

Ants of the Sudan: Formicidae of El Ga'ab Depression

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Abstract: Twelve species of ants belonging to 3 subfamilies were collected from El Ga'ab Depression. Subfamily: Myrmicinae was represented by 4 species: *Monomorium salomonis*, *Monomorium bicolor*, *Monomorium areniphilum* and *Messor* sp. Subfamily: Formicinae was represented by 7 species: *Cataglyphis bicolor*, *Cataglyphis oasis*, *Cataglyphis* sp., *Camponotus maculatus*, *Camponotus*, *Camponotus* sp., *Paratrechina* sp. and Subfamily Ponerinae represented by *Pachycondyla sennaarensis*. The habitat of ant species was recorded and the possibility of finding some species was discussed.

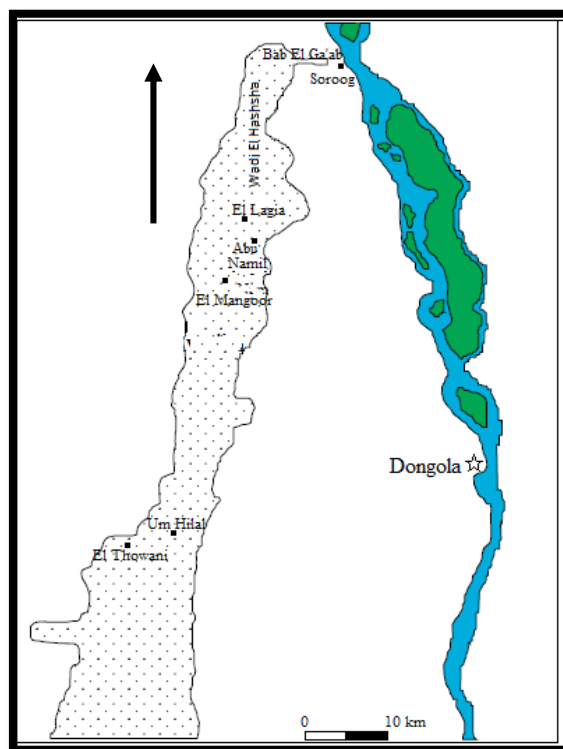
Keywords: Myrmicinae, Formicinae, Ponerinae, Sudan, El Ga'ab.

Introduction

El Ga'ab Depression is situated within North African Sahara zone comprises a basin of about 123 km in length with an average width of 4km and an area of approximately 700Km² (Map. 1).

The El Ga'ab Depression was periodically flooded by the Nile during the Early and Mid-Holocene, shaping its diverse habitats. These include vast expanses of arid desert; life-sustaining oases (Ga'abs) where accessible underground water supports both human settlements and dense vegetation; sandy plains ranging from thin sheets to large dunes; and sandstone areas characterized by water-carved furrows. Other notable habitats are vegetation mounds (*Tarbool*), which are scattered clusters often dominated by *Tamarix aphylla*, some still supporting living plants, and wadis (Khores) shallow depressions within the depression, sandstone, and gravel plateaus that create distinct microhabitats.

The general features of the study area, embodied in compendium of the British colonials, touched few biotic and archeological aspects. Recently extensive geological and biotic surveys were made by Tahir *et al.* (2009, 2012 and 2014).



Map. 1. El Ga'ab Depression

One of the earliest scientific observations of ants in Sudan was conducted by Mellor (1922) in Shambat (Khartoum). The species observed included *Aphaenogaster barbara*, *Dorylus nigricans*, and *D. orientalis*. Weber (1943) also published a book on Sudanese ant species, with a special reference to the Imatong Mountains in Southern Sudan.

Interests in ants of the Sudan includes the role of *Pachcondyla sennarensis* as an intermediate host for the cestode *Raillietina tetragona* (Mohammed *et al.*, 1988); ant diversity at Sunut forest, Khartoum, Sudan (Magboul, 2013), new locality and/or first record for the Sudan (http://antbase.org/ants/africa/new_records_sudan.htm) based on collection made by Z. N, Mahmoud and A. K. Omer and description of a new species (*Lepisiota omeri*) from Haj Abd Alla, Sudan (Taylor *et al.*, 2013).

A study by Ibrahim *et al.* (2023) documented 14 ant species in Northern Kordofan. These include: *Camponotus oasium*, *Camponotus sericeus*, *Camponotus maculatus*, *Cataglyphis abyssinicus*, *Cataglyphis auratus*, *Messor galla*, *Monomorium areniphilum*, *Monomorium bicolor*, *Tetramorium sericeiventris*, *Pheidole escherichii*,

Pheidole rotundata, *Trichomyrmex oscaris*, *Brachyponera chinensis*, and *Megaponera analis*. Five additional genera (*Dorylus* sp., *Paratrechina* sp., *Lepisiota* sp., *Monomorium* sp., and *Pheidole* sp.) were also identified to generic level.

As highly social insects, ants are defined by their organized colonies and a distinct division of labor (Bolton, 1994, Mersch et al 2013, Negroni et al 2023). Their colony populations can vary substantially, from hundreds to over 20 million individuals (Oster & Wilson, 1978), and their individual body lengths span from 0.75 mm to 52 mm (Shattuck, 1999). Ants fulfill diverse ecological roles through adaptable feeding strategies, which include herbivores, predation, and scavenging (Hölldobler & Wilson, 1990, Rosumek, 2017).

