Flora of Egypt

Special Botany

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Flora of EGYPT

Definition of the word Flora

The name Flora is a Latin name meaning " the mythological Roman goddess of flowers and spring " الهة الرومان الاسطورية من الازهار والربيع.

Flora is the plant life occurring in a particular region or time.

Plants are grouped into floras based on region (floristic regions), period, special environment, or climate .

Regions can be geographically distinct habitats بيئات واضحة جغرافيا like mountain and flatland.

Floras can mean plant life of a historic era as in fossil flora .

Floras may be subdivided by special environments:

Native flora. The native and indigenous الاهلية flora of an area.

Agricultural and horticultural flora (garden flora). Plants are deliberately بتعمد grown by humans.

Weed flora. نباتات الأعشاب الضارة this classification was applied to plants regarded as undesirable, and studied in efforts to control or eradicate them.

Herbarium - Collection and preservation of Plants

Herbarium - Collection and preservation of Plants

The necessity of plant collection and the importance of Herbaria in particular has been greatly increased in these days due to the present human impact and changing environment .

-These negative trends often resulted in the disappearance of tropical and subtropical forests in many parts of the world.

- According to environmentalists, the number of plant and animal species disappearing now from all over the world is three or four times more than it was in the previous centuries.

In Egypt, one of the reasons for the this extinctions is the fluctuations انقراض هو التقلبات in the climatic change .

-Well preserved plants in a herbarium are a great help for all botanists who are engaged in the study of the flora of a country or a region .

-Collecting wild plants for scientific study requires some sort of special skills .

- Following is an outline مخطط of the method of collection and how to preserve these plants for future study.

1 -A field-bag to carry smaller items such as notebook, polythene and paper bags, binoculars, camera, GPS, pens or pencils, knives/scissors, Lap Tops computer…….. etc.

2 .A field press consists of two end boards having 18 X12 inches size and 1 inch thickness, two strong webbing straps, preferably 1.5 m long and non-slip buckles .

- Double faced cardboards have long axis (18X12 inches), sufficient quantity of old newspapers and blotting نشاف papers.

3 .Number tags: Each tag بطاقة will carry a number which enables the collector to find out the description of the specimen from the field note book at a later stage.

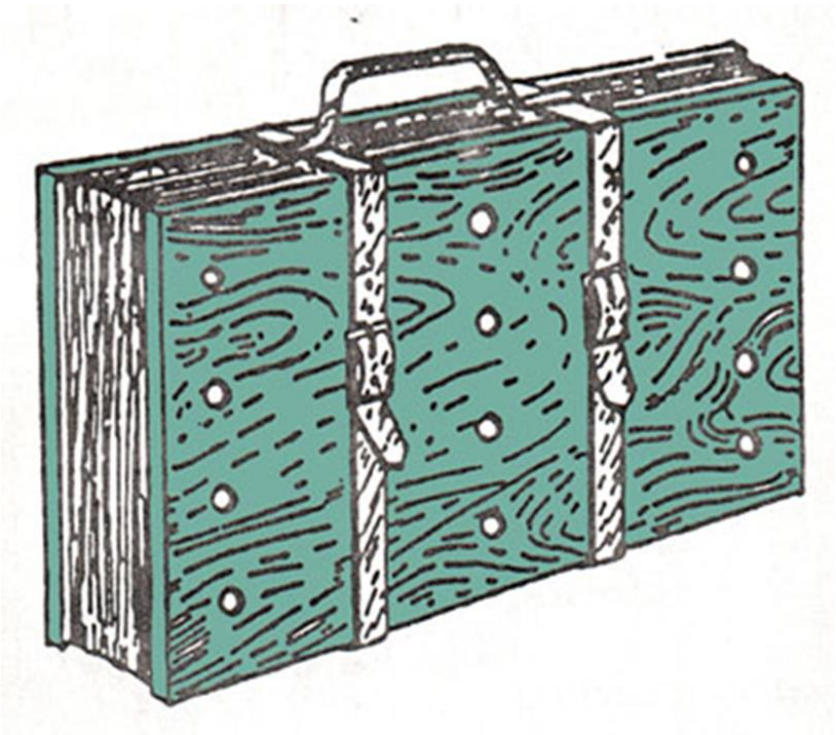
4 .Field book: Many features of the specimen cannot be detected from a dried specimen .

The description in the field book will be a great help for the collector in identifying the plant .

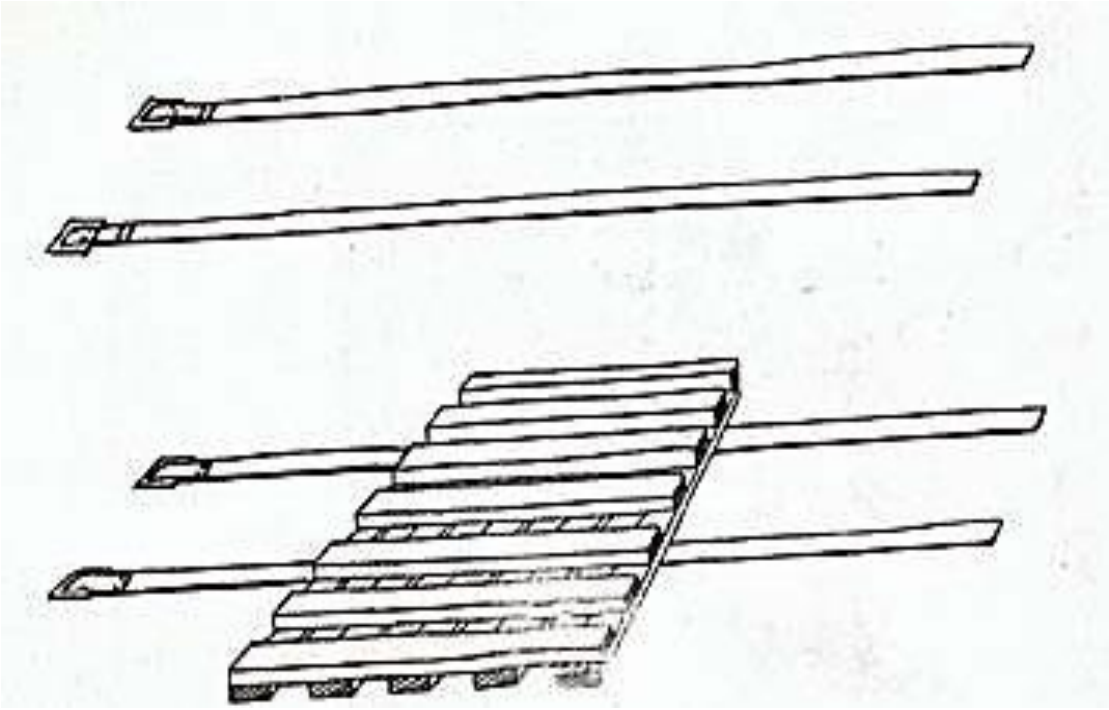
A usual field book contains information such as Name of the specimen, local name, locality, collectors name, collection number, date of collection, soil type and a brief description about the plant.

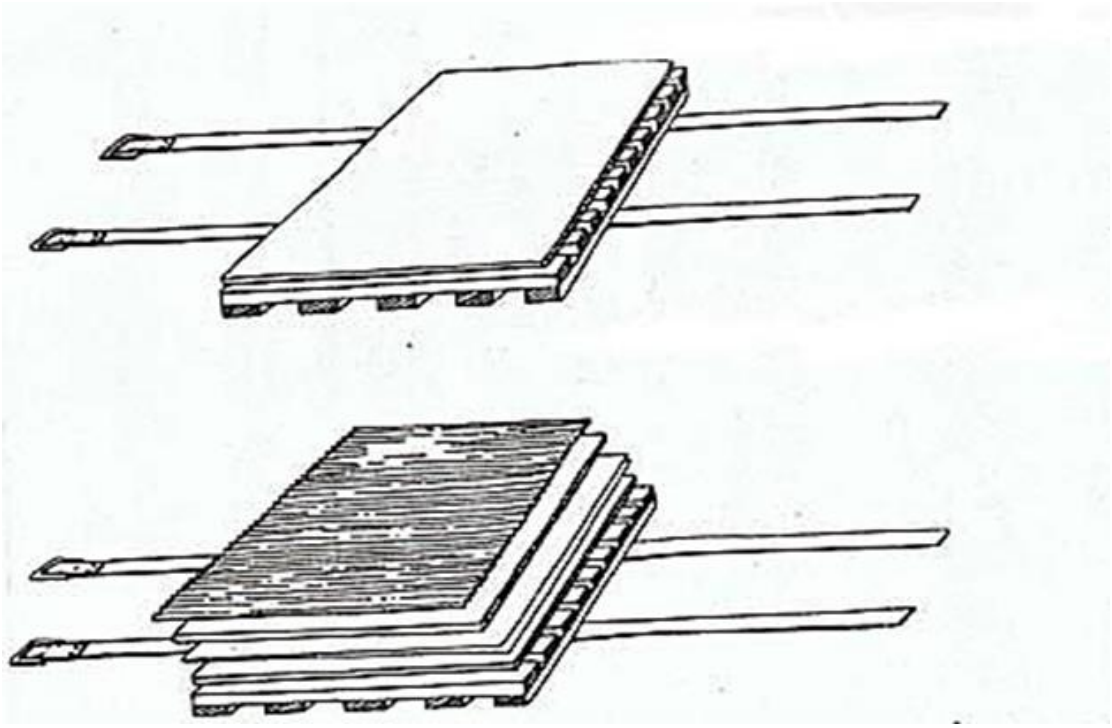
5. Cutting implements like pruners, showel مجرفة, axes فئوس, etc.

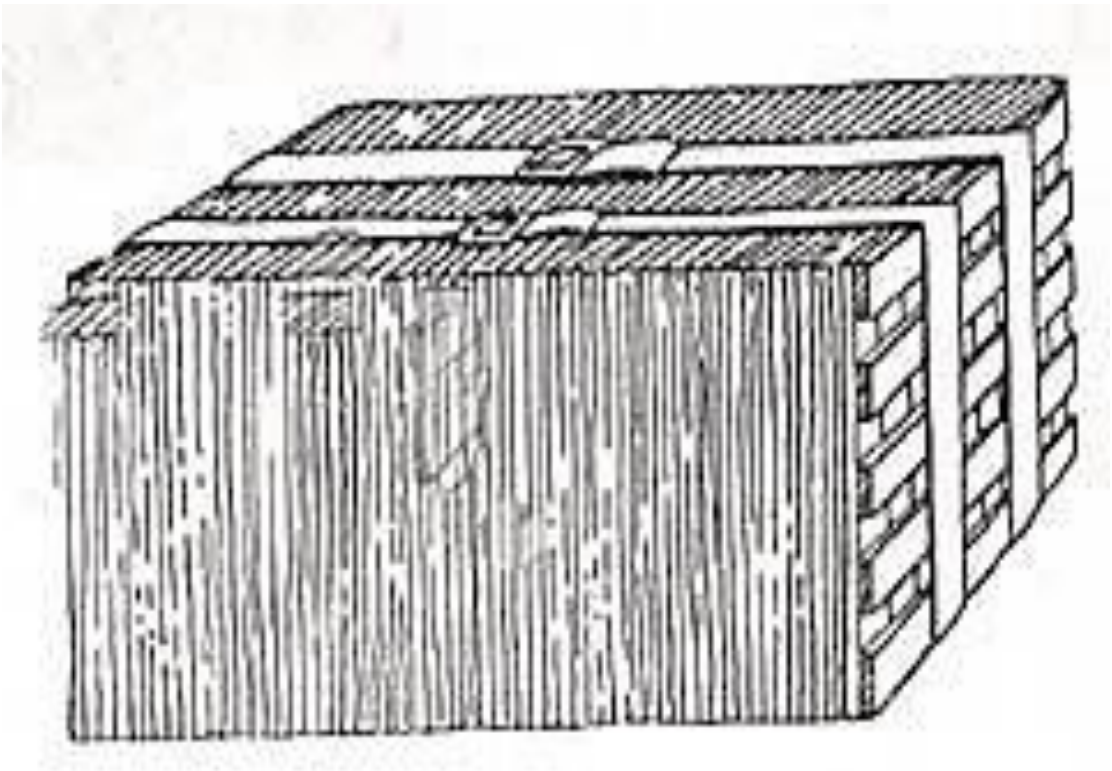
6. Polythene/paper bags of various sizes.



Herbarium - Collecting the specimens







-A botanical specimen may consists of one or more whole plants, complete with roots, stem, leaves, flowers and if possible, with fruits .

-If the plants are small, it is advisable to collect several specimens of the same plant from close proximity .

- In the case of large herbs, shrubs or trees, it is necessary to collect a portion of a twig with leaves and flowers/fruits as a representative specimen.

-The size of the specimen, if it is for preservation, depends upon the size of the sheet for mounting .

-Usual size of the herbarium sheet is 17X11 inches .

-After collection, the specimen is tied with a tag with a number (same as the number given for the description of the plant written in the field book.) .

- Most of the plants wilt very rapidly after being cut or dug out of the ground.

-Previously, collectors used a metal box called vasculum into which the collected plants were placed for carriage to the field base or herbarium .

-Now the advent of polythene bags have become more convenient and can keep the plants fresh for more than 3 hrs.

-Sometimes the flowers or fruits are too large to be pressed with the leaves .

- In such cases, flowers or fruits may be kept separately in small polythene or paper bags, each containing the same number as the other specimen with leaves.

A minimum of two specimens should be collected for every species (depending upon the size of the populations).

Once the collection is over, the next step is to press the specimens .

This is the most difficult part of the collection and is to be done as early as possible .

In arid countries like Egypt, the specimens can be dried with the help of an ordinary press without using artificial heat.

-The ventilated drying press for this purpose can be prepared as follows:

.1Place the two straps horizontally on a table or the ground with buckles of the left.

.2Place one end board across the strap .

.3Then place one or two corrugated cardboards on the top of the end boards .

4. Take one of the specimens carefully from the polythene bag. - Make sure that the tag is still tied on to the specimen.

The specimen is then placed in the newspaper folder .

While pressing, make sure that the leaves are upside down to show the ventral side .

The leaves which are too large to fit on the herbarium sheet need to be cut into parts or folded. Large, pinnately or bipinnately compound leaves much be pruned to fit on the herbarium sheet .

While pruning, the base of the leaf-stalk should not be removed. This may help taxonomists who examine the specimen at a later stage to get an idea of the position and number of leaflets.

If the flowers are too large or have deep tubular corolla, it is advisable to split the flower longitudinally so that their parts can be readily seen .

Many fruits are difficult to press satisfactorily because of their large size .

Such fruits can be cut transversely and longitudinally and press one half or part of it.

.5Place a blotting paper or corrugated cardboard over the newspaper folder containing the specimen .

.6Repeat this method for the rest of the specimens.

When the press has sufficient number of specimens with blotting papers and corrugated cardboards alternating with the newspaper folders, the other end board can be placed over it and tighten the straps evenly .

The specimens have to examined periodically, preferably in every 24 hrs.

-The newspapers, if moist, are need to be replaced with new ones .

-While changing the newspapers, make sure that the number tag is still with the material and all the fragments such as flowers or fruits are also transferred to the new newspaper folder .

-This way moisture is absorbed from the material to absorbent by the simple process of diffusion .

