

Feeding/ Resting Behavior of Marabou Stork (*Leptoptilos Crumenifer*) in Galagu Camp, Dinder National Park (DNP), Sudan



Tahani Ali Hassan*

Department of Wildlife Sciences, College of Natural Resources and Environmental Studies, University of Bahri, Khartoum, Sudan

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***Corresponding author:** Tahani Ali Hassan, Department of Wildlife Sciences, College of Natural Resources and Environmental Studies, University of Bahri, Khartoum, Sudan

Abstract

The study aimed to determine the feeding, walking, and resting behavior of Marabou stork *Leptoptilos crumenifer* in Dinder National Park (DNP), which lies between latitude 11° 45 E 12° 50 N and longitude 34° 30 E 36° 00 N at the south-eastern part of Sudan against the Ethiopian frontier. The feeding and walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* were studied by the scan sampling methods, at ten minutes intervals. Four observation times have been conducted; 05:00- 06:00 am., 10:00- 11:00 am., 11:00 am.- 03:00 pm., and 05:00- 06:00 pm. respectively for a period of 7 hours per day from March to April 2022. The total observation hours for the entire study period from March to April during the four observation times was 210. The study prevailed that Marabou stork *Leptoptilos crumenifer* spend much of their daily time budget resting followed by feeding behavior in Galagu Camp, DNP. Major resting behavior occurred from 01:00- 02:00 pm. followed by 12:00 -01:00 pm., the walking behavior dominated at 10:00- 11:00 am. And 05:00 - 06:00 pm. during March and peaked at 02:00- 03:00 pm. and followed by 11:00 am. - 12:00 pm. and 05:00- 06:00 pm. in April. Since the study period was very short, more studies on the behavior of Marabou stork *Leptoptilos crumenifer* are needed.

Keywords: Marabou stork; Behavior; Galagu Camp; Dinder National Park (DNP)

Introduction

The Marabou stork *Leptoptilos crumenifer* is a massive bird large specimen, which is thought to reach a height of 152 Centimeters (4.99 feet) and a weight of 9 kg [1]. With a wingspan of 3.7 m (12 ft.), the species has the largest wing spread of any living bird. Typical weight is 4.5–8 kg (9.9–17.6 lb.), unusually as low as 4 kg (8.8 lb.), and length (from bill to tail) is 120 to 130 cm (47 to 51 in) [2]. Marabou Storks *Leptoptilos crumenifer* in Sudan are commonly found in many habitats, often near human settlements. They migrate north during the rains, but they breed mostly in Southern Sudan [3,4]. Like most storks, the marabou is gregarious and a colonial breeder. In the African dry season (when food is more readily available as the pools shrink), it builds a tree nest in which two or three eggs are laid. It is known to be quite ill-tempered.

The marabou stork is a frequent scavenger, and the naked head and long neck are adaptations to this livelihood, as it is with the vultures with which the stork often feeds. [3,4]. This large and powerful bird eats mainly carrion, scraps, and feces

but will opportunistically eat almost any animal matter it can swallow. It occasionally eats other birds [3,4]. When feeding on carrion, marabou frequently follows vultures, which are better equipped with hooked bills for tearing through carrion meat and may wait for the vultures to cast aside a piece or steal a piece of meat directly from the vulture or wait until the vultures are done. [5]. The favorable habitat for Marabou Storks is those near water where most Storks live as waders in shallow pools and marches in search of food in the form of fish, and frogs. Near human habitations, they feed on carrion and scavenge on waste collection sites or rubbish dumps [6,7]. Increasingly, marabous have become dependent on human garbage and hundreds of the huge birds can be found around African dumps or waiting for a handout in urban areas [6,7]. Very few studies have been conducted on Marabou stork *Leptoptilos crumenifer* in DNP, and there is a lack of information on their behavior; therefore this study aimed to determine the daily time budget; feeding, walking, and resting behavior of Marabou stork *Leptoptilos crumenifer* in DNP.

Study Area

Dinder National Park (DNP) was established in 1935, the park lies between latitude 11° 45 E 12° 50 N and longitude 34° 30 E 36° 00 south-eastern- eastern part of Sudan against the Ethiopian frontier [8]. The area of the park principally consists of a low-lying flood plain that slopes gently from the Ethiopian high lands with a few rocky hills at its southern corner [8]. The global significance of the DNP is that it falls between two important ecological zones, the Sudan-Sahelian and the Ethiopian. DNP was designated as A Ramsar site in 200. The National Park supports 27 species of mammals, more than 160 species of birds, and 32 species of fishes, reptiles, and amphibians. There are about 58 species of shrubs and trees [8]. The climate is characterized by two seasons a hot and humid rainy season (May- November) and a cool and dry season (December-March). Annual rainfall averages about 800mm [9].