This work is part of a project aiming to make a reference collection of faunal forms from El Ga'ab Depression.

1. Methodology

The study area lies west of Dongola at 19° 38.000N, 30° 18.250E; 19° 39.000N, 30° 7.500E; 18° 33.800N, 29° 59.800E; 18° 32.250N, 30° 22.800E (Tahir, 2009). Ant specimens were collected by hand using a strip of paper and immediately preserved in 70% ethanol to which a drop of glycerin was added. The identification of the species was carried out on the basis of the keys of Bolton (1994 and 1995) and http://antbase.org/ants/africa/new_records_sudan.htm.

2. Results and Discussion

Twelve ant species (Family: Formicidae) were identified during this study. All the collected species were reported for the first time from El Ga'ab Depression. Previous record of the species in areas within the region were listed on basis of the fact that daily exchange of goods and services with Dongola and the trucks of artisanal gold miners crossing the are conducive of biodiversity changes.

3. Habitat preferences and distribution

The ant specimens were collected from cultivated areas, natural plant cover and human dwellings that offer nesting burrows, usually in coarse sand, to several ant species. This diversity of ecological niches enabled ants to exploit a wide range of food resources as herbivores, predators, and scavengers.

Order: Hymenoptera. Family: Formicidae:

3.1. Subfamily: Myrmicinae

3.1.1. *Monomorium salomonis* (Linnaeus, 1758).

Specimens (Fig. 1) were collected from all habitats. Previous records were from Al Moltaga (17°57'14.15" N 31°13'36.08" E); Um al Hassan (17°28'608" N 31°29'482" E); Al Hamedi (15° 08'377" N 32°31'587" E). Mohamed and Mohamed (2014) reported it from stem, leaves, fruits and roots of *P. dactylifera* in Oasis (Eltaweel, Elbasheery, Abugaida) in Northern Kordofan State.



Fig. 1. *Monomorium salomonis*

3.1.2. *Monomorium bicolor* (Emery 1877).

It was found in *Phoenix dactylifera*, dead branch of *Acacia* spp and foraging in *Clatropis procera* (Fig. 1). It was also reported by Mohamed and Mohamed (2014) see comments attached to *M. salomonis*.



Fig. 2. *Monomorium bicolor*

3.1.3. *Monomorium areniphilum* (Santschi 1914).

Found in cultivated areas. Previous records from Dongola (19°26'08.51" N 30°28'38.00" E).

3.1.4. *Messor* sp. (Forel 1890). *Messor* (probably *galla*) (Fig. 3).



Fig. 3. *Messor* sp.

3.2. Subfamily: Formicinae

3.2.1. *Cataglyphis bicolor* (Fabricius 1793).

Forage for dead arthropods. *Cataglyphis bicolor* (Fig. 4) was also reported by Mohamed and Mohamed (2014) see comments attached to *M. salomonis*.



Fig. 4. *Cataglyphis bicolor*

3.2.2. *Cataglyphis oasis* (Menozzi 1932).

3.2.3. This species was previously recorded from Sulb (20°26'15.37" N 30°19'51.81" E).

3.2.4. *Cataglyphis* sp. (Foerster 1850).

According to Steck *et al.* (2008) *Cataglyphis* spp. can keep up a body temperature well above 50°C with surface temperatures of up to 70°C. Thus ants can be used as a bioindicators for monitoring the activities of the species and their skink and lizards predators.

3.2.5. *Camponotus maculatus* (Fabricius 1781).

It was found in cultivated land and *P. dactylifera*.

3.2.6. *Camponotus sericus* (Fabricius, 1798).

It is known as Sun-dog ant. It occurs on *Acacia* trees and on *C. procera*.

3.2.7. *Camponotus* sp. (Mayr, 1861).

3.2.8. *Paratrechina* sp. (Motschulsky 1863).

3.3. Subfamily: Ponerinae

3.3.1. *Pachycondyla sennaarensis* (Mayr 1862).

This seed eating ants was previously collected from Al Hamed (15° 08'377" N 32°31'587" E); Al Moltaga (17°57'14.15" N 31°13'36.08" E).

The possibility of finding *Camponotus oasis* and *Camponotus niveoetsus* reported by Mohamed and Mohamed (2014) reported it from stem, leaves, fruits and roots of *P. dactylifera* in Oasis (Eltaweel, Elbasheery, Abugaida) in Northern Kordofan State;

should not be excluded due to similarity of habitat. Other species which are likely to be found are given in Table 1.

Table 1. Ant species which are found in the neighboring area and likely to be found in El Ga'ab Depression

Species	Site off collection
<i>Cataglyphis bombycinus</i>	Selima Oasis (21°22'16.90" N 29°18'64.15" E)
<i>Camponotus galla</i>	
<i>Brachyponera ruginota</i>	Toska (20°46' 01.88" N 30°18'50.14" E)
<i>Cataglyphis oasisium</i>	Sulb (20°26'15.37" N 30°19'51.81" E)
<i>Brachyponera ruginota</i>	Shada (20°08'32.11" N 30°15'3.37" E)
<i>Monomorium subopacum</i>	
<i>Cataglyphis desertorum</i>	Dongola (19°26'08.51" N 30°28'38.00" E)
<i>Cataglyphis abyssinicus</i>	Al Khandag (18°36'505" N 30°33'981" E)
<i>Paratrechina longicornis</i>	Al Moltaga (17°57'14.15" N 31°13'36.08" E)

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