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A survey of the herpetofuna was conducted as part of a general biota survey of the Sudan. Sudan, with its vast territory, diverse climate, ecosystems, and habitats, is expected to have large variation in herpetofuna. In the current study investigation of lizards and geckos diversity has been conducted. During the current survey fourteen species were encountered including one species not previously documented. Family Agamidae is represented by three species *Agama spinosa*, *Uromastyxocellata* and *Pseudotrapelussinaitus*. Eight species from the family Gekkonidae were recorded, these included *Tropicolotes steudneri*, *Ptyodactylus* sp., *Tarentola annularis*, *Stenodactylus thenodactylus*, *Hemidactylus* sp., *Hemidactylus robustus*, *Ptyodactylus ragazzii* and *Cyrtopodion scabrum*. The family Lacertidae is represented by two species, *Acanthodactylus boskianus* and a new record in Sudan of *Mesalinaguttulata*. Family Scincidae is represented by two species *Trachylepis quinquetaeniata* and *Chalcidescellatus humilis*.

Investigation of the Herpetofauna of Sudan

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Abstract

A survey of the herpetofuna was conducted as part of a general biota survey of the Sudan. Sudan, with its vast territory, diverse climate, ecosystems, and habitats, is expected to have large variation in herpetofuna. In the current study investigation of lizards and geckos diversity has been conducted.

During the current survey fourteen species were encountered including one species not previously documented. Family Agamidae is represented by three species *Agama spinosa*, *Uromastix ocellata* and *Pseudotrapelus sinaitus*. Eight species from the family Gekkonidae were recorded, these included *Tropiocolotes steudneri*, *Ptyodactylus* sp., *Tarentola annularis*, *Stenodactylus sthenodactylus*, *Hemidactylus* sp, *Hemidactylus robustus*, *Ptyodactylus ragazzii* and *Cyrtopodion scabrum*. The family Lacertidae is represented by two species, *Acanthodactylus boskianus* and a new record in Sudan of *Mesalina guttulata*. Family Scincidae is represented by two species *Trachylepis quinquetaeniata* and *Chalcides ocellatus humilis*.

Key words: Sudan, Biodiversity, Herpetofauna, Geckos, Lizards.

1. Introduction:

Reptiles like snakes, lizards, crocodiles, turtles and tortoises, are found throughout the warmer parts of the world and they thrive in numerous habitats from open sea, deserts, rainforest and even underground. Understanding the herpetofauna is an important part of documenting the biodiversity of regions. Preservation of necessary habitat in natural areas is one important step in species conservation and management. Unfortunately, very few studies of reptiles in Sudan were

done. Previous herpetofuna survey for the Sudan was conducted in 1983 by Nimirwho reported about 90 species of reptiles in Sudan. Hillman (1982) made a review of wildlife in Southern Sudan, reporting information on 83 species and 19 conservation areas. New investigations on the herpetofauna of the Red Sea Hills of Sudan were done by Johannes Muller *et al.* (2011). More research is needed to be done in Sudan to assess the herpetofuna including richness, diversity and abundance. The present survey is conducted for the

purpose of updating the species composition of the herpetofauna in different locations in Sudan.

In this paper, we provide a preliminary investigation of the biodiversity of different species of reptiles. The goal is to provide a solid base of knowledge in order to guide management and conservation efforts taking place in different sites in Sudan.

2. Materials and methods:

Ten locations in eight states were selected for reptile sampling; each representing different habitat in the Sudan (figure 1). Locations were Red Sea State represented by Port-Sudan, Arkawit area and Dongonab Bay Islands (figure 2 and plate 1 (A and B)). River Nile State represented by El Muswwarat area (plate 2), Khartoum State represented by Khartoum locality, Shambat (Khartoum North locality) and Tuti Island, Gezira State represented by Wad Madani and Rufaa localities, Gedarif State represented by Doka and Kassala State was represented by New Halfa (Plate 3) and Elsawagi of Kassala city (Plate 4 A and B).

Herpetofunal surveys were conducted from June 2010 to June 2013. Specimens were caught by hand during the day and night periods. Specimens were photographed and identified (Plate 5) according Baha El Din (2006).

3. Results:

Fourteen species of reptiles belonging to four families Agamidae, Gekkonidae, Lacertidae, and Scincidae were recognized. Family Agamidae was represented by three species *Pseudotrapelussinaitus*, *Uromastyxocellata* and *Agama spinosa*. While Gekkonidae was represented by eight species namely: *Tropicolotes steudneri*, *Ptyodactylus sp.*, *Tarentola annularis*, *Stenodactylus thenodactylus*, *Hemidactylus sp.*, *Hemidactylus robustus*, *Ptyodactylus ragazzii* and *Cyrtopodion scabrum*. Family Lacertidae was represented by two species, *Acanthodactylus boskianus* and *Messalina guttulata* and family Scincidae was represented by two species, *Trachylepis quinquetaeniata* and *Chalcides ocellatus humilis* (Table 1, Plate 5 A and B).



Figure (1): map of Sudan showing the various locations of the study areas indicated by the Red arrows.

