

**Survey of reptiles in and around St. Katherine, Sinai
Peninsula, Egypt, 2011**



Elegant gecko (*Stenodactylus sthenodactylus*), Wadi Al-jofa (Photo: V.Deepak)

Operation Wallacea report-2011

By V. Deepak

INTRODUCTION

The Egyptian fauna has been documented and investigated for a long time, probably longer than any other fauna in the world; herpetofauna received special attention by the ancient Egyptians (Baha el Din, 2006). The Ancient Egyptians depicted many reptile species such as the horned viper (*Cerastes cerastes*), cobras (*Naja sp.*), Nile crocodile (*Crocodylus niloticus*) or the recently resurrected *Crocodylus suchus* (Hekkala *et al.*, 2011) and the Dabb lizards (*Uromastyx sp.*) (Baha el Din, 2006). There are 118 known species in Egypt, composed of one species of crocodile, one species of tortoise, seven species of turtles, nine species of amphibians, 39 snakes and 61 lizards (Baha el Din, 2006). The lower Nile valley and the margins of the delta is one of the species rich (39-53 species) areas in Egypt which is followed by the Gebel Elba region in the eastern desert and the high mountains South Sinai which has 36 species.

Southern Sinai has predominantly mountainous environments consisting of drainage systems made up of a number of connected Wadis (ephemeral river beds). Geologically the peninsula is split into three sections: the northern sand dunes, a central limestone plateau, and high altitude igneous rock mountains in the south. Southern Sinai lies in the North African belt and has a Saharan-Mediterranean climate. During summer the mean temperature of a day is 36° C (August) and in winter it gets cooler with a mean minimum temperature of 7.8 ° C (February) (White *et al.*, 2007). The area has an arid climate with mean annual rainfall of 60 mm/year with the addition of snow melt on higher mountain peaks, which can receive around 300 mm/ year (Grainger, 2003). These extreme arid conditions without any natural perennial water source or any true oasis are probably the reason none of the amphibians are found in south Sinai. However the high mountains of south Sinai is an abode for many reptile species including the endemic Mount Sinai gecko (*Hemidactylus mindiae*).

Most of the reptiles of South Sinai are considered as locally abundant and common. However Baha el Din (2006) points out that many of them are threatened by vehicular traffic and collection for pet trade. Two of the large herbivorous lizards *Uromastyx aegyptia* & *Uromastyx ornata* are classified as near threatened species by IUCN (2005) due to collection for pet trade and particularly trade of *Uromastyx ornata* originates within the protected areas

which encompass most of its distribution range (Baha el Din, 2006).

METHODOLOGY

Day transects

Four individuals walked with distanced 2 m away from each other for 1 km. Two observers on the extreme end used a stick to disturb bushes to find hidden lizards. Details of the habitat type, species, GPS co-ordinate, time of sighting was recorded for each individual. The surveys were carried out between 08.00 – 10.30 h. Distance of the transects were calculated using the trip odometer option in the GPS. The habitat types were categorized into five types viz; shrub dominated sand dunes, gravel plains, gravel mounds, rocky outcrops and sand stone formation. These are associated habitats of the two broad habitats classified as Wadis and mountains and gravel plains in reptile habitats section.

Night transects

Four individuals walked with distanced 2 m away from each other for 1 km. All individuals used a head-lamp or flash light during the search. Details of the habitat type, species, GPS co-ordinate, time of sighting was recorded for each individual. Surveys were carried out between 09.00 – 10.30 h.

Opportunistic sampling

Areas around the camp sites were checked for reptiles and recorded, individual animals crossing jeep tracks or on the jeep tracks while moving from one site to another were recorded. Photo records of reptiles from other team members (surveying plants, bats and birds) were checked and location details were gathered.

Identification

Standard identification key (Baha el Din, 2006) was used to identify species. Most individuals were captured and keyed to species level.

Reptile habitats and sampling sites description

Reptile habitats

Baha El Din (2006) gives a broad description on the herpetofaunal habitats of Egypt and their characteristic herpetofauna. We came across two of the herpetofaunal habitat described: Wadis and Mountains which are characteristic of the mountains of Southern Sinai and gravel plains although considered to hold poor herpetofauna (Baha El Din, 2006), it had few interesting species like the *Stenodactylus sthenodactylus*, *Trapelus pallidus* and *Uromastyx aegyptia*. During this survey we found out that *Trapelus pallidus* was the most common lizards in this habitat. Mountain regions and the associated habitats hold herpetofaunal elements not found elsewhere in Egypt (Baha El Din, 2006). Figure. 1 shows different habitats during the first survey.