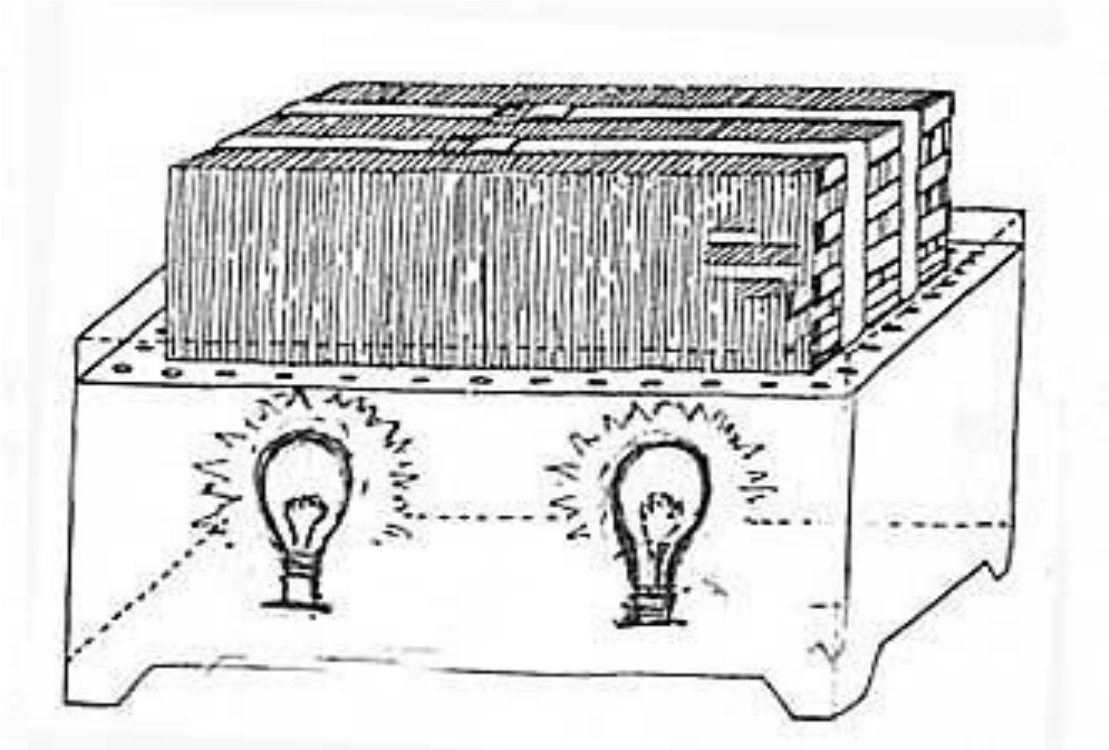
- The used absorbents can be made ready for re-use by placing them outside during the day time or in a drier.

During winter season an artificial drier will be helpful to speed up the removal of moisture from the specimens .

This can be done by making a wooden box with metal net or a perforated sheet on the top side and two or three electric bulbs connected at the bottom of the box .

The number of days that the materials remain in the press depend on the type of specimens .

As a rule, a plant is ready when it is crispy and not cool when touched.



In many tropical and sub-tropical countries, poisoning the specimens is another important step before mounting in order to prevent any possible fungal or bacterial attack in future .

The solution used for this purpose consists of Mercuric Chloride, Ammonium Chloride and Ethyl Alcohol .

The quantity of chemical used at a time depends upon the number of specimens to be poisoned.

Dissolve 150 grams of Mercuric Chloride and 350 gms of Ammonium Chloride in a little water as possible .

To This add 10 liters of 96% alcohol .

Applying the chemicals can be done by brushing it gently on the specimens .

After poisoning, the specimens may remain in press for another day or two in order not to get the leaves and flowers wrinkled.

The next step is mounting .

It can be mounted to any stiff paper of 17x11 inches size. Specimens can be mounted by using any non-toxic white glue available in the market or can be done by using narrow strips of adhesive tape either cloth or paper backed .

Gluing, as the name implies, involves the attachment of the specimen to the mounting sheet by applying glue on the underside of leaves and twigs.

After gluing, the specimen is mounted in the middle of the sheet and place small weight over it for some time .

Fragments of the inflorescence, detached flowers, broken twigs or loose fruits can be put in a separate plastic or paper bag (5X5 cm) and pined or stick at the left hand corner of the herbarium sheet .

This can be used for studying the specimen in the future. Finally comes the labeling.

Usually the label (14X14 cm) is fixed at the right hand bottom corner of the sheet .

A label consists of collection number, Latin name, Family Name, Vernacular Name, Habit, Habitat, Locality, Date of Collection and Collector's name .

A small space may be provided at the bottom of the label to write notes of any special interest .

In some labels, map of the country is also included in order to mark the locality of the plant from where it is collected.

Storing the Herbarium sheets: Most of the genera have more than one species.

All these specimens can be brought together in a separate cover, called species cover .

This should be of a different colour in order to differentiate it from the herbarium sheet .

In some herbaria species covers are grouped together in a genus cover .

The species covers should be clearly labeled with genus and species names and placed in the pigeon-holes of the cabinets in alphabetic order.

Flora of Egypt

Flora means the plants of a particular region or period, listed by species and considered as a whole.

Plant Diversity in Egypt - Introduction

-Egypt is one of the north African countries.

-It is occupying the north eastern corner of the Africa.

-It extends eastward in the Asia for approximately 61000 km². (the area of the Sinai Peninsula.

It is approximate roughly a square.

It measures 1073 Kms in length, 1226Kms in width.

It embraces a total area of a million sq. kms.

Egypt is characterized by a warm and almost rainless climate.

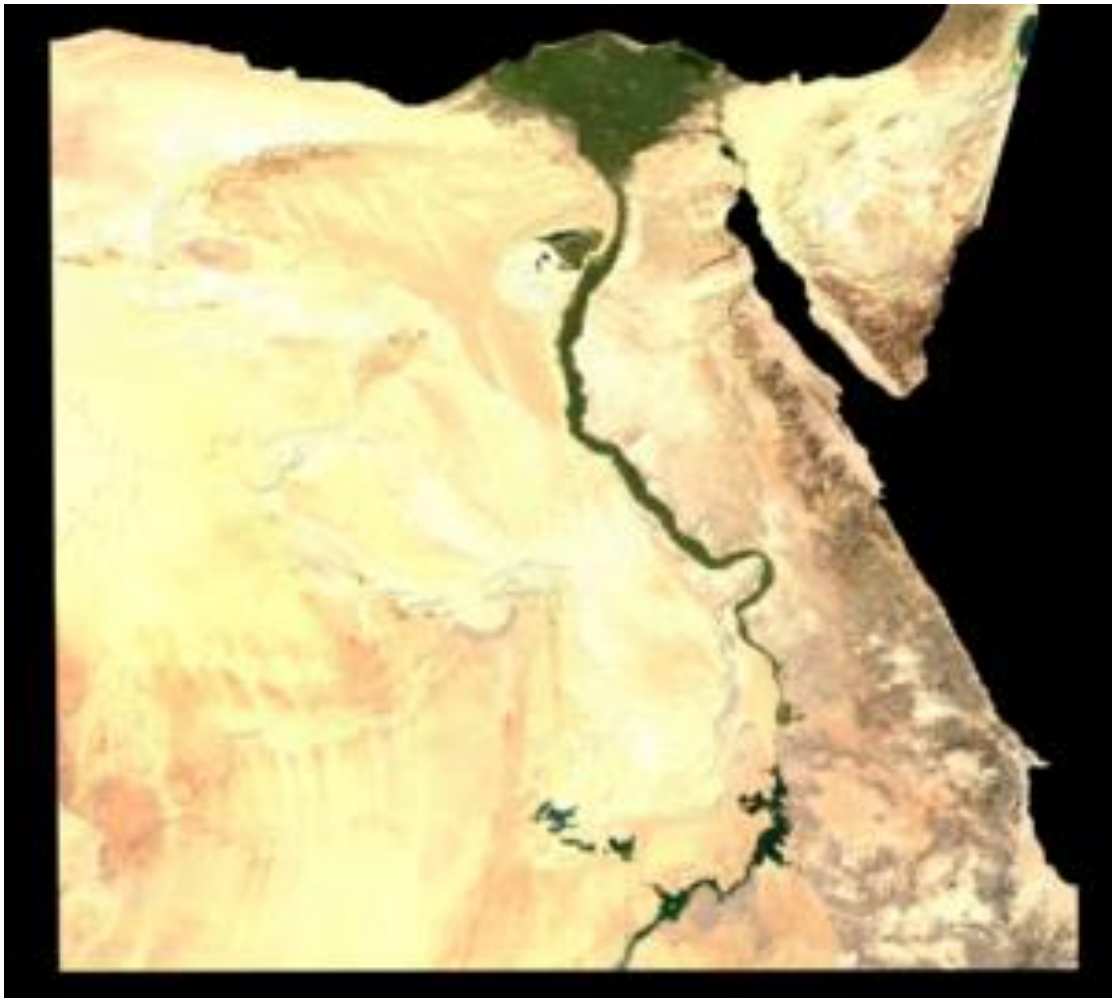
The air temperature rises to over 40 °C during summer, and seldom falls as 0 °C during the coldest nights .

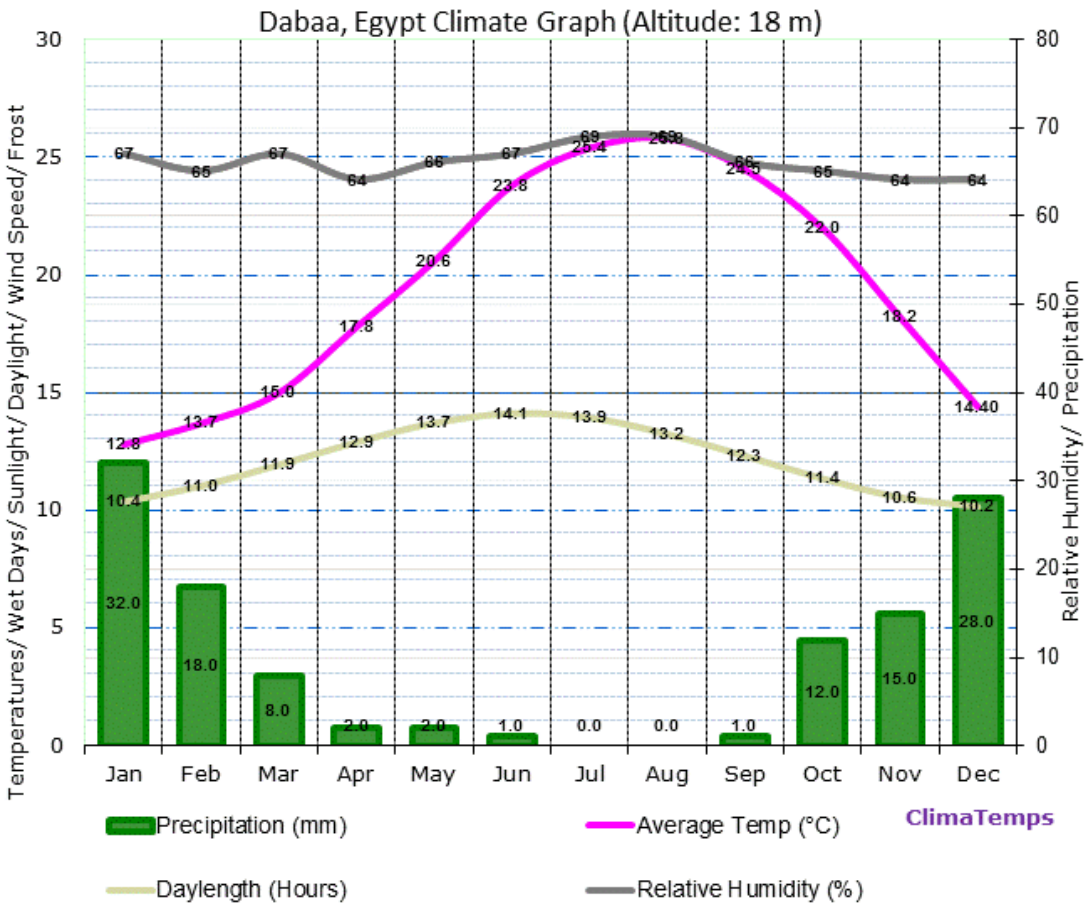
The average rainfall over the country from 200 mm in the coast to practically no rain at all in the south.

With so scantly a rainfall, the greater part of Egypt consists of barren and inhospitable desert.

The Nile river within its Valleys, the Fayium depressions an the Delta are fertile areas.

It is true that Egypt fertile land is the Gift of the Allah.




Dabaa, Egypt Climate Graph (Altitude: 18 m)
Temperatures/ Wet Days/ Sunlight/ Daylight/ Wind Speed/ Frost
Relative Humidity/ Precipitation
30
25
20
15
10
5
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18.2
14.40
10.4
11.0
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12.9
13.7
14.1
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13.2
12.3
11.4
10.6
10.2
32.0
18.0
8.0
2.0
2.0
1.0
0.0
0.0
1.0
12.0
15.0
28.0
Precipitation (mm)
Average Temp (°C)
ClimaTemps
Daylength (Hours)
Relative Humidity (%)

The desert area of Egypt is about 96% of the total area of the country.

It consists of stony plateau in many places, dissected by valleys and in others, pitted with huge depressions and oases or covered with drifted sands .

In some regions the desert is mountains.

Ecologically, Egypt can be divided into 4 main regions:

the Nile region, the Western Desert, the Eastern Desert and the Sinai Peninsula.

The Nile Region comprises all of the land formed and irrigated by the Nile River and this include:

The Nile Valley or

Upper Egypt, that extends from Wadi Halfa (350 km south of Aswan) in the Sudan-Egyptian border northward to Cairo for approximately 1530 km.

The Nile Delta or Lower Egypt, from Cairo northward to Rosetta and Damietta at the Mediterranean Coast and the Nile Fayium, a depression in the western desert and may comprised the northern lakes of the Nile Delta and the Deltaic Mediterranean Coast.

The Western Desert comprises three subregions:

- The western Mediterranean coast,
- The Oases and Depressions and
- Gebel Uweinat.

The Eastern Desert comprises:

- The Red Sea coastal land and
- The Inland Desert.

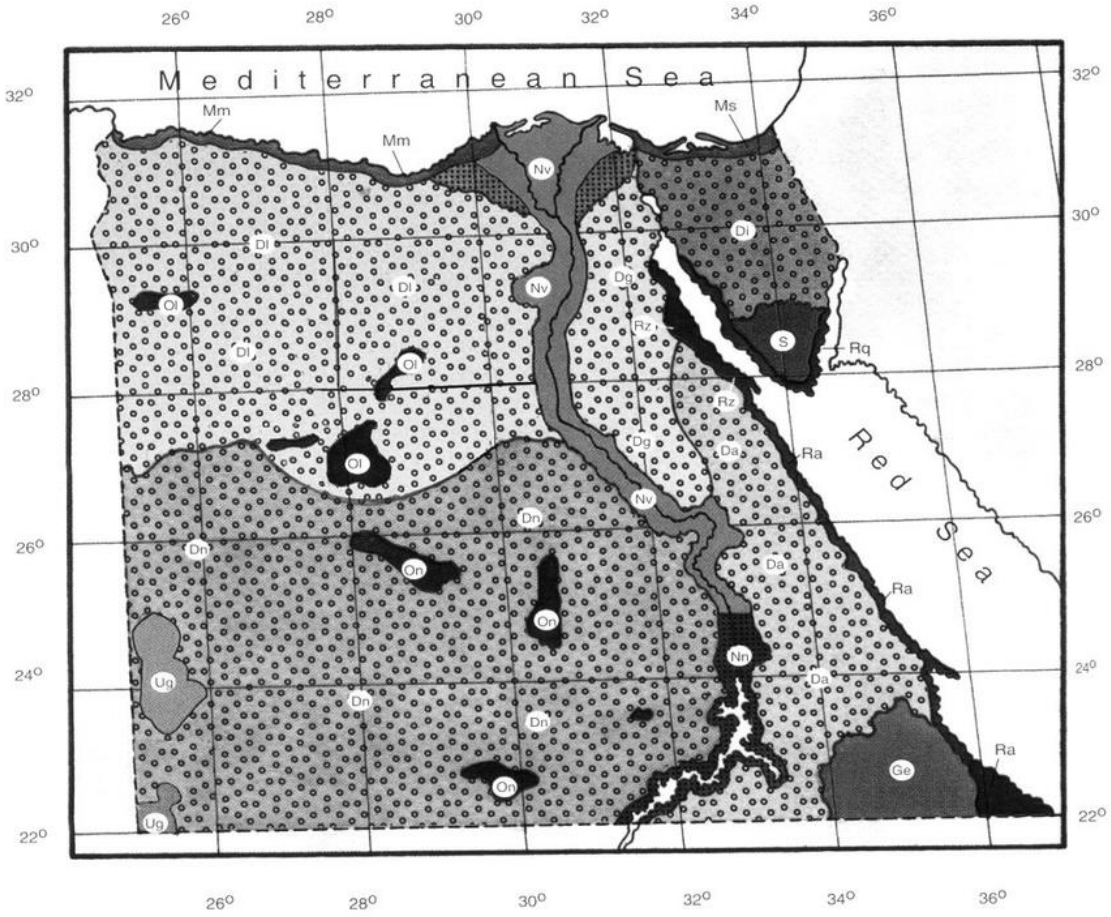
The Sinai Peninsula comprises three subregions:

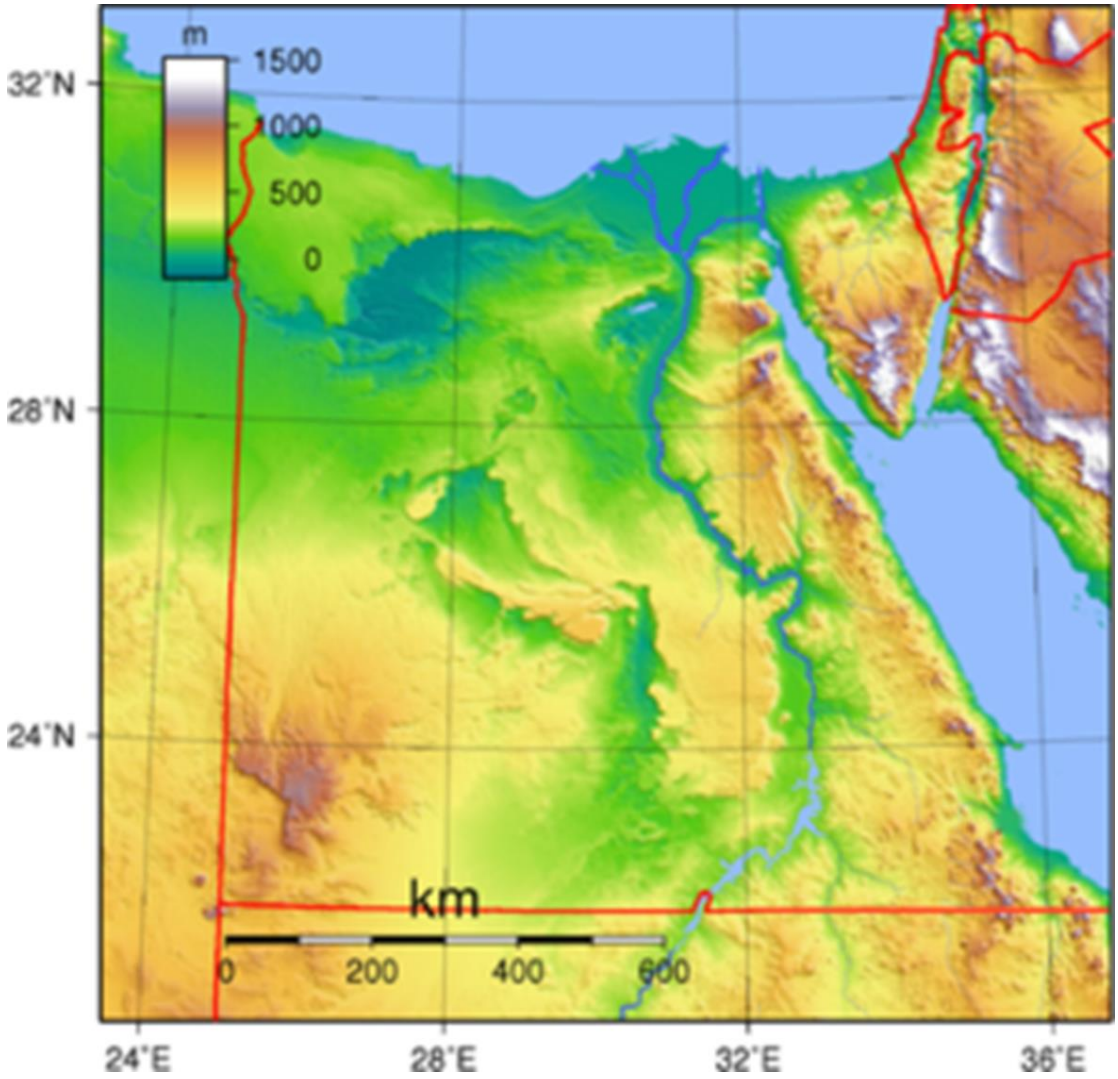
- The northern subregion that includes the eastern section of the Mediterranean coastal land of Egypt,
- The central and the Southern subregions with their coastal area along the Gulf of Aqaba and Gulf of Suez.

Each of the 4 main regions of Egypt is characterized by its environmental characterize which produce different floristic elements.

The phytogeographical territories of Egypt (after EI HADIDI, 2000). (Da) Arabian Desert, (Dg) Galala Desert, (Di) Isthmic Desert, (Dl) Libyan Desert, (Dn) Nubian Desert, (Ge) Gebel Elba district, (Mm) Mareotis sector of the Mediterranean coastal land, (Ms) Sinaitic sector of the Mediterranean coastal land, (Nn) Nubian sector of the Nile land, (Nv) Nile valley sector of the Nile land, (Ol) Oases of the Libyan Desert province, (On) Oases of the Nubian Desert province, (Ra) Arabian sector of the Red Sea coastal plains, (Rq) Aqaba Gulf sector of the Red Sea

coastal plains, (Rz) Suez Gulf sector of the Red Sea coastal plains, (S) Mountainous southern Sinai, and (Ug) Gebel Uweinat.





The natural resources ,الموارد الطبيعية particularly the wild plants are regarded as a vital component عنصر حيوي of Egypt's natural wealth الثروات الطبيعية.

The plant diversity of Egypt is relatively not as simple as one would expect from a 'desert' country.

The species are not evenly distributed in Egypt .

The majority of species is seen in the Mediterranean and Nile regions.

A total of 191 endemic and near-endemic taxa are recorded from Egypt and one or more neighboring countries.

About 31.6% of endemics are found in the Mountainous Southern Sinai subregion.

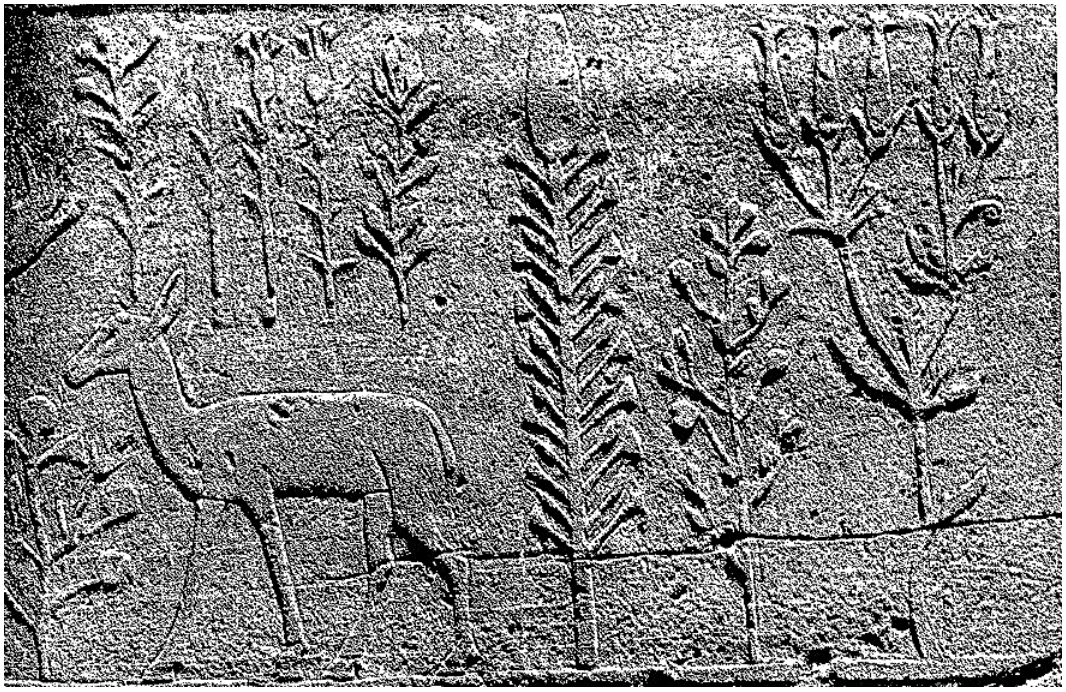
Most endemic and near-endemic taxa belong to Leguminosae, Labiatae, Caryophyllaceae and Compositae which is the largest.

HISTORY OF BOTANICAL STUDIES IN EGYPT.

Botany in Ancient Egypt:

Plants featured heavily in Egyptian culture: in food, medicine, religion, perfumes and beyond. Early medicinal texts, such as the Ebers Papyrus from 1550 BCE, provide detailed insight into their extensive herbal knowledge.

‘Botanical Garden’ was erected in the temple of Akh at Karnak. This ‘garden’ is a chamber whose walls depict carved representations of the plants and animals collected by Thutmose.



History of Botanical Studies in Egypt.

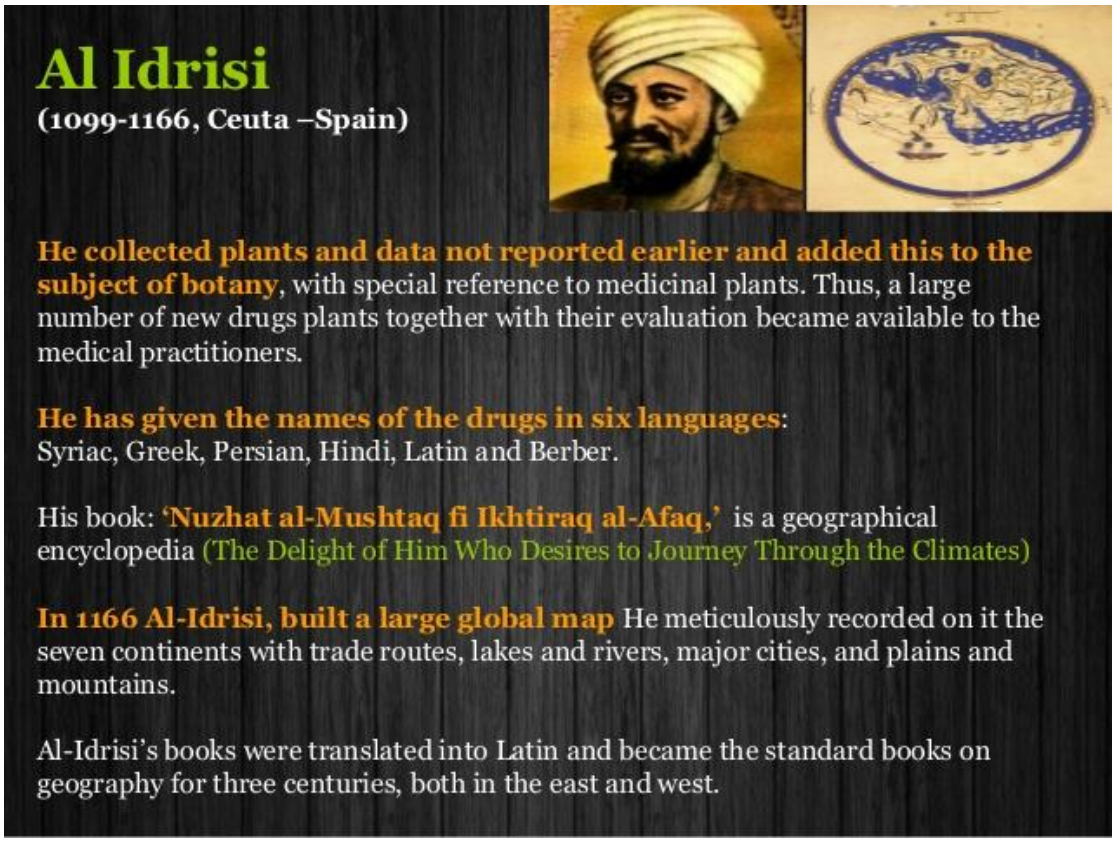
-A.H.Dinawari (895 A.D.) in his book "Kitab al Nabat", had given a comprehensive knowledge of the agriculture and medicinal practices of the Bedouins .

-Other known collectors who lived from tenth to fourteenth centuries, such as Idrisi (1153 A.D.), A. Al-Fida (1331 A.D.) have also written about Arabian plants .

-Subsequently several Muslim travelers and plant collectors visited the country over a period of 500 years or so and studied the vegetation of Arabian countries, with special emphasis on the study of medicinal plants .

- Their

findings have been depicted in various books and reports.



Historical Notes concerned with the Flora of Egypt.

The botanists in modern times who studied in Egyptian flora were:

1- Petter Forsskal, Swedish (1732-1763),

- A pupil of Linnaeus.
- He herborized around Alexandria, Cairo and Suez and then continued to Arabia.
- Some of these plants were described as new in the posthumous publication "Flora Aegyptiaco-Arabica" by Niebuhr (1775).

Cover page of the Forsskal's book (1775)

2 -Alyre Reffenau Delile, French (1778 – 1850) .

He joined Napoleon's expedition to Egypt as a member of the Scientific staff.

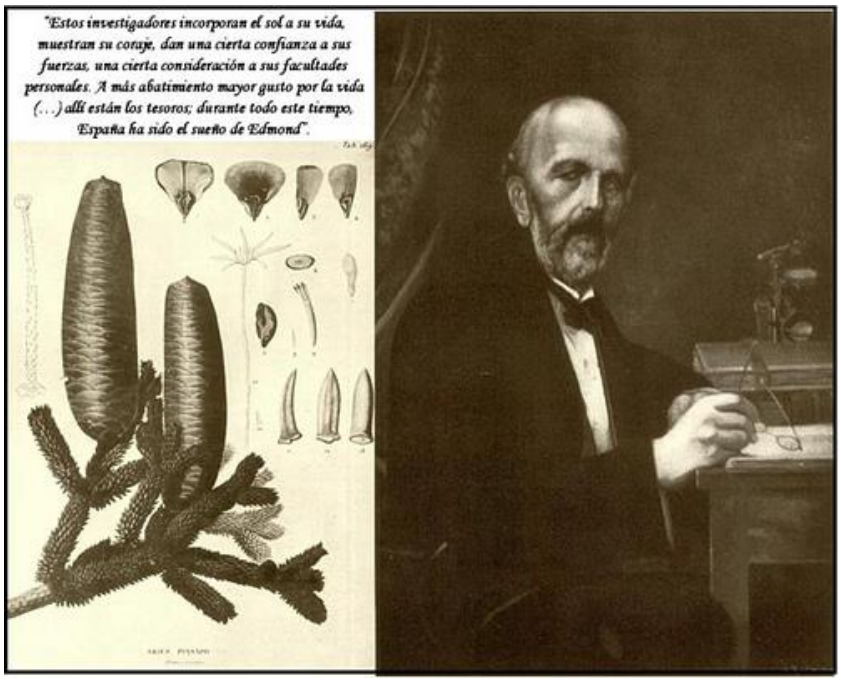
He arived Egypt in 1798 and left again in 1800 in connection with the English occupation of the country.

He succeeded with great difficulties to take with him all the notes on the Egyptian Flora, which appeared in print in 1813 in a beautifully illustrated volume "Flora Aegyptiacae illustratio" accompanied by text "Flora Egypte".

3 -Edmond Boissier, Swiss (1810 - 1850). A citizen of Geneva.

He made many journeys to Spain and also to the Orient.

He spent his life writing a magnificent book in 5 volumes and one supplement, all in Latin, but with flora of all Middle east.



4 -Gearge Schweinfurth , German,(1925 – 1836)

He came to Egypt in 1863 and made a journey down the Red Sea coast.

He made a journey to Africa to exploring and botanizing.

His book “In the heart of Africa” has appeared in 9 languages.

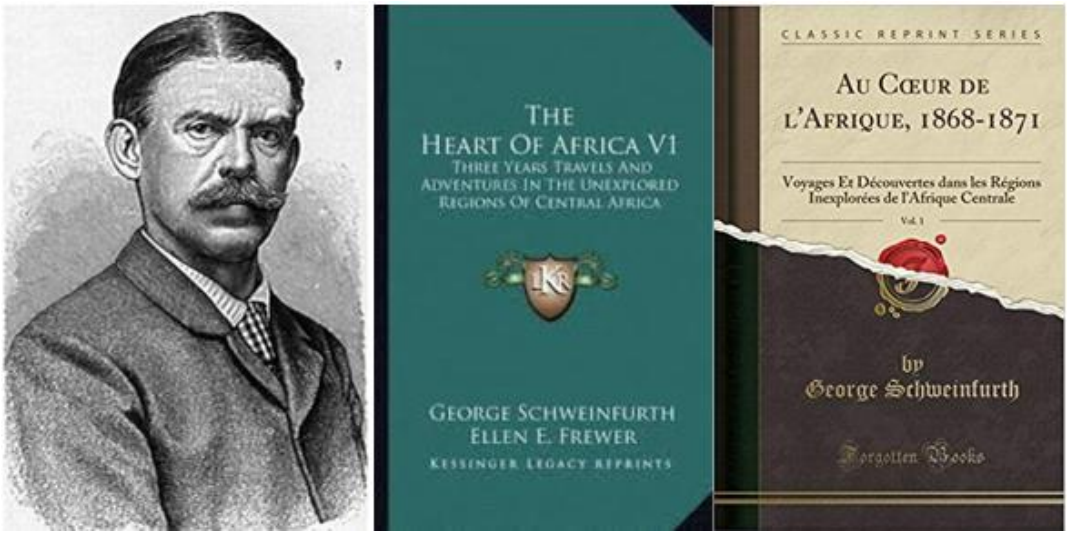
He devoted his time to the exploration of Egypt.