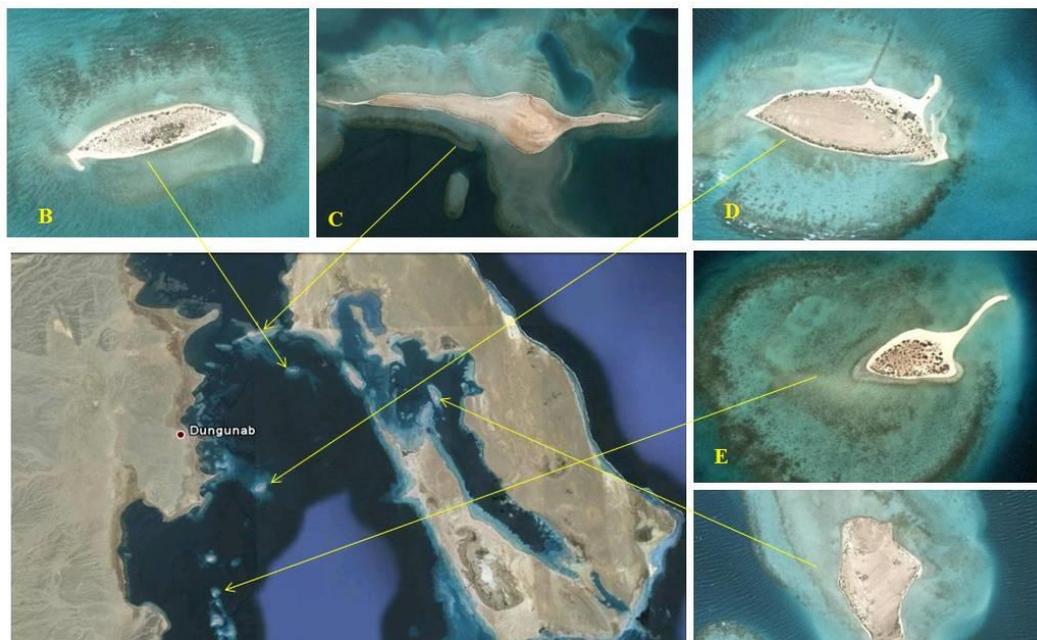


Figure (2): (A, B, C, D, E and F) satellite images showing Dongonab Bay and some of the islands visited to survey the reptiles. (A): the Dungonab Bay., (B): Alaeigh Island., (C): Um Tarda Island., (D): Um Elsheikh Island., (E): Sa'ad Allah Island. (F): Shagal Island.

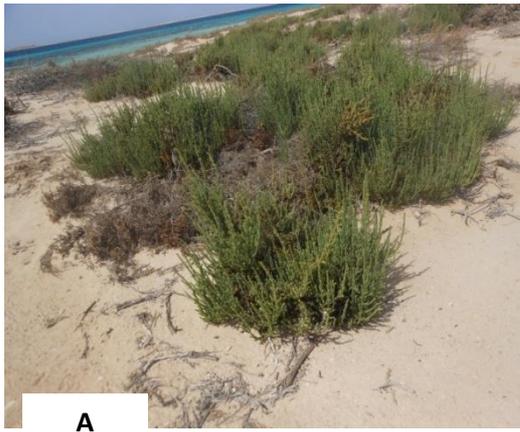
**A****B**

Plate 1 :(A): Sa'ad Allah Island on the Sudanese Red Sea coast, (B): Garden in the Faculty of Marine biology, Red Sea University, Port Sudan,



Plate (2): El Muswwarat area, semi desert habitat



Plate (3): New Halfa, dry habitats

**A****B**

Plate 4(A): Kassala state collection areas, rocky habitat, (B): Kassala state collection area, agricultural land



Family: Gekkonidae
Tropicolotes steudneri



Family: Gekkonidae
Ptyodactylus sp.



Family: Gekkonidae
Ptyodactylus sp.



Family: Agamidae
Pseudotrapelus sinaitus



Family: Lacertidae
Acanthodactylus boskianus



Family: Scincidae
Trachylepis quinquetaeniata



Family: Gekkonidae
Hemidactylus



Family: Gekkonidae
Stenodactylus sthenodactylus



Family: Gekkonidae
Tarentola annularis



Family: Gekkonidae
Tarentola annularis



Family: Gekkonidae
Tarentola annularis



Family: Gekkonidae
Cyrtopodion scabrum



Family: Scincidae
Chalcideso cellatus humilis



Family: Lacertidae
Mesalina guttulata



Family: Gekkonidae
Hemidactylus robustus



Family: Gekkonidae
Ptyodactylus ragazzii



Family: Agamidae
Agama spinosa



Family: Agamidae
Uromastyx ocellata

Plate 5 (B) Herpetofauna survey from different localities in 6 states

4. Discussion

There are no popular identification guides to reptiles in Sudan and no checklist is available, also published work about reptiles is poor. This makes it relatively difficult for the amateur to develop expertise in the subject and to record species in a reliable and useful manner. This paper is offered in the hope that it will assist standardization in the study of herpetology in Sudan. Nimir (1983) reported about 90 species of reptiles in the Sudan; unfortunately, a lack of historical data on the diversity of reptiles in the Sudan, and lack of proper records make comparisons difficult. This study aimed to identify the species of reptiles in various regions in Sudan. During this study several new additions to the herpetofunal community of the Sudan were recorded. In general, it can be assumed that many of the records in this study are new for the collection areas and therefore represent reptile range extension. The various genera and species are adapted to wide ranges of environments and a large number of forms are found in dry or even desert conditions.

Reptiles were classified into 12 species belong to 4 different families. The result indicate that El- Muswwarat showed highest diversity compared to other sites (Table1) and that may be attribute to the habitats diversity like rocky habitats, semi desert, sandy, grassy, and the valleys.

5. Conclusions

The study aimed to assess the composition and diversity of some species of reptiles in various locations in the Sudan. The field trips to various locations in the Sudan revealed different and new reptile species records for the country, emphasizing the poor knowledge of the biodiversity in these areas.

This study makes an important addition to the previous surveys made by Muller *et al.*, (2011). It reported twelve species of geckos and lizards representing four families of reptiles in the studied areas.

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