Sampling sites

The first, third and fourth survey was carried out in the northern border of St. Katherine protectorate in elevations above 1100 m, the second survey was carried out in South-Eastern parts of the protectorate in elevations below 900 m.

Survey 1

Site 1: Wadi al-jofa

Wadi al-jofa was dominated by *Zilla spinosa* scrubs interspersed with sand dunes. It also had plains with gravel sands and small areas with sand stone formations. Green valley near al-jofa had date palms, and scrub with sand dunes and on both the sides of the dunes there were mountains with lava rocks which were usually straight. Glyabin Wadi al-jofa had a sand stone hill surrounded by gravel plain and sand dunes.

Figure 1. Habitats sampled for reptiles A. Pallid agama's habitat (gravel plains and mounds), B. Sinai agama, Starred agama and Dabb lizard habitat (rocky outcrop or volcanic rocks), C. Bosc's lizards and elegant geckos habitat (Shrub dominated dunes and gravel plains), D. Dabb lizard and the Natter's pigmy gecko habitat sandstone formations. Photo Credit: V. Deepak.



Site 2: Abo mogheirat

Wadi Al eluelajramia is a wide and long plateau with no sand dunes, the sand were mostly gravel interspersed with sand stone formations. The extreme ends of the plateaus had lava rock mountains with sharp edged rocks.

Survey 2

Wadi Nasb, Wadi Rahab, Wadi Zagahara and Wadi Shitan were the four sites surveyed during the second survey. Wadi Nasb was a narrow valley with steep sided mountains; the Wadi had a mix of gravel and rocks with or without shrubs. Wadi Rahab had one big sandstone formation; the ground was covered with gravel rock, shrub and some snags of Acacia trees. In Wadi Zagahara the places surveyed for reptiles were between 500-400 m elevations, the terrain was a mix of gravel plains and rocks with or without shrub. A small stretch of Wadi Shitan was sampled for reptiles, at the end of the Wadi there was a small dry waterfall and tanks had been built in the past to store water. The substrate was mostly gravel with large rock boulders and mountains on either side of the Wadi.

Survey 3

Wadi sahab (Abu talib) and wadi solat were surveyed only for diurnal reptiles. The habitat was similar to that of wadi al-jofa. Sand dune plains were dominated by shrubs and there were gravel plains, gravel mounds and rocky outcrops.

Survey 4

Wadi hibashi, Wadi Zagahara and Blue valley were also surveyed only for diurnal reptiles. This site had many hills mostly formed of crumbly granite rocks which were interspersed with small wadi's.

Other camp sites surveyed

“Fox camp” is located near St. Katherine, it is surrounded by mountains with loose soil, gravel and rock. It has a garden with olive trees and few grass species. “Nuweiba camp” is located close to the Nuweiba port on the coast of Red Sea. The site has no vegetation, the sea shore is rocky.

RESULTS

A total of 18 species of reptiles were recorded during the survey of 2011. It includes three species of snakes (Fig. 2), five species of agamids (Fig. 3), six species of geckos (Fig. 4), three species of lacertids (Fig. 5) and one species of skink (Fig. 5)

Survey 1

In the first two sites samples Wadi aljofa (plateau) and Abomogherirat (plateau) a total of 10 species were recorded during the nine days of sampling (Fig. 6). It includes one species of snake, three species of geckos, four species of agamids and two species of lacertids.

Day transects

A total of 54 lizards and one snake was found in the 10 transects sampled. Detection of individuals in the transects ranged between one individual to 14 individuals per transect. Only one transect out of the ten we did not find any reptiles. *Acanthodactylus bosikanus* was the most abundant lizards found in the day transects, they summed up to 32 individuals and 50 % of these individuals were juveniles or hatchlings. Twenty nine out of the thirty two *A. bosikanus* were found in scrub & sand dunes and only three were found in gravel plains which show their association with the vegetated Wadis. Eight individuals of *Pseudotrapelus sinaitus* and eight individuals of *Trapelus pallidus* summed up for the other 16 individuals in the transects. While the former was found only on the rocky outcrops and rocks the latter were found in gravel plains, scrubs in gravel plains and rocks. Six individuals of *Mesalina bahaeldini* were found mostly in the habitats where *A. bosikanus* was found and also on gravel mounds. The only snake found in the day transects was *Psammophis schokari* was found in a dry shrub on a gravel mound.