He made 10 great journeys the Arabian Desert.

He visited Kharga and other parts of the Libyan desert.

In 1875 he founded the Royal Geographical Society in Cairo and became the first Chairman.

He was also for some yaers chairman of the Institut d' Egypte.



5 -Ibrahim Ramis, Egyptian , (1928 – 1896)

He was a surgean with Botany as a hobby.

He wrote a book "Bestimmungstahellen Zur Flora von Agyptien", which appeared after his death, 1929.

Ramis collection are kept in the Agricultural Museum, Giza.

6 -Vivi Tāckholm, Swedish (1898 – 1987).

She came to Egypt with her husband Gunnar Tāckholm (1891 – 1933). She was the first Botanist in the Egyptian University (now Cairo University).

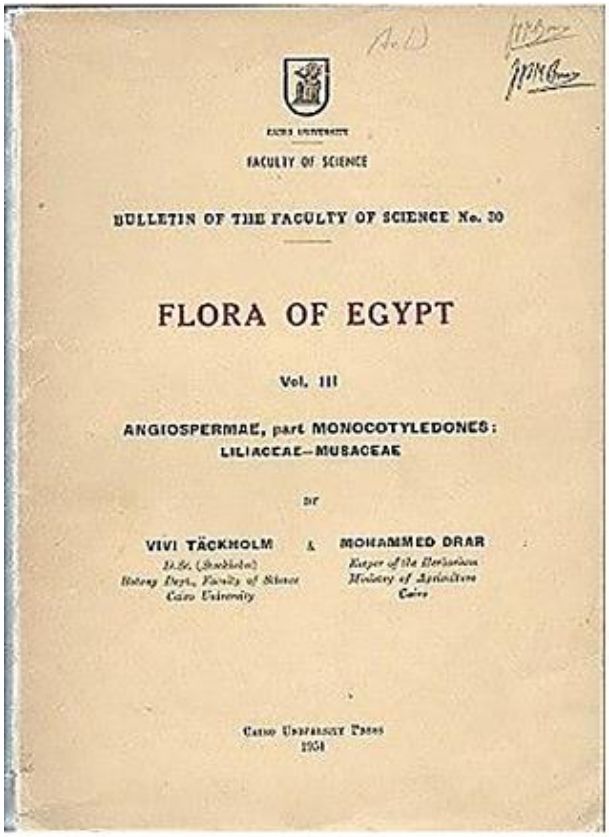
They established the Department of Botany and created its Herbarium.

They joined several expeditions to various parts of Egypt and planes to write the flora of Egypt.

The husband died 1933 and She came back to Egypt to realize that dearm.

She wrote 4 volumes of the flora of Egypt and two editions of the Students Flora of Egypt.

Tell now The school of Vivi Tackholm is still active.



CAIRO UNIVERSITY

FACULTY OF SCIENCE

BULLETIN OF THE FACULTY OF SCIENCE No. 30

FLORA OF EGYPT

Vol. III

ANGIOSPERMAE, part MONOCOTYLEDONES:
LILIACEAE—MUSACEAE

by

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&

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Ministry of Agriculture
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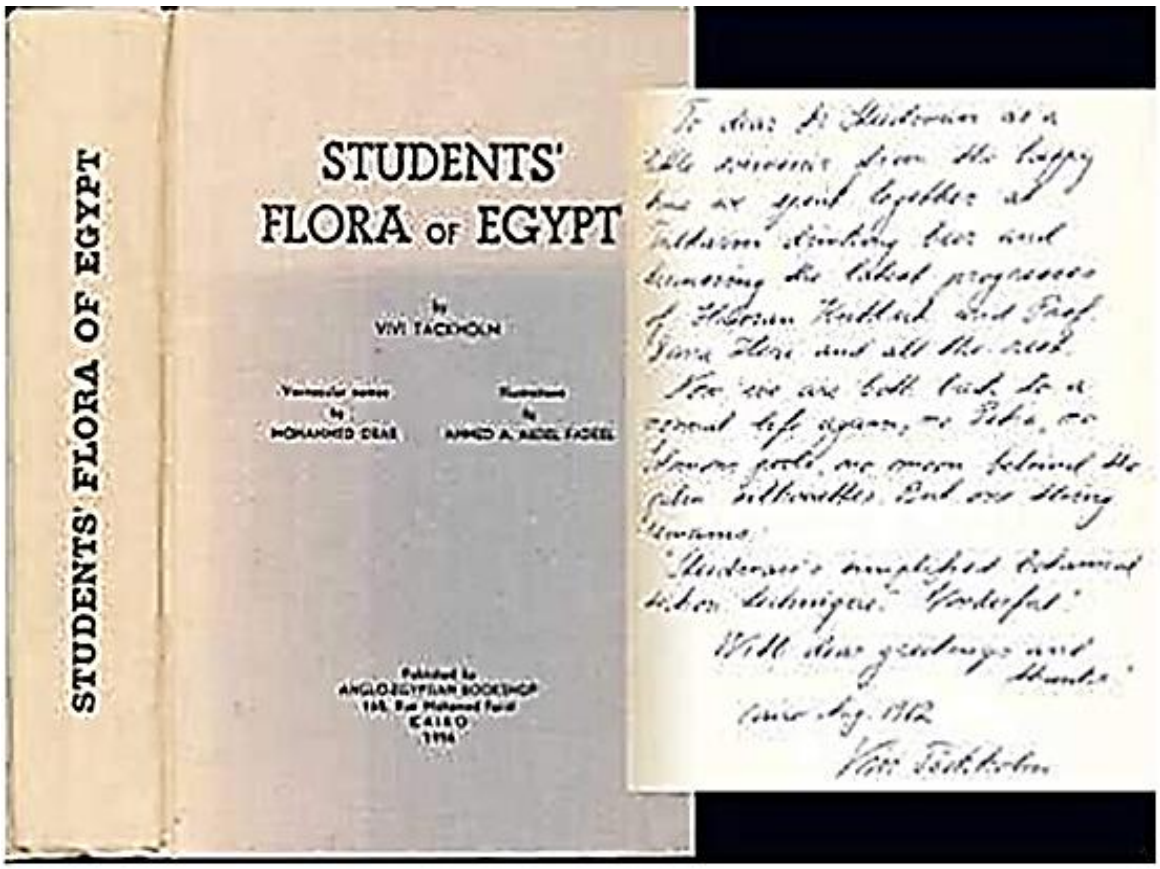
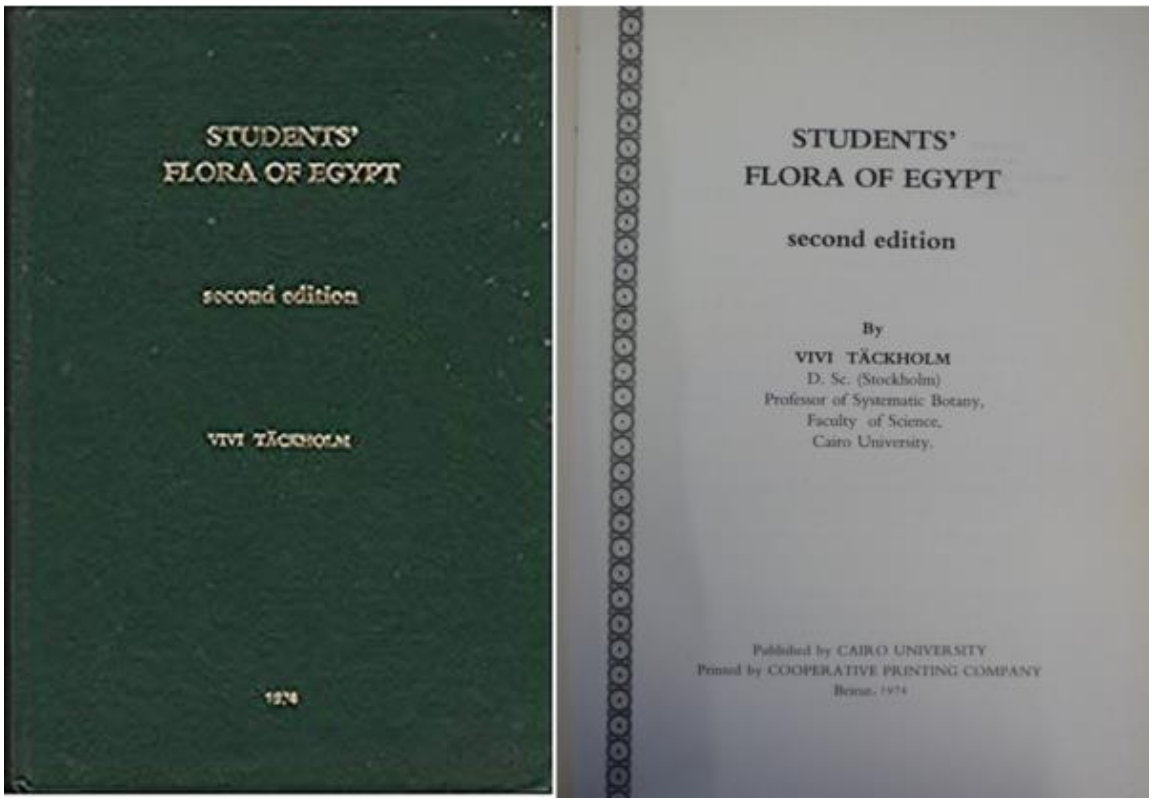
CAIRO UNIVERSITY PRESS
1954





7- Mohammed Nabil El Hadidi (1934-2003).

- He was Keeper of the Cairo Herbarium for 25 years and a world expert on Egyptian flora.

- He was a student of Vivi Täckholm at the University of Cairo.

- He later obtained his PhD from the University of Vienna.

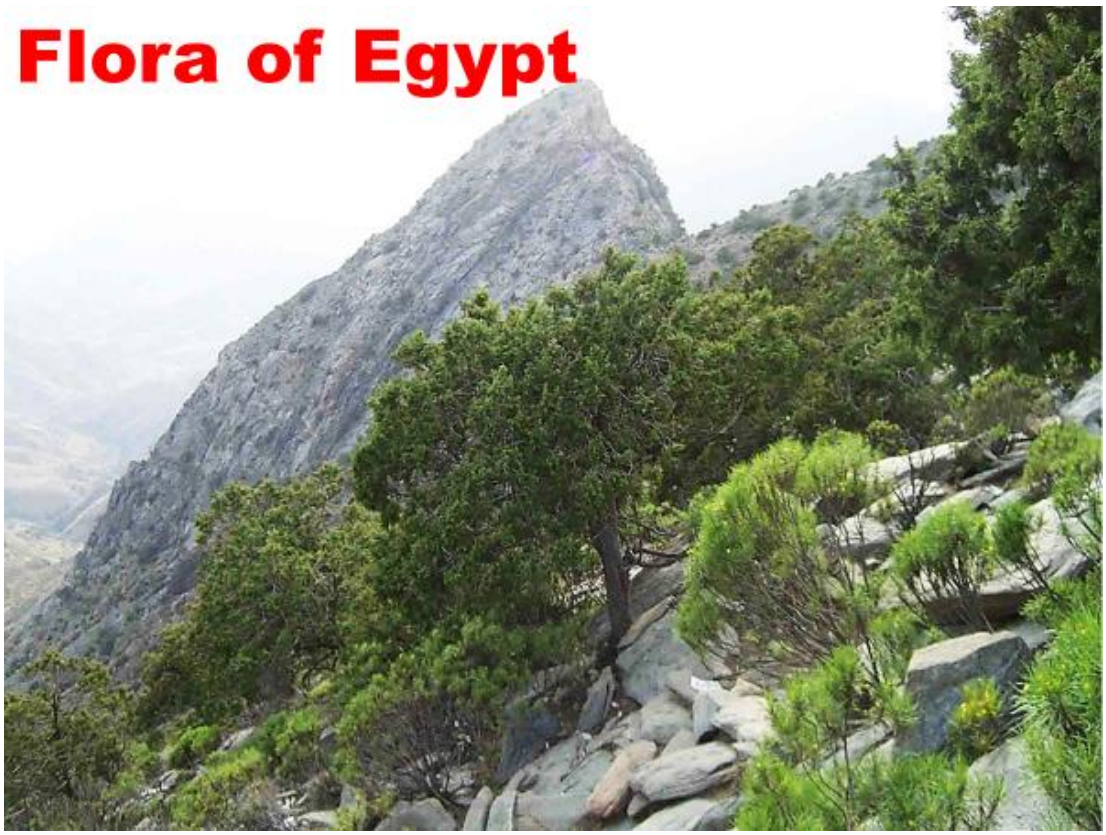
- In 1978 he was elected to succeed Vivi Täckholm in the herbarium.

He was chief editor of Publications of the Cairo University Herbarium (renamed Taekholmia in tribute to its founder).

- He produced more than 80 papers as sole or first author.
- He co-authored three books, two with Loutfy Boulos, The Weed Flora of Egypt (1985) and The Street Trees of Egypt (1988).

- He had recently completed a revised and updated version of Flora Aegyptiaca.

- He was making plans to document the botanical gardens and cultivated plant collections in Egypt.



Flora of Egypt:

-The components of the flora of Egypt are a vital for various ecosystems and play a key role in maintaining the region's environmental balance and stability .

-It also helps in the protection of watersheds, stabilization of slopes, improvement of soils, moderation of climate and the provision تقديم of a habitat for much of our wild fauna.

- The association of man and plants are well known, and the basic needs required for man such as food, clothing, fuel, shelter مأوى and medicine are fulfilled by plants.

-Egypt contains one of the diverse floras of this region .

In addition to the endemic plants, the influences of the surrounding floristic regions can also be seen in many parts of the plant diversity hotspots النقاط الساخنة of this county.

The flora of Egypt has about 2100 species in 755 genera and 129 families of vascular plants .

60 taxa are cited as endemics and 93 taxa are near-endemics i.e. known from Egypt and one neighboring country.

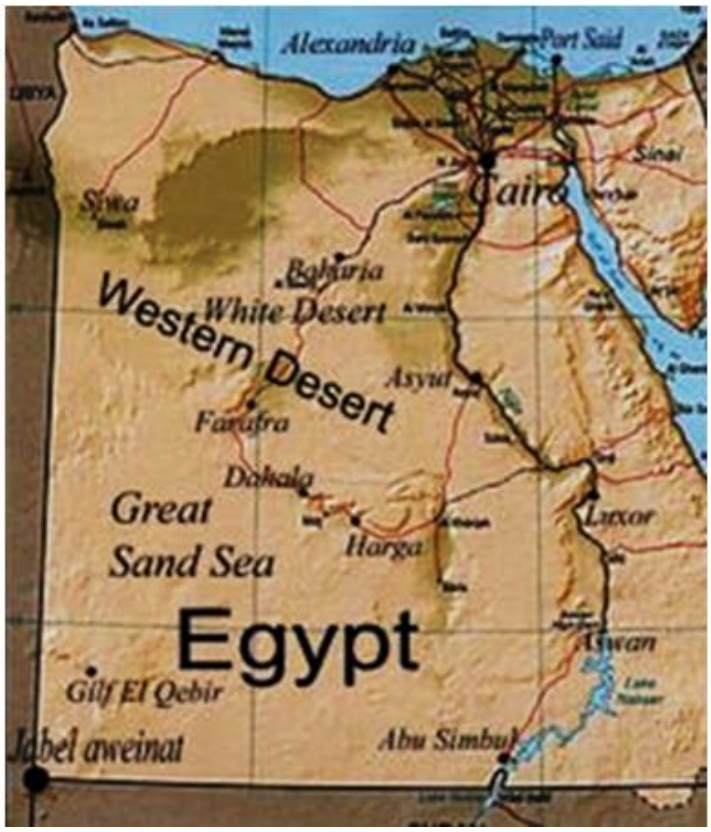
Flora of Egypt:

The western desert of Egypt occurs on the west side of the River Nile.

