine to *T. deserti* Boulenger, 1891 from the results of electrophoretic analysis. Tlili (pers. comun. in Lo Cascio & Rivière, 2014) has supposed also their belonging to *T. fascicularis* (Daudin, 1802), while no data were given in the further papers by Joger & Bshaenia (2010), Tlili et al. (2012a) and Farjallah et al. (2013). Waiting for a definitive clarification of its status, the populations of the islets of Djerba are here referred to *Tarentola* cf. *mauritanica*.

GEKKONIDAE

Stenodactylus sthenodactylus (Lichtenstein, 1823)

Previously recorded for El Gataïa El Bahria by Tlili (2003), although this locality has not been successively mentioned by Tlili et al. (2012b). The species (Fig. 2) has not been detected on the islet during our survey, but several habitats seem to be potentially suitable for this gecko, which is characterized by nocturnal activity and elusive behavior. One specimen was instead found in a diurnal shelter at El Bessila, despite the nocturnal survey we performed. This observation represents the first record of the species for the Kneiss Archipelago. On this islet *S. sthenodactylus* seems however rare



Figure 2. A specimen of *Stenodactylus sthenodactylus* from El Bessila (Kneiss Archipelago).

and localized, as suggested by the lacking of further observations during a nocturnal prospection.

SCINCIDAE

Chalcides ocellatus (Forsskål, 1775)

Previously recorded for El Gataïa El Bahria by Gobbaa (2012), it has been found also on El Gataïa El Gueblia, Dzira and Jlij, as well as for El Laboua, El Gharbia North and El Gharbia South. It was known for Djerba (Escherich, 1896; Mertens, 1946; Parent, 1981; Tlili, 2003), while it is a new record for the Kneiss Archipelago.

Trachylepis vittata (Olivier, 1804)

Nouira (2004) has recorded this species (sub *Mabuya vittata*) for El Bessila and emphasized that it was also the first finding for the Tunisian islands, but the descriptive sheet given in this paper shows a photo of a specimen belonging to *Mesalina olivieri* (Audouin, 1829) (see Nouira, 2004: 4). Its occurrence on El Bessila is however confirmed from our observations.

LACERTIDAE

Acanthodactylus boskianus (Daudin, 1802)

Previously recorded for El Gataïa El Bahria and El Gataïa El Gueblia by Tlili (2003) and for Jlij by Gobbaa (2012), it has been found also on Dzira. We can also confirm the record for El Bessila given by Nouira (2004).

Mesalina olivieri (Audouin, 1829)

Previously recorded for El Gataïa El Bahria by Tlili (2003), it has been found also on El Gataïa El Gueblia, Dzira and Jlij.

LAMPROPHIIDAE

Malpolon insignitus (Geoffroy Saint-Hilaire, 1827)

New record for Jlij. The species was previously known for Djerba (Parent, 1981; Tlili, 2003). We

can confirm also the record for El Bessila given by Nouira (2004).

DISCUSSION

Two species, *Malpolon insignitus* and *Stenodactylus sthenodactylus*, are new records for the satellites of Djerba and the Kneiss Archipelago, respectively, while for other four species (*Tarentola* cf. *mauritanica*, *Chalcides ocellatus*, *Acanthodactylus boskianus* and *Mesalina olivieri*) new localities within the study area are given. Our observations also allow to confirm all the previous records given in literature, with the only exception of *S. sthenodactylus* for El Gataïa El Bahria, where however its occurrence cannot be excluded.

The Djerba satellites and the Kneiss Archipelago harbor respectively six and five species of reptiles, while no amphibians occur on both groups.

Comparing their faunal assemblages, *Mesalina olivieri* is a distinctive species of the Djerba satellites, but its absence from the Kneiss appears difficult to explain and is probably related to ecological constraints, considering that the Olivier's lizard is widely distributed and rather common both in continental and insular areas of Tunisia (Blanc, 1980).

Conversely, the largest islet of Kneiss, El Bessila, is inhabited by *Trachylepis vittata* that was not recorded for the Djerba satellites, as well as for the main island, although it occurs on other coastal islands (such as Kuriat and Kerkennah: see Lo Cascio & Rivière, 2014; Corti et al., 2015) and in several continental localities, including the southern Tunisia (Mayet, 1903; Kalboussi & Nouira, 2004).