Figure 2. Snakes found in the survey: A. Burton's carpet viper (*Echis corotatus*), B. Sand viper (*Cerastes vipera*), C. Schokar's sand snake (*Psammophis schokari*). Photo Credit: (A) Adele Julier, (B & C) V. Deepak, (C insert picture) Amy Voong. Note: Pictures not to scale



Figure 3. Agamids found during the surveys are: A. Ornate dabb lizard (*Uromastyx ornata*), B. Egyptian dabb lizard (*Uromastyx aegyptia*), C. Sinai agama (*Pseudotrapelus sinaitus*), D. Starred agama (*Laudakia stellio*), E. Sinai agama (complex) (*Pseudotrapelus cf. sinaitus*), F. Pallid agama (*Trapeleus pallidus*). Photo Credit: V. Deepak. Note: Pictures not to scale.



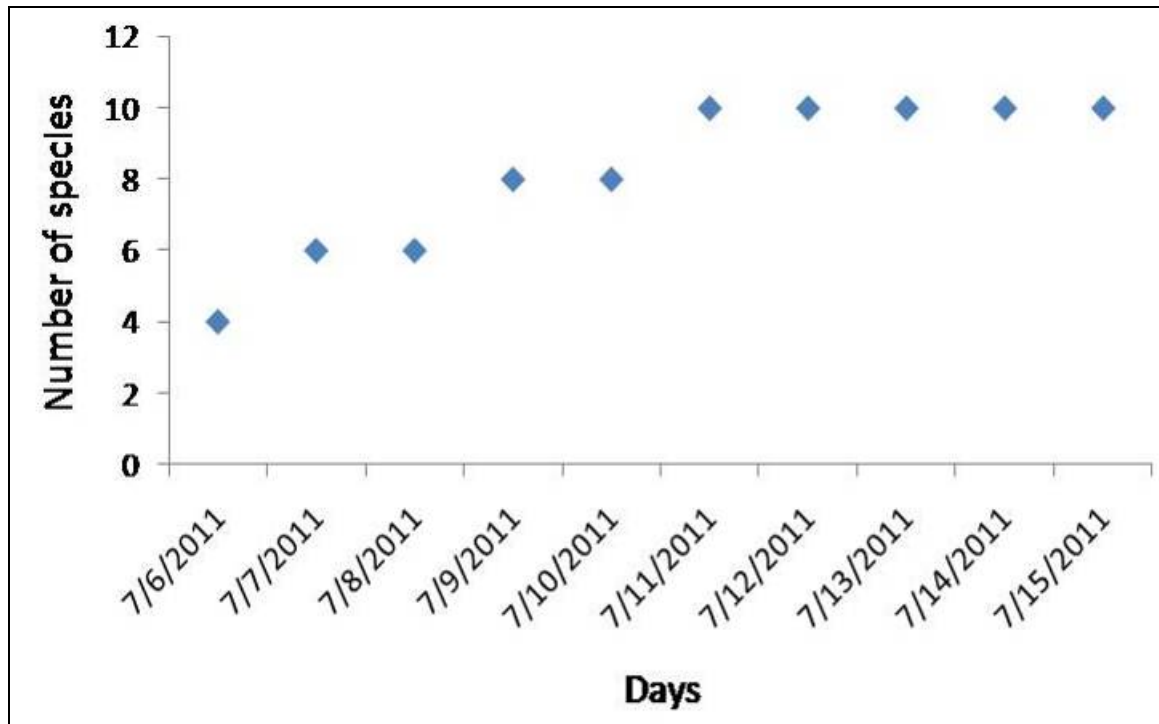
Figure 4. Geckonids found during the surveys are: A. Egyptian fan-toed gecko (*Ptyodactylus hasselquistii*), B. Spotted fan-toed gecko (*Ptyodactylus guttatus*), C. Mt. Sinai gecko (*Hemidactylus mindiae*), D. Natterer's pigmy gecko (*Tropicolotes nattereri*), E. Elegant gecko (*Stenodactylus sthenodactylus*), F. Rough tailed gecko (*Cryptopodion scabrum*). Photo Credit: V. Deepak. Note: Pictures not to scale



Figure 5. Lacerids and scincids recored: A. Bosc's lizard (*Acanthodactylus boskianus*), B. Bahaeldin's lizard (*Mesalina bahaeldini*), C. Small spotted lizard (*Mesalina guttatus*), D. Ocellated skink (*Chalcides ocellatus*). Photo Credit: V. Deepak. Note: Pictures not to scale



Figure 6. Number of reptile species recorded during the first nine days of sampling. Data pooled from day & night transects and opportunistic search.