It extends from the Mediterranean coast in the north to the Egyptian- Sudano border in the south.(1073 ±)

And from the Nile Valley in the east to the Egyptian-Libyan border in the west with width between 600-750 km. It covers about two thirds of Egypt (± 681,000 km2).

The Western desert comprises Three main subregions, namely
1- The western Mediteranean Coast that extends for about 575 km between Sallum in the West to Abu Qir in the east.
2- The Oasis and Depressions
3- Gebel Uweinat.



The Western Mediterranean desert or Mariut is arid desert but with increased rainfall. It may named semi-arid desert.

The vegetation of it is entirely dependent on the rainfall.

The density of vegetation depends on the amount of rain.

Mariut comprises the coastal area from Alexandria to Sallum (575 km long, 25 – 30 km board).

During Predynastic periods the rainfall was richer and there was grass vegetation all over the desert.

When the climate dried up, the cultivation got restricted to the coastal belt, and to the western delta.

Mariut nowadays is a part of the arid desert, but with increased rainfall in the winter, maximum in December – January.

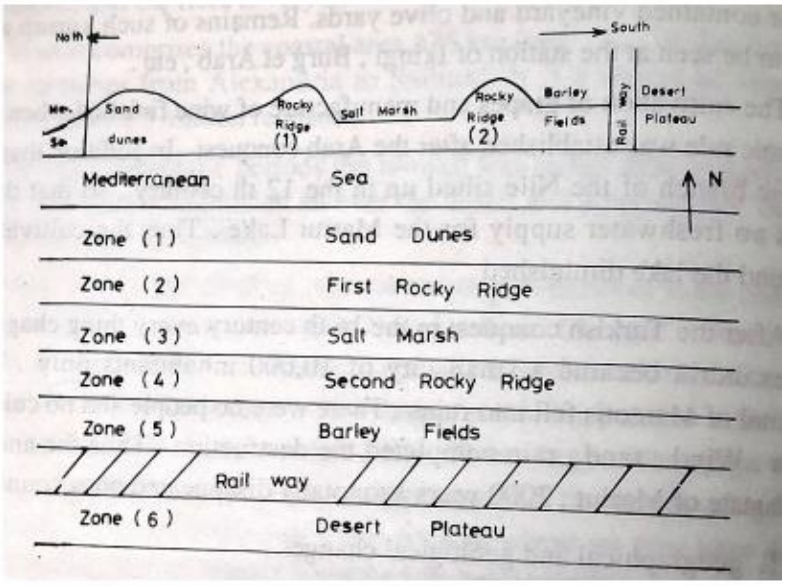
The total amount of rainfall is 5-20 cm yearly.

The humidity is rather uniform, 60 – 75%, and there is dew most part of the year.

Temperature 20-35o in summer, 10-25o in winter.

-Mariut is characterized by 4 main habit types;

Coastal sand dunes, Rocky ridges, salt marshes and barley fields.



View of Mariut coastal area from north to south.

1 -Dunes. Next to the seashore is a snow – white glittering sand dunes. This area is about one mile wide.

The sand is consisting of calcium-carbonate granules.

There are three types of dunes:

a. Small of irregular shape,

b. larger, of 10-20 sqm and 3-4 m high, moving,

c. Fixed dunes, 10 m high of cemented carbonate of lime.

Flora on the seashore:

Number of dried algae washed by the waves

-Posidonia oceanica (Potamogetonaceae) (spherical fiber balls “Pilae marine”).

Ammophila arenaria (sand binder grass in the moving sand).

Ononis vaginalis, Orlaya maritima, Lotus polyphyallos (argenteus), Hyoseris lucida, Silene succulenta ….. etc.

Pancratium maritimium (a bulbous plant “susan”).

Helianthemum sphaerocalyx (rare plant, endemic to Mariut).

In cemented dunes we see:

Crucianella mritima, Echium sericeum, Echiochilon fruticosum ……. etc.

Echinops spinosissimus (acquire a characteristic aspect when growing in maritime dunes).

Posidonia oceanica

Ammophila arenaria

Ononis vaginalis

Orlaya maritima

Lotus polyphyallos

Hyoseris lucida

Silene succulenta

Pancratium maritimium

Helianthemum sphaerocalyx

Crucianella mritima

Echiochilon fruticosum

Echium sericeum

Echinops spinosissimus

2 -Rocky ridges:

They are south of the dune area, two ridges of calcareous hills running parallel to the sea share, covered with sand and clay, with an interesting flora of small rock species.

Along the northern ridge that runs next to the sea there is an extensive fig cultivation.

Among rock plants should be noticed:

Helichrysum conglobatum , Thymus capitatus

Globularia arabica, Phagnalon rupestre, Teucrium polium

Fumana thymifolia Dactylis hispanica

Helichrysum conglobatum

Thymus capitatus

Globularia arabica

Teucrium polium

Phagnalon rupestre

Fumana thymifolia

Dactylis hispanica

Salt Marshes: Between the two ridges, there is a large depression which is an extension of the Mariut Lake.

It is covered with water during the winter and forms a brilliant white sheet of solid salt in summer.

Soil is clayey with gypsum crystals.

On the slopes of marshes is cultivation.

In the middle there are vegetation of marshes plants.

The common flora are:

Halocnemum strobliaceum, Salicornia fruticosa

Frankenia revoluta, Suaeda fruticosa, Cressa cretica

Limonium pruinosum, Limoniastrum monopetalum,

Sphenopus divaricatus

Halocnemum strobliaceum

Salicornia fruticosa

Frankenia revoluta

Suaeda fruticosa

Cressa cretica

Limonium pruinosum

Limoniastrum monopetalum

Sphenopus divaricatus

Flora of Egypt - Monocot flora

4 -Flora of the Barley fields:

The soil here is loose and cultivated by the Bedouins with Barely.

These Barely fields have rich weed flora depend on rain.

The weed flora in Mariut dominated by 4 families:

Compositae (c. 100 species).

Leguminosae (c. 100 species).

Gramineae (c. 100 species).

Cruciferae (c. 50 species).

Important Plants:

Lolium temulentum

Convolvulus althaeoides

Asphodelus microcarpus

Cynara sibthorpiana

Mesembryanthemum crystallinum

Alkanna tinctoria

Achillea santolina

Lygeum spartum

Fagonia cretica

Bupleurum subovatum

Eryngium campestre

5 .Fruit trees cultivated in Burg el Arab and suitable for Mariut.

Some fruit trees that can be cultivated in Mariut and suited for the climate of this region:

Fig: It grows extremely in the Sandy dunes all along the Coast.

Kharroub: is resistant to drought and salt.

Almond: is also resistant to drought and salt.

Nabq (Ziziphus): produces heavy crops.

Olive: It is the best suited tree for cultivation along the coast.

It is could grow without irrigation and could stand a rainless year.

-As a result of these developments, large areas of virgin land in the mountainous regions and the range lands in the Northern, Eastern and Central regions are turned into urban and agricultural lands .

- In addition to this, the dramatic fluctuations in climate which resulted in periodic drought have made it much more difficult for plants to survive in their habitats.

Ficus sycomorus Ceratonia siliqua Prunus dulcis

Ziziphus spina-christi Olea europaea

List Of Some Selected Species Of The Habitats of Mariut Coastal Area

a) Sandy Dunes

Ammophila arenaria , Euphorbia paralias , Lotus argentus , Sporobolus pungens, Crucianella maritima, Ononis vaginalis, Echinops spinosissimus, Silene succulenta , Reseda alba, Pancratium maritimum, Hyoseris lucida, Launaea tenuiloba, Echium sericeum, Salvia lanigera, Cakile maritima, Plantago albicans, Lygos raetam, Agropyron junceum Thymelaea hirsuta, Urginea maraitima, Gymnocarpos decandrum , Globularia arabica, Plantago squarrosa etc .

b) Rocky ridges:

Thymelaea hirsuta, Gymnocarpus decandrum, Helianthemum stipulatum

latum, Lotus corniculatum, Herniaria hemistemon, Scorzonera alexandrina, Carduus gebulus, Plantago notata, Lygeum spartum, Stipa capensis, Limonium tubiflora, Medicago minima, Malva aegyptiaca , Reaumuria hirtella , Teucrium polium , Lotus creticus , Arisarium vulgare , Reichardia orientalis , Orlaya maritima , Nonnaea viviana , Moricandia suffruticosa , Thymus capitatus , Echinops spinosissimus , Pituranthus tortuosus , Asphodelus microcarpos , Hammada articulatum , Anabasis articulata , Stipa capensis , Noaea mucronata etc .

c) **Non - Saline areas**

A chillea santolina , chrysanthemum coronaria , Eryngium creticum , Calendula aegyptiaca , Thymelaea hirsuta , Plantago albicans , Papaver rhoses , Onopordon alexandrinum , Asphodelus microcarpus , Linaria haelava , Avena sterilis , Emex spinosus , Echiochilon fruticosum , Papaver hybridum , Emex spinosus , Beta maririma , Limonium tubiflorum , Hippocrepis bicontorta , Ranunculus asiaticus , Urginea undulata , Arisarum vulgare , Planntago crypsioides , Francoeuria crispa , Allium erdelli , Anagaellis arvensis , Daucus syrticus , Echinops spinossismus , Vicia cinera , Lathyrus cicera , Hordeum marinum , Atriplex halimus , Malva parviflora , Lycium europaeum , Reseda alba , Centauraea pumila , Lotus creticus , Hyoseris lucida , Helianthemum ellipticum , Astragalus mareoticus , Erodium hirtum , Moricandia nites , Silene villosa , Ifloga spicata , Buplerum subovatum , Gagea fibrosa , Scorzonera alexandrina , Beta maritima , Avena sterilis , Odontospermum graveolens , Medicago littoralis , Reseda decursica , Brassica tournefortii , Lolium perenne , Astragalus forskalei , Alkanna tinctoria , Artemisia inculta etc .

d) **Saline Areas**

Limoiastrum monopetalum , Juncus rigidus , Halimione portulacoides , Cressa cretica , Arthrocnemum glaucum , Salicornia frduticosa , Halocnemum strobilaceum , Limonium pruinosum , Atriplex halimus , Sprobolus pungens , Suaeda salsa , Inula crithmoides , Sphenopus diviricatus , Zygophyllum album , Frankenia pulverulenta , Mesembryanthemum nodiflorum , Suaeda pruinosa ; Suaeda fdruticosa .

In the swampy areas : *Phragmites australis ,Typha domingeansis , Cyperus* spp , *Juncus acutus J. Subulatus* etc .

The sea weeds include : *Zostera nara , Cymodocea nodosa , Posidonia oceanica* etc .

MARIUT FLORA

There are about 850 species known from the Mariut area . The following are the most common .

1 - Aizoaceae :

Aizoon hispanicum

Mesembryanthemum nodiflorum, M. Crystallinum .

2 - Amaryllidaceae :

Pancratium maritimum

Araceae :

Arisarum veslingii

Eminium spiculatum

3 - Boraginaceae :

Moltkea callosa

(= Moktlkiopsis ciliata)

Echiochilon fruticosum .

Echium setosum

E. sericeum

Alkanna tinctoria

Gastrocotyle hispida

Anchusa aegyptiaca

4 - Compositae :

Echinops spinosissimus

Carduus getulus

Atractylis flava

Onopordon alexandrium

Carthamus glaucus

C. mareoticus

Centaurea pumila

C. glomerata

C. alexandrina

Erigeron crispus

Filago spathulata

F. mareotica

Gymnarrhena micrantha

Phagnalon rupestre

Helichrysum conglobatum

Inula crithmoides ,Varthemia candicans

Pallenis spinosa

Anthemis microsperma

Anacyclus alexandrinus

Achillea santolina

Diotis maritima

Matricaria aurea

M. tridentata

Chrysanthemum coronar ium

Senecio desfontainei

Calendula micrantha

Hyoseris lucida

Hedypnois rhagadioloides

Urospermum picroides

Thrincia tuberosa

Picris radicata

Scorzonera alexandrina

launaea capitata

L. nudicaulis

L. resedifolia

Reichardia orientalis

Sonchus oleraceus

Aetheorrhiza bulbosa

Crepis sencioides

5 - Cyperaceae :

Cyperus leavigatus

C. capitatus

C. rotundus, Carex divisa

6 - Euphorbiaceae :

Euphorbia peplus

E. terracina

E. paralias

7 - Frankeniaceae :

Franknia revoluta

F. pulverulenta

8 - Geraniaceae :

Erodium hirtum

E. laciniatum

E. gruinum

E. cieonium

9 - Globulariaceae :

Globularia arabica

10- Caryoply llaceae

Spergularia marirna

S. diandra

Stellaria pallida

Minuartia procumbens

Polycarpon succulentum

Herninaria hemistemon

H. hirsuta

Parronychia arabica

P. nivea

Gymnocarpos decandrum

Silene succulenta

S. colorata

S. biappendiculata

11 - Chenopodiaceae :

Noaea mucronata

Beta vulgaris

Chenopodium murale

Blackiella inflata

Halimione portulaeoides

Atriplex stylosa

A. halimus

A. coriacea

Halocnemum strobilaceum

Salicornia fruticosa

Suaeda fruticosa

S. pruinosa

Salsola tetrandra

S. longifolia

S.kali

S.villosa

Kochia indica

12- Convolvulaceae :

Convolvulus arvensis

C. althaeoides

Cuscuta planiflora

13. Cruciferae

Matthiola humilis

koniga arabica

Erucaria microcarpa

E. hispanica

Carrichtera annua

Moricandia nitens

Brassica turnefortii

14 - Gramineae

Bromus scoporius

B. rubens

B. rigens

B. fasciculatus

Trachynia distachya

Ammophila arenaria

Sporobolus arenarius

Polypogon monspeliensis

Stipa capensis

Cynodon dactylon

Phalaris minor

P. paradoxa

Cutandia memphitica

C. dichotoma

Sphenopus divaricatus

Aeluropus lagopoides

Dactylis hispanica

Lamarckia aurea

Phragmites australis

Elytrigia juncea
(Elymus elongatus)

