Studies on Bryoflora of Bani-Sweif governorate

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By

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DECLARATION

This thesis has not been previously submitted for any degree at this or any other university.

The references in the text will show specifically the extent to which I have dedicated myself to the work of other authors.

Haidy Samir Isaac Salama

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DEDICATION

ALL THANKS TO ALLAH

I DEDICATE THIS WORK.

TO MY BELOVED GREAT DAD, MY GREAT MUM AND MY BROTHER PETER.

YOURS,

HAIDY SAMIR ISAAC

Contents

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List of Abbreviations

Afr	Africa
Am	America
ANG	Angola
As	Asia
Austr	Australia
B.S.H	Bani-Sweif Haidy
BEN	Benin
BIO	Bioko (Fernando Po)
BOT	Botswana
BUR	Burundi
BWh	Hot arid desert climate
CAF	Central African Republic
Cai	Cairo
CAIA	Ain Shams University herbarium
CHA	Chad
CMN	Cameroon
COM	Comoro Islands
CON	Congo
CVI	Cape Verde
Da	Arabian Desert
Dg	Galala Desert
Di	Isthmic Desert
DJI	Djibouti
Dl	Libyan Desert
Dn	Nubian Desert
EG	Egypt
ERI	Eritrea
ETH	Ethiopia
Eur	Europe
GAB	Gabon
GE	Gebel Elba
GPS	Global Positioning System
GUI	Guinea
IVO	Ivory Coast
KEN	Kenya
LES	Lesotho
MAU	Mauritius
MDG	Madagascar
MLW	Malawi
Mm	Mareotic sector

List of Abbreviations

MOZ	Mozambique
MTN	Mauritania
NAM	Namibia
Nf	Nile Fayoum
Nd	Nile Delta
NGA	Nigeria
NGR	Niger
Nn	Nile Nubia
Nv	Nile Valley
O	Oases of Nubian and Libyan Desert
Oc	Pacific Ocean Islands
o.r.v.	Old records of valley
R	Red sea coastal plains
REU	Réunion
ROD	Rodrigues
RWA	Rwanda
S	Southern Sinai
SAF	South Africa
SEN	Senegal
SEY	Seychelles
SOC	Socotra
SUD	Sudan
S.SUD	South Sudan
SWZ	Swaziland
TAN	Tanzania
TOG	Togo
UGA	Uganda
ZAI	Democratic Republic of Congo (former Zaire)
ZAM	Zambia
ZIM	Zimbabwe

Abstract

In this study, 400 moss samples were collected from four markazes (El-Wasta, Nasser, Bani-Sweif and Ehnasyia) of Bani-Sweif governorate. Only 150 samples of them were examined, giving when purified 154 specimens. These taxa were identified to 27 species belonging to 15 genera, five families and five orders. These species were described and illustrated. Keys to orders, genera and species were provided. Sporophyte stage was reported 17 times from two species (*Entosthodon obtusus* and *Funaria hygrometrica*); archegonia were reported four times from three species, antheridia were reported twice from two species while gemmae were found nine times from five species.

This study added two new records (*Tayloria lingulata* and *Trichostomum planifolium*) to Africa, eight to Egypt, 21 to Nile valley and 25 to Bani-Sweif governorate.

Introduction

Bryoflora is the science concerned with studying bryophytes in their natural habitats. Bryophytes consist of three main divisions: mosses (Bryophyta), liverworts (Marchantiophyta), and hornworts (Anthocerophyta). They are the second prevalence land plants after angiosperms. They have the ability to inhabit every microhabitat with the suitable conditions in all continents.

Bryophytes have a lot of ecological importance. They considered the pioneer plants to inhabit arising ecosystems and used in nitrogen fixation, erosion control, indication of environmental conditions and heavy metals in air pollution.

Among the three groups of bryophytes, Mosses receive major interest from scientists as they represent the largest division between the three groups of bryophytes around the world and in Egypt.

Moss flora have been studied in 11 territories out of the 15 phytogeographical territories in Egypt. Nile valley (Nv) represents one of the poorest studied phytogeographical territories in recording mosses. That, if compared with its large area and availability of suitable habitats for moss growing.

This was the trigger to start a detailed study on the moss flora of Nv governorates beginning with Bani-Sweif governorate.

Review of literatures

Bryophytes are a group of land plants that evolutionary located just above algae and lower than vascular plants. They were the earliest land plants that inhabit Earth as the oldest microfossils attributed to the cryptospore of a liverwort recorded from the middle Cambrian (calibrating 502,000,000 years) **(Plackett *et al*., 2015).**

Their number around the World is estimated to be 20,000 taxa. **(www.theplantlist.org).** They consisted of three major divisions which are Marchantiophyta (Liverworts), Bryophyta (Mosses), and Anthocerotophyta (Hornworts) **(Howe, 1899).** Mosses is the largest group among them with estimated number 15,000 taxa **(www.bryophtes.plant.siu.edu.).**

Moss study in Egypt began since the French campaign, when **Delile (1812)** recorded three taxa from Cairo, then 21 foreign researchers recorded mosses in different regions. Only **Lorentz, 1867** (recording *Funaria hygrometrica)*, **Müller, 1874** (recording *Entosthodon curvi-apiculatus*, *Gymnostomum viridulum* and *Physcomitrium niloticum)* and **Sickenberger, 1901 (**recording *Funaria hygrometrica, Entosthodon curvi-apiculatus* and *Gymnostomum viridulum)* recorded mosses from Nile Valley.

In **1972** a first alphabetical list of mosses has been published by **Imam and Ghabbour**. It included 69 moss taxa with their localities and phytogeographical territories. This list recorded four moss taxa (*Barbula indica, Bryum dichotomum, B. subapiculatum* and *Physcomitrium*