Materials And Methods

The feeding/ resting and walking behavior of Marabou stork *Leptoptilos crumenifer* were studied by the scan sampling methods [10], within ten minutes intervals, four observation times has been conducted; 05:00- 06:00 am., 10:00- 11:00 am., 11:00 am. – 03:00 pm., and 05:00- 06:00 pm. respectively for a period of 7 hours per day from March to April 2022. Marabou stork *Leptoptilos crumenifer* was observed daily during the observation times, and data on activity patterns such as feeding, walking, and resting behavior were recorded, using focal animal sampling [10]. At the start of the observations, each day; Ten Marabou storks were selected randomly, and video recorded using a digital zoom camera, the focal birds instantaneously scanned for the major behavior, including feeding, walking, and resting. The daily activities were recorded at 10 minutes intervals for 7 hours daily during the study period. Depending on the number of

Marabou stork *Leptoptilos crumenifer* visible at any one time, the recording took 5 minutes.

Results and Discussion

The main objective of the study was to determine the feeding, walking, and resting behavior during the late dry season in Dinder National Park (DNP) Sudan. The data collected has been presented in a form of tables, Table 1 showed the feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP) Mach 2022, and Table 2 showed feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP) April 2022. The behavior of Marabou stork *Leptoptilos crumenifer* in this study was largely limited to feeding, walking, and resting. Daily activity patterns were studied by calculating the proportion of time spent in each activity and then summed over and summarized on an hourly basis from March to April 2022. During this study period, a total of 210 observation hours were made for the entire study period from March to April during the four observation times. There were alternating periods of feeding, resting, and the walking behavior of Marabou stork *Leptoptilos crumenifer* in the park, The study showed that Marabou stork *Leptoptilos crumenifer* spend much of their daily time budget resting (46%, 40% respectively) followed by feeding (34%, 38% respectively) in Galagu Camp, DNP (Table 1&2). The dominant daily activity was resting, which peaked at 01:00 pm. - 02:00 pm. followed by feeding that peaked at 05:00- 06:00 am. And 05:00- 06:00 pm. Major resting activity occurred from 01:00- 02:00 pm. followed by 12:00- 01:00 pm. At 05:00 - 6:00 am., the dominant activity was resting which peaked at 01:00 - 02:00 pm. during March and April 2022 (Table 1&2).

The most active feeding hours of the day were 05:00- 06:00 am., followed by 10:00 – 11:00 am., another active feeding hour occurred at 05:00- 06:00 pm (Table 1&2).

Table 1: Feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP) Mach 2022.

Time	Daily activities		
	Feeding	Walking	Resting
05:00- 06:00 am	20	5	15
10:00- 11:00 am	18	4	18
11:00 am. - 12:00 pm	10	10	20
12:00 - 01:00 pm	7	9	24
01:00 - 02:00 pm	5	7	28
02:00 - 03:00 pm	15	10	15
05:00 - 06:00pm	19	12	9
Percentage	34%	20%	46%

Table 2: Feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP), April 2022.

Time	Daily activities		
	Feeding	Walking	Resting
05:00 - 06:00 am	25	10	5
10:00 - 11:00 am	15	7	18
11:00 am. - 12:00 pm	25	10	5
12:00 - 01:00 pm	6	6	28
01:00 - 02:00 pm	4	3	33
02:00 - 03:00 pm	10	15	15
05:00 - 06:00pm	22	10	8
Percentage	38%	22%	40%

The walking activity dominated at 10:00- 11:00 am. And 05:00 - 06:00 pm. during March (Table 1) and peaked at 02:00-03:00 pm. and followed by 11:00 - 12:00 pm. and 05:00- 06:00 pm. in April and this is may be attributed to the searching for food in the morning and leaving to their roosting sites in the evening.

The birds depend on the carrion, insects, and the leftover and remaining fish and meat thrown by the visitors and the game scouts which is in line with the findings of [11]. In comparison between the two Months, there were not many differences in the daily activities of the Marabou stork *Leptoptilos crumenifer* because the climate of Dinder national park consists of two climatic seasons, dry and wet seasons. The dry season starts immediately after the rains from the wet season starts in April with a maximum temperature of 40° C. In May and ends in November during which the area receives an annual rainfall ranging between 600-800 mm increasing southwards [12].

Conclusion and Recommendation

Globally, the bird population is decreasing as a result of natural causes such as climate change and human interference, so it is important to study the feeding, resting, and walking behavior of Marabou stork *Leptoptilos Crumenifer* in DNP, to get recommendations that help to conserve and manage this species. Marabou stork *Leptoptilos Crumenifer* spend most of their daily activity resting (40% and 46%) followed by feeding (34% and 38%) and walking (20% and 22%). The feeding of Marabou stork *Leptoptilos Crumenifer* and other animals in the park by people should be stopped because it will affect their feeding behavior and their future survival. Since the study period was very short, more studies on the behavior of Marabou stork *Leptoptilos Crumenifer* are needed.

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