Aegilops bicornis

A. kotschyi

Hordeum leporinum

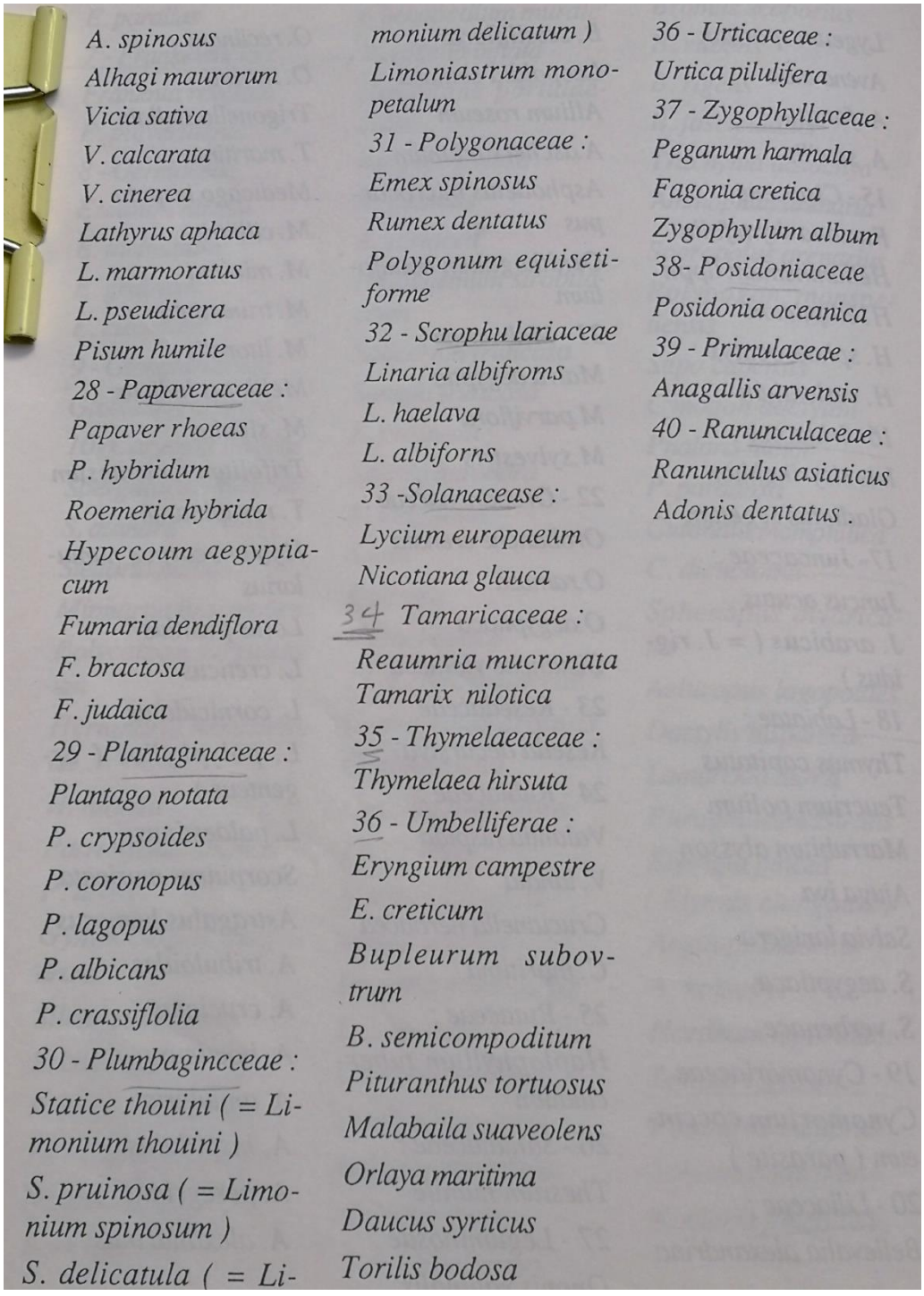
Lolium rigidum

Pholiurus incurvus

Schismus barbatus

Koeleria phleoides

Lygeum spartum
Avena alba
A. fatua
A. sterilis
15 - Cistaceae :
Fumana thymifolia
Helianthemum lippii
H. ellipticum
H. sphaerocalyx
H. vesicatium
16 - Iridaceae :
Iris sisyrinchium
Gladiolus segetum
17- Juncaceae :
Juncus acutus
J. arabicus (= J. rigidus)
18 - Labiatae :
Thymus capitatus
Teucrium polium
Marrubium alysson
Ajuga iva
Salvia lanigera
S. aegyptiaca
S. verbenace
19 - Cynomoriaceae :
Cynomorium coccineum (parasite)
20 - Liliaceae :
Bellevalia alexandrina
B. sessiliflora
Leopoldia comosa
Allium roseum
A.aschersonianum
Asphodelus microcarpus
Ornithogalum tenuifolium
21 - Malvaceae :
Malva aegyptia
M.parviflora
M.sylvestris
22 - Orobanchaceae :
Orobanche crenata
O.ramosa
O.aegyptiaca
Cistanche violacea
23 - Resedaceae
Reseda decursiva
24 - Rubiaceae :
Valantia hispida
V. lanata
Crucianella herbacea
C. maritima
25 - Rutaceae :
Haplophyllum tuberculatum
26 - Santalaceae :
Thesium humile
27 - Leguminosae
Ononis vaginalis
O. reclinata
O. serrata
Trigonella stellata
T. maritima
Medicago hispida
M. cilliaris
M. minima
M. truncatula
M. litoralis
Melilotus indicus
M. siculus
Trifolium tomentosum
T. resupinatum
Hymenocarpus numularius
Lotus pusillus
L. creticus
L. corniculatus
L. polyphylios (argenteus)
L. palaestinus
Scorpiurus muricata
Astragalus hamosus
A. tribuloides
A. cruciatus
A. boeticus
A. annularis
A. hispidulus
A. peregrinus
A. alexandrinus



A. spinosus
Alhagi maurorum
Vicia sativa
V. calcarata
V. cinerea
Lathyrus aphaca
L. marmoratus
L. pseudicera
Pisum humile
28 - Papaveraceae :
Papaver rhoeas
P. hybridum
Roemeria hybrida
Hypecoum aegyptiacum
Fumaria dendiflora
F. bractosa
F. judaica
29 - Plantaginaceae :
Plantago notata
P. crypsoides
P. coronopus
P. lagopus
P. albicans
P. crassiflolia
30 - Plumbagincceae :
Statice thouini (= Limonium thouini)
S. pruinosa (= Limonium spinosum)
S. delicatula (= Limonium delicatum)
Limoniastrum monopetalum
31 - Polygonaceae :
Emex spinosus
Rumex dentatus
Polygonum equisetiforme
32 - Scrophu lariaceae
Linaria albifroms
L. haelava
L. albiforns
33 -Solanacease :
Lycium europaeum
Nicotiana glauca
34 Tamaricaceae :
Reaumria mucronata
Tamarix nilotica
35 - Thymelaeaceae :
Thymelaea hirsuta
36 - Umbelliferae :
Eryngium campestre
E. creticum
Bupleurum subovtrum
B. semicompoditum
Pituranthus tortuosus
Malabaila suaveolens
Orlaya maritima
Daucus syrticus
Torilis bodosa
36 - Urticaceae :
Urtica pilulifera
37 - Zygophyllaceae :
Peganum harmala
Fagonia cretica
Zygophyllum album
38- Posidoniaceae
Posidonia oceanica
39 - Primulaceae :
Anagallis arvensis
40 - Ranunculaceae :
Ranunculus asiaticus
Adonis dentatus .

Flora of a Sector along the Western Desert

Along the western desert the plant life varies due to the variation of the climatic conditions.

The amount of rainfall increases towards Alexandria from 24 mm/ year in Giza, 38 mm in Tahrir Proview, 138 mm in Ameriya, to about 170 mm in Alexandria.

Air temperature decreases north-word, relative humidity increases, and evaporation decreases north-words.

In the extreme southern part of the Sector the Plant cover is very poor.

Few scattered individuals of Aristida plumosa, Calligonum comosum, Eremobium lineare and Zygophyllum coccineum.

After 46 km north of Cairo the number of plants increases and the flora include: Aristida plumosa, Pituranthus tortuosus, Artemisia monosperma, Helianthemum lippii …… etc. This flora continues till km 157 of Cairo, then new elements start to appear eg. Thymelaea hirsuta, Anabasis articulata, Salsola tetrandra ……etc.

The number of plants and the density of vegetation increases near the coast.

THE OASIS AND DEPRESSIONS OF THE WD

The WD of Eg. is characterized by a number of Oases and Depressions:

e. g. Siwa, Moghra, Baharia, Farafra, Dakhla, Kharga, KurKur and Dungul Oases; Qattara, Wadi El-Natrun and Wadi El-Rayan Depressions.

The climatic conditions of these Oases and Depressions are arid or extreme arid : high temperature, low humidity, high evaporation and rainfall is negligible.

Thus, the under ground water is the main water resources of these depressions which can be obtained by digging wells or from natural springs .

Natural lakes are present in many of these Oases e.g. Siwa lake, Wadi El-Natrun Depression Lakes ……. etc.

Five vegetation's types can be recognized in these Oases and Depressions namely Hydrophytes, Helophytes, Halophytes, Psammophytes and Xerophytes.

A + b. Hydrophytes and Helophytes:

The swampy habitats are formed by the overflowing of the underground water to the depressed areas of these Oases.

Hydrophytes grow in filled with water Lakes and Lagoons.

Helophytes are present in shallow watered edges of these water bodies.

e.g. of Hydrophytes: Typha domingensis, Phragmites australis, Typha elephantina (restricted to Wadi El-Natrun). Also Cyperus papyrus, Berula erecta, Samolus valerandii, Cyperus articulatus …….etc.

Typha domingensis

Phragmites australis

Typha elephantina

Berula erecta

Samolus valerandii

Cyperus papyrus

Cyperus articulatus

The wet fringes of these lakes and lagoon are suitable for growth of : Cyperus laevigatus, Juncus acutus, J. rigidus, Panicum repens ……. etc.

Cyperus laevigatus

Juncus acutus

Juncus rigidus

Panicum repens

The Halophytes (the flora of salt marsh habitat) are widely present in the oases and depressions of the WD of Egypt.

e.g. Cladium mariscus (present only in Siwa Oasis), Cyperus laevigatus (forms meadows around the lakes of Wadi El-Natrun), Juncus rigidus, J.

acutus, (both are present in all Oases), Nitraria retusa, Zygophyllum album, Cressa cretica, Alhagi maurorum, Tamarix nilotica, Saueda monoica, ……etc.


Cladium mariscus


Cyperus laevigatus


J. acutus


Juncus rigidus


Tamarix nilotica


Nitraria retusa


Zygophyllum album


Cressa cretica


Alhagi maurorum


Saueda monoica

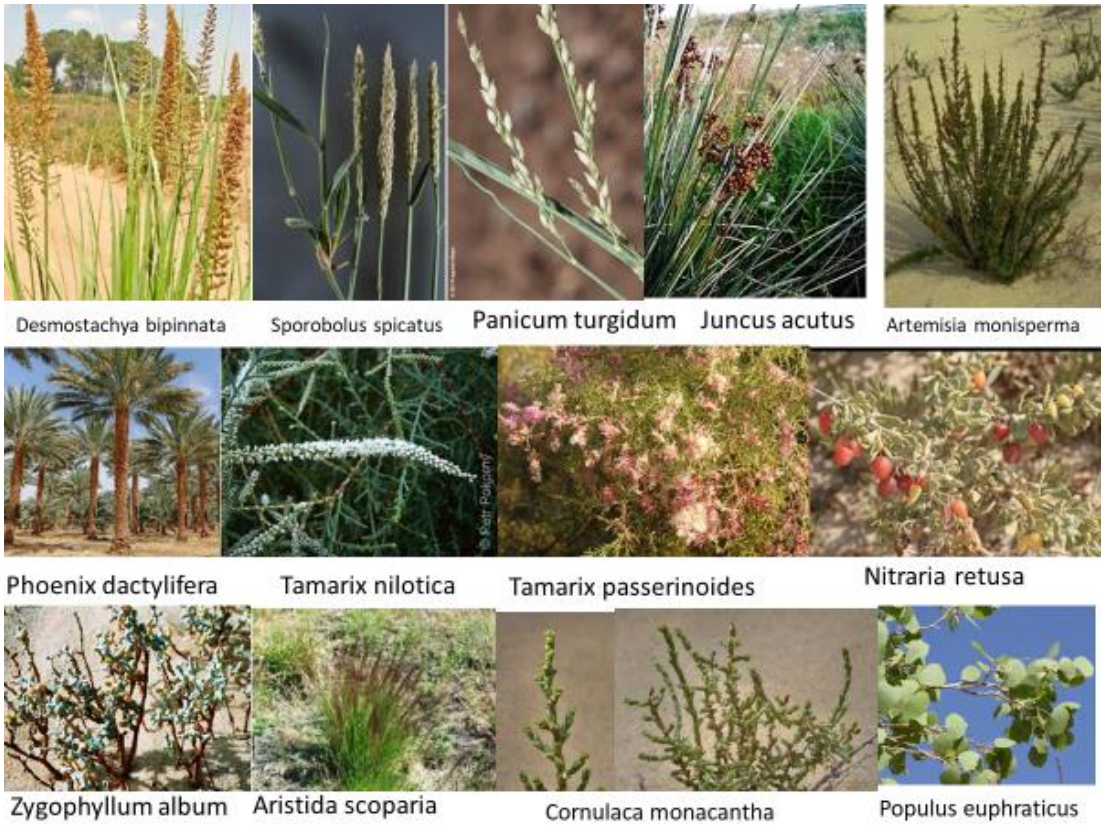
- Psammophytes (these are the plants that inhabit the sand formations):- Sand bars, sand hillocks and sand dunes are usually associated with the lakes of Oases and Depressions.

In Wadi El-Natrun there are sand bars on the eastern side dominated by Desmostachya bipinnata, Sporobolus spicatus, Panicum turgidum, Juncus acutus, Artemisia monisperma and Phoenix dactylifera.

On the western side, there are sand hillocks with Tamarix nilotica, T. passerinoides, and Nitraria retusa.

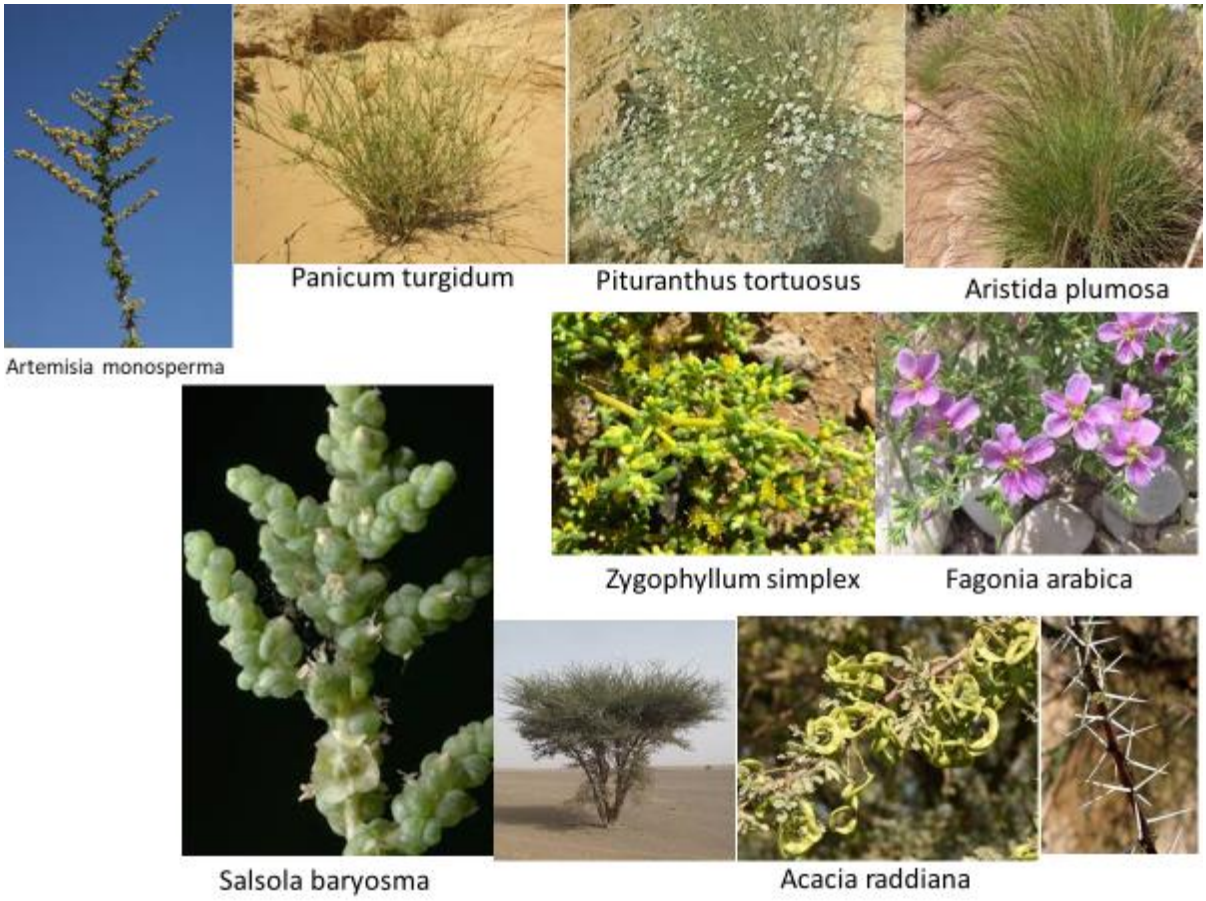
On the south and southeastern sides of lake Siwa there are extensive area of huge sand dunes where, Zygophyllum album, Aristida scoparia, and

Cornulaca monacantha gow. Also Populus euphraticus (most interesting plant present only in Siwa Oasis).



- Xerophytes:

The lands surrounding the Oases and depressions of the WD of Egypt are characterized by perennials Xerophytes. These include: Artemisia monosperma, Panicum turgidum, Pituranthus tortuosus, Aristida plumosa, Salsola baryosma, Zygophyllum simplex, Fagonia arabica, Acacia raddiana …….. etc.



III. Gebel Uweinat:

It lies in the extreme southwestern portion of the WD where the boundaries of Egypt, Sudan and Libya meet.

The flora of Gebel Uweinat: Phoenix dactylifera, Hyphaene thebaica, Tamarix nilotica (grows near the springs and wells).

Under Palms, there are Halophytes like Junicus rigidus, Sporobolus spicatus, Imperata cylinderica, Alhagi maurorum……. etc .

In Swampy patches grow Phragmites australis.