On the basis of these updated information and those given in literature for Djerba and Kuriat (Tlili, 2003 and references therein; Lo Cascio & Rivière, 2014), the analysis of the herpetofauna by using a simple linear regression has shown a highly significant correlation between log N species and log area ($r = 0.899$, $P = 0.0001$) (Fig. 3). Species richness of the coastal Tunisian islets seems therefore mostly influenced by the island size, as also indirectly confirmed by the absence of herpetofauna on Jlij 2, Jlij 3 and El Hajar which are, respectively, the smaller of the Djerba and Kneiss groups. Among them, the relatively high number of species found on the tiny islet of Dzira could be justified by its closeness to the main island, as well as by its

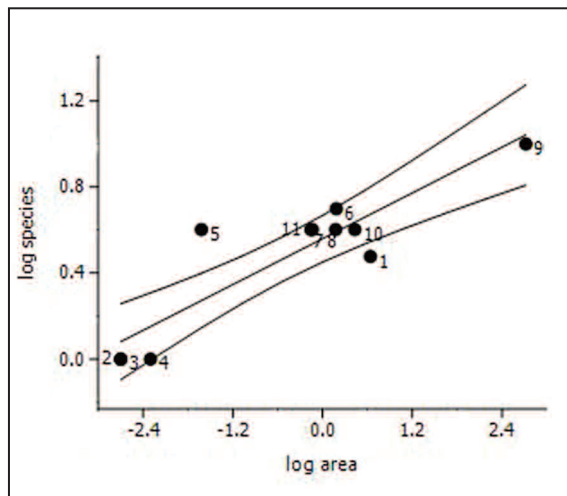


Figure 3. Species-area plot (log species - log area) of the herpetofauna of some Tunisian coastal islands. Numbers are as follows: 1) El Bessila, 2) El Laboua, 3) El Gharbia North, 4) El Gharbia South, 5) Dzira, 6) El Gataïa el Bahria, 7) El Gataïa el Gueblia, 8) Jlij, 9) Djerba, 10) Great Kuriat, 11) Small Kuriat.

environmental heterogeneity, determined by the occurrence of limestone and sandy areas together with some rocky outcrops.

None of the species occurring on both islet groups is listed among the threatened taxa of the Red List by IUCN (www.iucnredlist.org) or seems to be characterized by particular conservation problems at regional and local levels. However, it should be emphasized the importance of safeguarding and maintenance of the reptile populations that represent the most significant component of the terrestrial vertebrate fauna in these insular environments, and that could suffer any small disturbance or environmental alteration in these fragile ecosystems.

ACKNOWLEDGEMENTS

We would like to sincerely thank the participants to the PIM mission on Djerba and Kneiss, Sami Ben Haj, Mohammed Chaïeb, Ludovic Charrier, Mathieu Charrier, Anis Zarrouk, Frédéric Médail, Ridha Ouni and Philippe Ponel, for their invaluable help during the field work; the colleague Wided Tlili, for the useful information; the Agence de Protection et d'Aménagement du Littoral (APAL), and especially Morsi Feki and Anis

Zarrouk, for given us the logistical support; all the team PIM, for their interest in the knowledge and conservation of the small islands of the Mediterranean.

REFERENCES

- Bauer A.M., 2003. On the identity of *Lacerta punctata* Linnaeus, 1758, the type species of the genus *Euprepis* Wagler, 1830, and the generic assignment of the Afro-Malagasy skinks. *African Journal of Herpetology*, 52: 1–7.
- Blanc C., 1980. Notes sur les reptiles de Tunisie. VI. Observations sur la morphologie et les biotopes de *Mesalina* (Reptilia: Lacertidae). *Compte rendu de séances de la Société de Biogéographie*, 491: 53–61.
- Corti C., Lo Cascio P., Ben Haj S., Nouira S., Ouni R. & Rivière V., 2015. Update on the herpetofauna of the islands of East Tunisia. In: Poulakakis N., Antoniou A., Karameta E., Psonis N. & Vardinoyannis K. (Eds.). *Abstracts of the International Congress on the Zoogeography and Ecology of Greece and Adjacent Regions, 13th ICZEGAR (Irakleio 7–11 October 2015)*. Hellenic Zoological Society, Irakleio, 105.
- Escherich C., 1896. Beitrag zur Fauna der tunisischen Insel Djerba. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien*, 46: 268–279.
- Farjallah S., Amor N., Gharbi R. & Said K., 2013. Relationships of the Moorish gecko *Tarentola mauritanica* sensu lato (Reptilia, Phyllodactylidae) populations in Tunisia: morphological and karyological assessment. *Annales Zoologici*, 63: 149–156.
- Gobbaa I., 2012. Variabilité morphologique du Lézard *Acanthodactylus boskianus* habitant les îlots de la lagune de Boughrara. *Mastère de Recherche, Université de Gabes, Faculté des Sciences*, 44 pp. (unpublished document)
- Joger U., 1984. Taxonomische revision der Gattung *Tarentola* (Reptilia: Gekkonidae). *Bonner zoologische Beiträge*, 35: 129–174.
- Joger U., 2003. Reptiles and amphibians of southern Tunisia. *Kaupia, Darmstädter Beiträge zur Naturgeschichte*, 12: 71–88.
- Joger U. & Bshaenia I., 2010. A new *Tarentola* subspecies (Reptilia: Gekkonidae) endemic to Tunisia. *Bonn zoological Bulletin*, 57: 267–274.
- Kalboussi M. & Nouira S., 2004. Régime alimentaire de *Mabuya vittata* (Olivier, 1804) (Reptilia: Scincidae) en Tunisie. *Bulletin de la Société herpétologique de France*, 109: 43–50.
- Lo Cascio P. & Rivière V., 2014. Herpetofaunal inventory of Kuriat and Jbel islands (Tunisia). *Biodiversity Journal*, 5: 391–396.