Night transects

Only three out of the 10 night transects we found reptiles. Three species of geckos were found of which one of them the *Ptyodactylus guttatus* was diurno-nocturnal and were found on rocky outcrops and sandstone formation. The other two gecko species *Stenodactylus sthenodactylus* and *Tropicolotes nattreri* are nocturnal, the former was found in dunes and gravel plains and the later on a sandstone crevice.

Opportunistic sampling

Twelve species of lizards including the seven species found during the day and night transects were found during opportunistic sampling. *Mesalina guttatus*, *Laudakia stellio* and

Uromastix aegyptia were the lizards found. *Echis coloratus* was an additional snake to the opportunistic record.

Survey 2

Five species of lizards and one species of snake was found during the three day and 2 night sampling. *Ptyodactylus hasselquistii* was the common gecko encountered in this site, total of 23 individuals were recorded.

Day transects

Four individual lizards were recorded in the three day transects. Two of them were *Acanthodactylus boskianus* and the remaining two were *Pseudotrapelus cf. sinaitus*.

Night transects

Five individuals were recorded in one out of the two transect and all the five are *Ptyodactylus hasselquistii*.

Opportunistic sampling

Additional records of *Acanthodactylus boskianus* and *Ptyodactylus hasselquistii* were documented. *Uromastix ornata* and *Cerastes vipera* are additional species found opportunistically.

Survey 3

Day transects

Two transects were sampled in Wadi Abu Talib (Sahab) and in Wadi Solaf. Eleven individual lizards were encountered in these transect of which nine of them were *Acanthodactylus boskianus* and the remaining three were *Pseudotrapelus sinaitus*.

Survey 4

Day transects

Three transects were sampled in three different Wadi's, one in each. Nineteen individual lizards were encountered in the three transects of which seventeen of them were *Acanthodactylus boskianus* and one of them was *Mesalina bahaeldini*.

Opportunistic records from fox camp and Nuweiba camp

Around Fox camp we recorded *Laudakia stellio*, *Acanthodactylus boskianus*, *Hemidactylus mindiae*, *Pseudotracheleus sinaitus*, *Mesalina bahaeldini* and *Ptyodactylus guttatus* and in and around Nuweiba camp we found *Ptyodactylus hasselquistii* and *Cryptopodion scabrum*.

DISCUSSION

Eighteen species of reptiles were found during the survey. Each species used distinct microhabitats and the diversity reptile in different survey sites were probably resulting from the matrix of microhabitats in a given site. The similarity in reptilian diversity in different survey sites is probably due to the proximity of the sites and also the elevation at which they were found. Species belonging to genus *Uromastyx*, *Ptyodactylus*, *Pseudotracheleus* found in the low elevations below 1000 m have their ecological congeners found in elevations above 1000 m. Although *Pseudotracheleus sinaitus* is considered as a monotypic genus, they are considered as a complex. During this survey we came across one such morpho species (Fig 3 E), they had the Genus characters but not the species. While *Uromastyx aegyptia* is found in the high mountains of Sinai > 1000 m *Uromastyx ornate* are found < 1000 m elevations in the vegetated parts of drier low elevations. *Ptyodactylus guttatus* gecko are found mostly in the rocky patches of the high mountains and *Ptyodactylus hasselquistii* are found in the rocky habitats in low elevations interestingly there are places where they both co-occur.

Both diurnal and nocturnal surveys yielded in 18 species of reptiles in a short duration. Spending at least four to five days in a survey site can yield more species detection (Appendix.1) Multiple repeats of diurnal and nocturnal surveys in different habitats can

provide sufficient samples to analyze and estimate their populations.

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Appendix 1. Overall sampling effort and number of species and individuals found during the survey.

Sampling location	No. of days spent	No. of species found	No. of individuals found
Survey 1: Wadi Al-jofa, Glyab & Green Valley	5	10	22
Survey 1: Abo mogheirat, Wadi omjrfa & Al-elu eljaramia	5	9	62
Survey 2: Wadi Nasb, Wadi Rahab, Wadi Zagahara	3	5	36
Survey 3: Wadi Abu Talib (Sahab) & sohab	1	3	11
Survey 4: Hibashi, Wadi zahag & Blue valley	2	3	21
Other sites: Nuweiba camp & Fox camp	6	4	6
		Total	158