Xerophytes include: Cassia italica, Aerva javonica, Francoeuria crispa …….. etc.

The Eastern Desert of Egypt (ED)

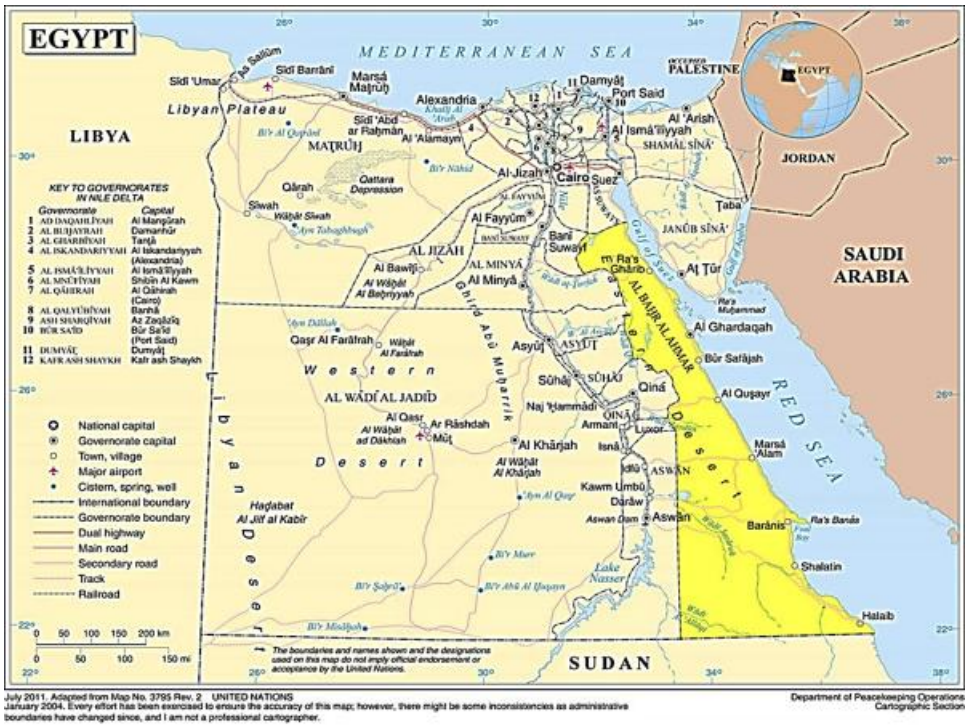
It occupies the area extends from the Nile Valley eastern to the Gulf of Suez and the Red Sea which is about 223,00 km2.(%21)

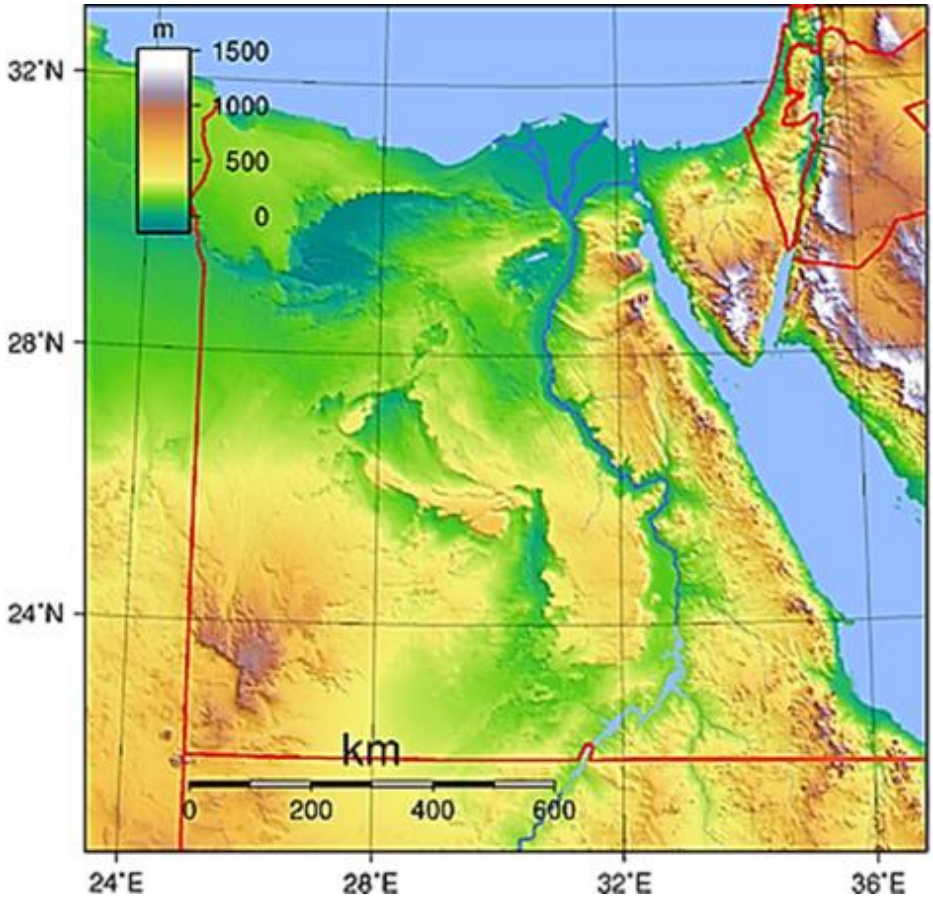
It is higher than the WD and it consists essentially of a backbone of high and rugged mountains running parallel to the coast. E.g. Ataqa, Shayeb El-Banat, Elba ……etc.

The Mountains divide the ED into two main subregions:

The Red Sea coastal land,

The Inland Desert.





The Red Sea Coastal Land of Egypt (RSCL):

RSCL extends from Suez southwards to Marsa Halaib at the Sudano-Egyptian border for about 1100 km.

It comprises the western coast of the Gulf of Suez (from Suez to Hurghada, about 400 km) and the northern section of the western coast of the Red Sea (from Hurghada to Marsa Halaib, 700 km).

This coastal area is situated within a region of arid climate with rainfall ranges between 3 – 25 mm.

The Red Sea Coastal Land of Egypt (RSCL):

In the mountains area, there is orographic rain which has its effect on its flora: richer flora than the coastal desert of the Red Sea and other parts of the Egyptian deserts.

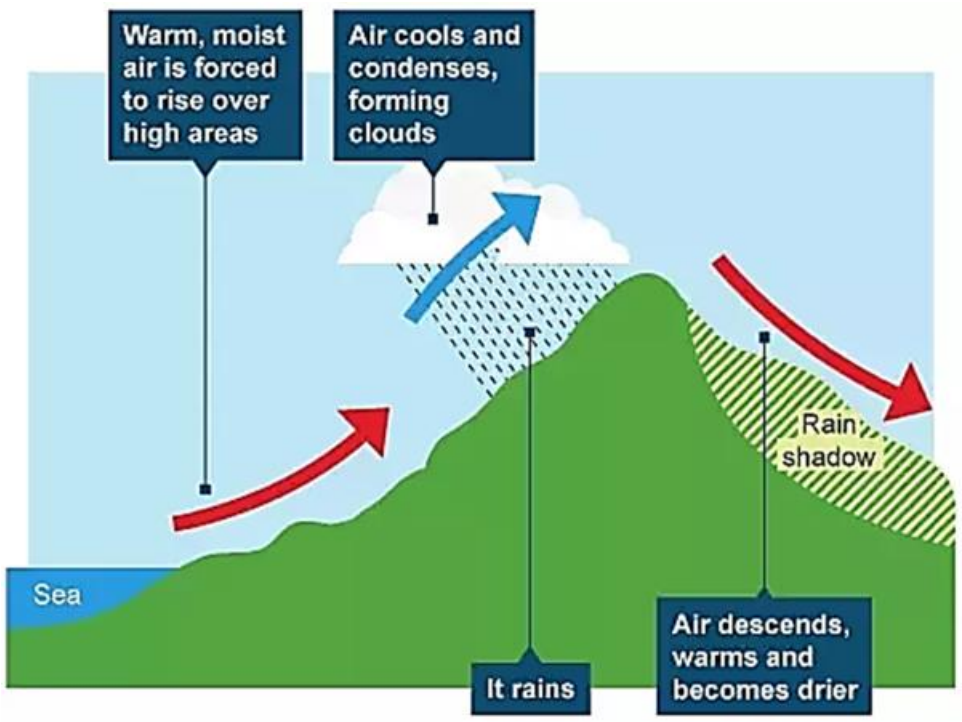
Four vegetation types have been recognized in RSCL.

A- Mangrove Vegetation ,

B- Littoral Salt Marsh Vegetation,

C- Coastal Desert Vegetation ,

D- Mountainous Vegetation.



The Mangrove vegetation is present only along the Red Sea coast.

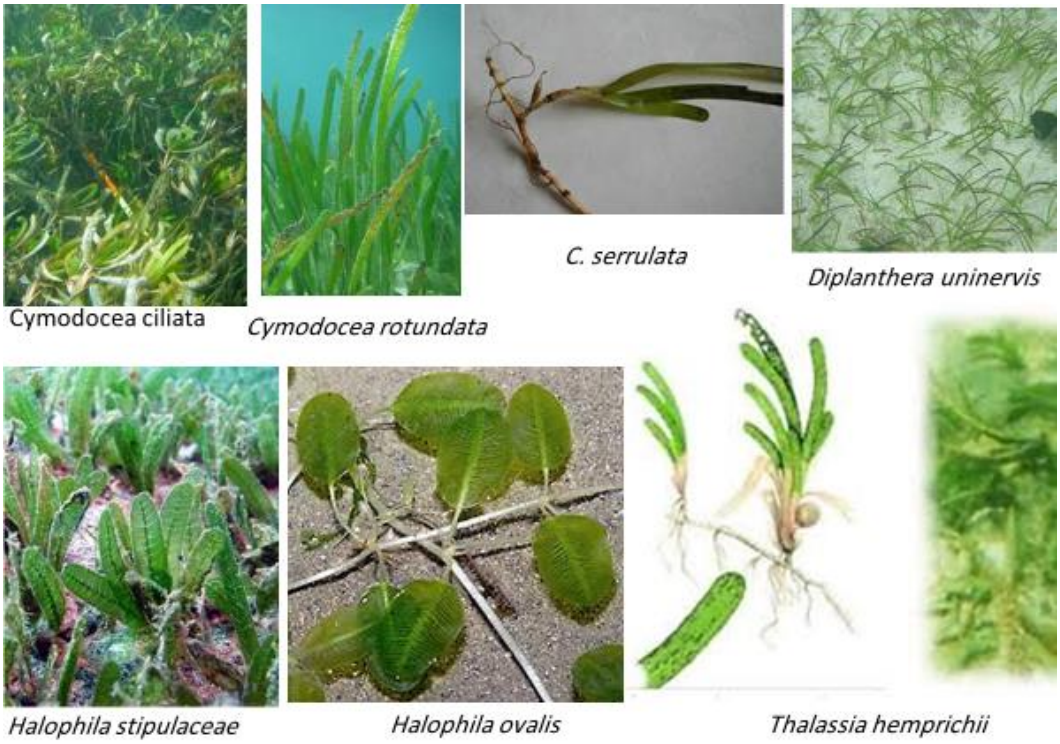
It is represented by common tree Avicennia marina (Avicenniaceae), that appears from Hurghada southwards, absent in the north.

Also, Rhizophora mucronata (Rhizophoraceae) in the most southern part of the Red Sea Coast of Egypt.

Avicennia marina

Rhizophora mucronata

Several Sea weeds are constantly washed up on the shores among which are: Cymodocea ciliata, Cymodocea rotundata, C serrulata (Cymodoceaceae), Diplanthera uninervis (Cymodoceaceae), Halophila stipulaceae, H. ovalis, Thalassia hemprichii (Hydrocharitaceae).



Ain Sokhna is a hot water spring, characterized by a salt marsh vegetation (Halophytes), its flora includes: Juncus rigidus, Cressa cretica, Arthrocnemum glaucum, Halocnemum strobilaceum, Nitraria retusa, Tamarix nilotica and Phragmites australis (dominated in water creeks).

The salt marsh vegetation occupies the land parallel to sea water and comprises halophytes communities dominated by: Halocnemum strobilaceum, Arthrocnemum glaucum, Salicornia fruticosa, Limonium pruinosum, Zygophyllum album, ……. etc.

Juncus rigidus

Cressa cretica

Arthrocnemum glaucum

Halocnemum strobilaceum

Nitraria retusa

Tamarix nilotica

Phragmites australis

Salicornia fruticosa

Limonium pruinosum

Zygophyllum album

Also, Nitraria retusa, Tamarix nilotica, Suaeda monoica, Juncus rigidus, Alhagi maurorum.

The water creeks are suitable habitat for the growth of swamp plants e.g. Typha domingensis and Phragmites australis.

Typha domingensis

Phragmites australis

Nitraria retusa

Tamarix nilotica

Juncus rigidus

Suaeda monoica

Alhagi maurorum

RSC desert is dissected by several Wadis run eastward towards the red sea.

In these Wadis many Xerophytic plants grow like: Cleome droserifolia, Hammada elegans, Anabasis articulata, Zygophyllum coccineum, Lindenbergia sinaica, Capparis decidua, Zilla spinosa, …….etc.

The forest vegetation is present in the mountainous area of RSCL particularly in Gebel Elba area(height 1436 m).

Cleome droserifolia

Hammada elegans

Anabasis articulata

Zygophyllum coccineum

Lindenbergia sinaica

Capparis decidua

Zilla spinosa

Gebel Elba is the only mountainous area in Egypt with a forest vegetation mainly consisting of Acacia trees intermingled with Moringa peregrina and Balanites aegyptiaca.

In the shaded areas grow e.g. Ficus pseudosycomorus, Olea chrysophylla, Delonix elata, Dodonaea viscosa, …….etc.

The most interesting plant of Gebel Elba is Dracaena ombet (Liliaceae).

The other with ecological interest plant is Caralluma retrospiciens (Asclepiadaceae).

Acacia trees

Moringa peregrina

Balanites aegyptiaca

Ficus pseudosycomorus

Olea chrysophylla

Delonix elata

Dodonaea viscosa

Dracaena ombet

Caralluma retrospiciens

Of the Acacia plants of Gebel Elba is the Liana Loranthus acaciaea, which live on these trees.

Ferns are represented with a number of small rock species e.g. Adiantum sp.

Loranthus acaciaea

Adiantum sp.

2-The Inland Desert (ID)

It is part of the ED of Egypt, located between the range of the coastal mountains and the Nile River.

It is characterized by several Wadis (Hof, Qena, Allaqi), that run towards the River Nile and some northward cutting Cairo – Suez Desert Road bordering this inland desert from the north.

Cairo – Suez Desert Road:

It is a wide-open desert with low hills covered with pebbles.

It is described as “Gravel Desert” which is sterile.

The vegetation is located to smaller and larger water courses filled with wind-borne sand originating partly from the mobile dunes.

In the beginning, the sandy courses show a flora of small ephemerals: e.g. Stipa capensis, Schismus barbatus.

When the sand sheet gets a little thicker, Perennial grasses take place of the ephemerals like Panicum turgidum and Lasiurus hirsuts, where small sand hills are accumulating around them.

With increasing in the soil thickness, the shrubs appear like: Hammada elegans competes with Panicum turgidum, Retama raetam, Convolvulus lanatus, Farsetia aegyptia, Zilla spinosa ..etc.

The next stage will be represented by a climax stage with a vegetation of Acacia trees.


Stipa capensis


Schismus barbatus


Panicum turgidum


Lasiurus hirsuts


Hammada elegans


Panicum turgidum


Retama raetam


Convolvulus lanatus


Farsetia aegyptia


Zilla spinosa

In rainy years, a very rich flora along the Suez road of small ephemerals (annuals) appears, dominates with Mesembryanthemum forsskaolii.

Other very common ephemerals: Matthiola livida, Neurada procumbens, Arnebia tinctoria, Centaurea pallescens, Filago spathulata, Plantago ovata ……..etc.

All of them are herbaceous, mesophytic and have a very rapid development which allows them to flower and produce seed before the hot season sets in.

Some bulbous plants along Suez road: e.g. Pancratium sickenbergeri, Dipcadi erythraeum, Allium desertorum, Urginea undulata.

Ephedra alata is a peculiar gymnosperm, quite different from Ephedra alte (= E. aphylla Forssk.).