- Mayet V., 1903. Catalogue raisonné des Reptiles et Batraciens de la Tunisie. Exploration Scientifique de la Tunisie: Zoologie, Reptiles et Batraciens. Imprimerie Nationale, Paris, 32 pp.
- Mertens R., 1943. Zoologische Sammeltage auf Djerba, der Insel der Lotophagen. *Natur und Volk*, 73: 68–76.
- Nouira S., 2004. Biodiversité et statut écologique des scorpions et reptiles des îles Kneiss. Projet de préservation de la biodiversité dans la Réserve Naturelle des Iles Kneiss. GEF-UNDP, 8 pp. (unpublished document, available at <http://www.initiative-pim.org/en/node/47184>)
- Oueslati A., 1995. Les Îles de la Tunisie. Paysages et milieu naturels : genèse, évolution et aptitudes à l'aménagement d'après les repères de la géomorphologie, de l'archéologie et de l'occupation humaine récente. Série Géographique n. 10, SERST-CEREST-Université de Tunis, Tunis, 368 pp.
- Parent G.H., 1981. Quelques observations écologiques sur l'herpétofaune de l'île de Djerba. *Les Naturalistes belges*, 62: 122–150.
- Schleich H.H., Kästle W. & Kabisch K., 1996. Amphibians and Reptiles of North Africa. Koeltz Scientific Publisher, Koenigstein, 627 pp.
- Sindaco R. & Jeremčenko V.K., 2008. The Reptiles of the Western Palearctic. 1. Annotated checklist and distributional atlas of the turtles, crocodiles, amphibians, and lizards of Europe, North Africa, Middle East and Central Asia. SHI-Belvedere, Latina, 579 pp.
- Sindaco R., Venchi A. & Grieco C., 2013. The Reptiles of the Western Palearctic. 2. Annotated checklist and distributional atlas of the snakes of Europe, North Africa, Middle East and Central Asia, with an update to the Vol. 1. SHI-Belvedere, Latina, 543 pp.
- Szczerbak N.N., 1989. Catalogue of the African Sand Lizards (Reptilia: Sauria: Eremiainae: *Lampreremias*, *Pseuderemias*, *Taeniaeremias*, *Mesalina*, *Meroles*). *Herpetozoa*, 1: 119–132.
- Tlili W., 2003. Biodiversité de l'herpétofaune insulaire tunisienne. Diplôme d'études approfondies en Ecologie générale, Faculté des Sciences de Tunis, Université de Tunis El Manar, 94 pp. (unpublished document)
- Tlili W., Delaugerre M., Ouni R. & Nouira S., 2012a. Distributional review of the genus *Tarentola* (Reptilia, Sauria) in Tunisia (North Africa). *Herpetology Notes*, 5: 485–492.
- Tlili W., Ouni R. & Nouira S., 2012b. New distribution records of the genus *Stenodactylus* (Reptilia, Sauria) in Tunisia (North Africa). *Herpetology Notes*, 5: 413–418.
- Trousset P., Slim H., Paskoff R. & Oueslati A., 1992. Les îles Kneiss et le monastère de Fulgence de Ruspe. *Antiquités africaines*, 28: 223–247.