Mesembryanthemum forsskaolii


Matthiola livida


Neurada procumbens


Arnebia tinctoria


Centaurea pallescens


Filago spathulata


Plantago


Pancratium sickenbergeri


Dipcadi erythraeum


Allium desertorum


Urginea undulata


Ephedra alata


Ephedra alte

Flora of Wadi Hof:

It is one of the big Wadis of the ED of Egypt located in Helwan Area to the south of Cairo.

It runs westwards to debouch its water into the Nile River.

The landform of it is of the “erosion pavemnent.”

It has arid climate with light amount of rainfall (30 mm).

Common Wadi Hof Plants:

Wadi Qena (greatest Wadi in the ED with length about 300 km):

It is the most notable feature of the inland part of the ED.

It runs north-south to debouch into the Nile near the Qena City.

It is running parallels to the Nile Valley, though its water flows in the opposite direction.

Ecologically, it is divided into two parts, the deltaic plain and the main channel.

The deltaic plain or the downstream section of the Wadi is characterized by vegetation comprising: Zilla spinosa, Hammada elegans, Francoeuria crispa, Artemisia judaica, cleome droserifolia, Aerva javonica, Acacia ehrenbergiana, ……etc .

The downstream section of Wadi Qena is characterized by extensive hillocks of a relic growth of old Tamarix plants.


Zilla spinosa


Hammada elegans


Francoeuria crispa


Artemisia judaica


cleome droserifolia


Aerva javonica


Acacia ehrenbergiana

Wadi Allaqi: is one of the most extensive drainage systems in the Nubian section of the ED south of Aswan.

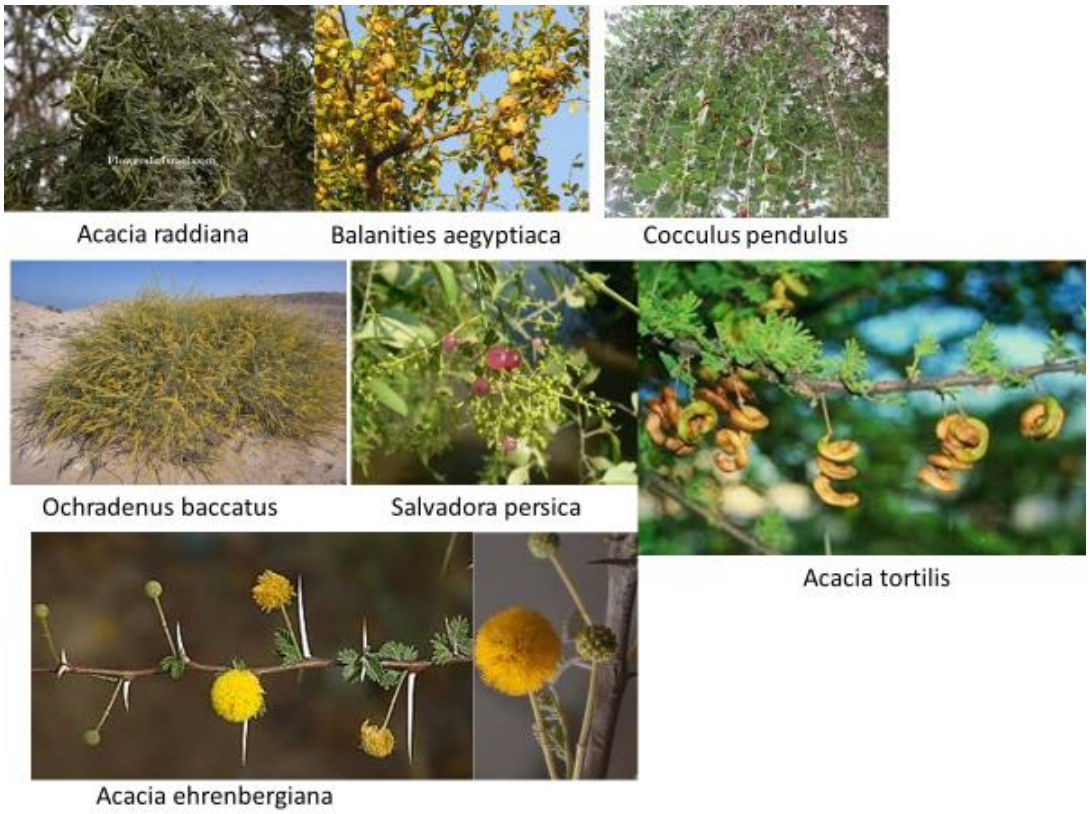
It is ecologically, divided into four main Sections:

A mountainous east (upstream) section, A middle hilly section,

A low plateau section and A deltaic section.

The mountainous (upstream) section of Wadi Allaqi forms the natural divide between the inland and coastal parts of the ED.

The Vegetation of this part may be described by a desert-forest with trees of Acacia raddiana, Balanities aegyptiaca, Cocculus pendulus, Ochradenus baccatus, Salvadora persica, Acacia tortilis and Acacia ehrenbergiana which widely distributed in this upstream part of Wadi Allaqi.



The vegetation of the middle section of Wadi Allaqi is open scrubland of Acacia ehrenbergiana, Acacia raddiana, Salsola baryoma, Fagonia indica, Indigofera argentea, Morettia philaena, Cassia senna, Aerva javonica, Aristida plumosa …..etc.

In this section, There are several fossil hillocks with dead remains of Tamarix aphylla and Salvadora persica.

In the low plateau section of Wadi Allaqi there is an open scrubland of Acacia ehrenbergiana with individuals of Acacia raddiana.

Fossil hillocks of Tamarix aphylla are present, where Salvadora persica is absent.

Also In the low plateau section, there are patches of green cover dominated by Salsola baryosma with: Cassia senna, Citrullus colocynthis, Trianthema crystallina, Fracoeuria crisa, Cistache tictoria (parasite on Salsola terandra), Convolvulus prostratus, Fagonia indica, Morettia philaea, ……etc.

A wide deltaic plain covered with a matrix of gravel and sand.

In this section, no Acacia sp. plants are recognized.

Indivduals of Hyoscyamus muticus, Aerva javonica, Crotalaria aegyptiaca, Citrullus colocynthis, Echinochlon colonum, Trigonella hamosa, Beta vulgaris, sonchus oleraceaus, Imperata cylinderica, …….etc.

FLORA OF EGYPT

The Sinai Peninsula (SP)

-The Sinai Peninsula is a triangular plateau occupying the north – eastern corner of Egypt .

The area of the Sinai Peninsula (61,000 km2) is about 6% of the total area of Egypt and represents its Asian part.

SP has 3 coastal areas :

1- in the north, the eastern section of the Mediterranean coastal land of Egypt that extends from Port Said to Rafah (240 km).

2 -In the west, the eastern coast of the Gulf of Suez that extends from el-Shatt (facing Suez) to Ras Muhammed for about 400 km.

3 -In the east, the western coast of the Gulf of Aqaba that extends from Aqaba to Ras Muhammed for about 235 km.

Sinai is characterized by high mountains in its southern section, the most important ones are:

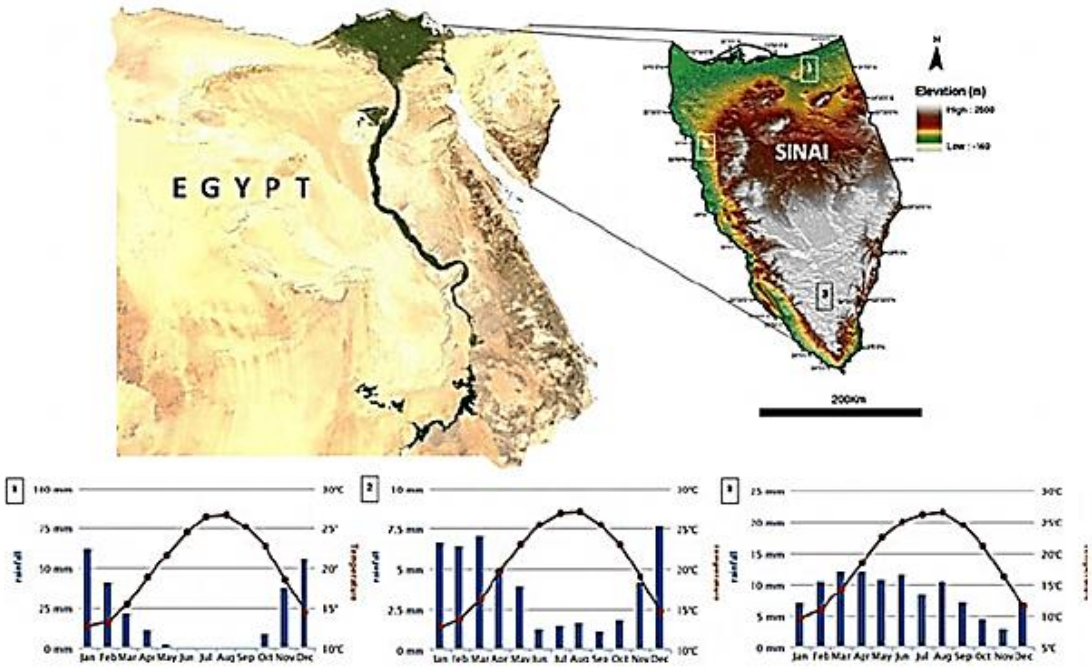
Gebel Saint Katherin (2641 m), Gebel Musa (2285 m), Gebel Halal (890 m), and Gebel Hammam Faraon.

Several Wadis are present in SP, some are running westward to the Gulf of Suez: e.g., Wadi Firan, Wadi Sidri, Wadi El – Tor …etc.

Also, there are Wadis run eastward to the Gulf of Aqaba.

The climate affecting Sinai is semi-arid along the Mediterranean coast, arid along the coasts of The Gulfs of Suez and Aqaba.

In the southern region, there are high Mountains orographic rains occurs and snow is also common during winter at top of these Mountains.



The flora of Egypt comprises about 2300 species belonging to 130 families. Out of these 63 are endemics in the different regions of Egypt: WD, ED, SP, and the Nile region.

In the SP there are about 1247 species belonging to 94 families as follows: 46 endemic species. 346 not endemics but are confined to the SP without being penetrated to the other regions of Egypt and 855 species are present in SP as well as in other regions of Egypt.

The total number of the flora of SP represents about 49.92% of the total number of the flora of Egypt.

Yet the endemics of Sinai make the main bulk (76.19%) of the total endemics of Egypt .

Family Labiatae comprises, relatively, the highest number of endemics (6 species, Origanum syriacum var aegyptiacum, Ballota kaiseri, Thymus decussata …..etc.).

Followed by Caryophyllaceae (5 species, e.g. Dianthus sinaicus, Silene leucophylla ……..etc.

4 species in Scrophulariaceae (e.g. Verbascum schempericum, Kickxia macilenta ….etc.).

Origanum syriacum var aegyptiacum

Ballota kaiseri

Thymus decussata

Dianthus sinaicus

Silene leucophylla

Verbascum schempericum

Kickxia macilenta

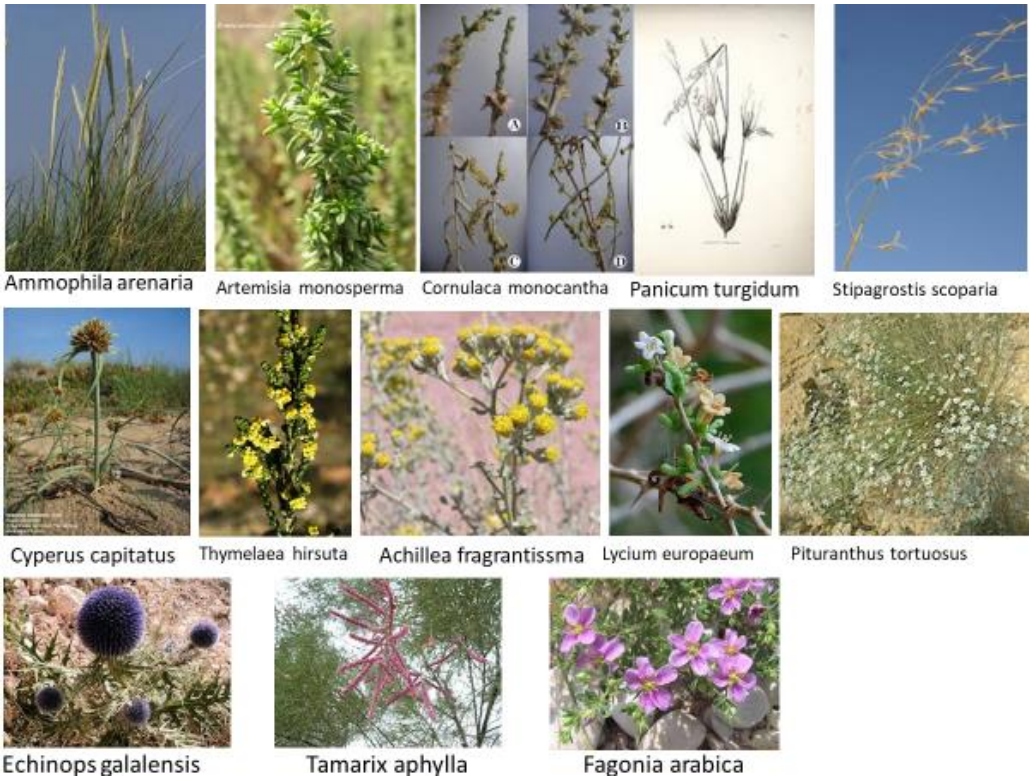
- Compositae (e.g. Phagnalon sinaicum, Scorzonera drarii …..etc.).

3 plants in Leguminosae (e.g. Vicia sinaica) and Umbelliferae (e.g. Ferula sinaica), two plants in Cruciferae, Resedaceae and Dipsacaceae, and one species belong to Ranunculaceae, Liliaceae, Juncaceae and Gramineae ……etc.

The flora of the mediterrenean coast of Sinai comprises; Halocnemum strobilaceum, Arthrocnemum glaucum, Suaeda vermiculata, Nitraria retusa, Tamarix nilotica, Limoniastrum monopetalum, Juncus rigidus, Zygophyllum album, Cressa cretica, ……etc. in the salt marshes.

The sand dunes habitat of the coastal area are characterized by the growth of: Ammophila arenaria, Artemisia monosperma, Cornulaca monocantha, Panicum turgidum, Stipagrostis scoparia, Cyperus capitatus ……...etc.

In the coastal desert grow: Thymelaea hirsuta, Achillea fragrantissma, Lycium europaeum, Pituranthus tortuosus, Echinops galalensis, Tamarix aphylla, Fagonia arabica ….etc.



-Four vegetation types have been recognized in the southern section of Sinai namely: Mangrove, Salt marsh, Desert and Mountains.

The mangrove vegetation is present in Ras Muhamed only where Avicennia marina grow.

The Salt marshes are present along the coasts of the Gulfs of Suez and Aqaba where halophytes grow e.g., Halocnemum strobilaceum, Arthrocnemum glaucum, Limonium pruinosum, Halopeplis perfoliata, Zygophyllum album, Nitraria retusa, Tamarix nilotica, Juncus rigidus, …….etc.

- The reed swamp vegetation is present in the swampy habitat where Typha domingensis and Phragmites australis grow.

- In the Wadis of the southern region of Sinai the Xerophytic vegetation comprises the following flora : Hammada elegans, Artemisia judaica, Achillea fragrantissima, Zygophyllum decumbens, Acacia raddiana, Capparis cartilaginea, Iphiona mucronata, Fagonia sinaica, Solanum nigrum, …….etc.

Hammada elegans

Artemisia judaica

Achillea fragrantissima

Zygophyllum decumbens

Acacia raddiana

Capparis cartilaginea

Solanum nigrum

Fagonia sinaica

Iphiona mucronata

The flora of the mountains of Sinai include : Juniperus phoenicea, Family Cupressaceae (plant grows only in the cold area of the world), as well as the following plants : Moringa peregrina, Ficus pseudosycomorus, Origanum syriacum, Galium sinaicum, Cratagus sinaica, Stachys aegyptiaca, Gymnocarpus decandrum, Zilla spinosa, Capparis cartilaginea, Peganum harmala, Varthemia montana, …….etc.

Cupressus semipervrens (semi-wild) is commonly present also in these mountains.

Juniperus phoenicea

Moringa peregrina

Ficus pseudosycomorus

Origanum syriacum

Galium sinaicum

Cratagus sinaica

Stachys aegyptiaca

Gymnocarpus decandrum

Zilla spinosa

Capparis cartilaginea

Peganum harmala

Varthemia montana

Cupressus semipervrens

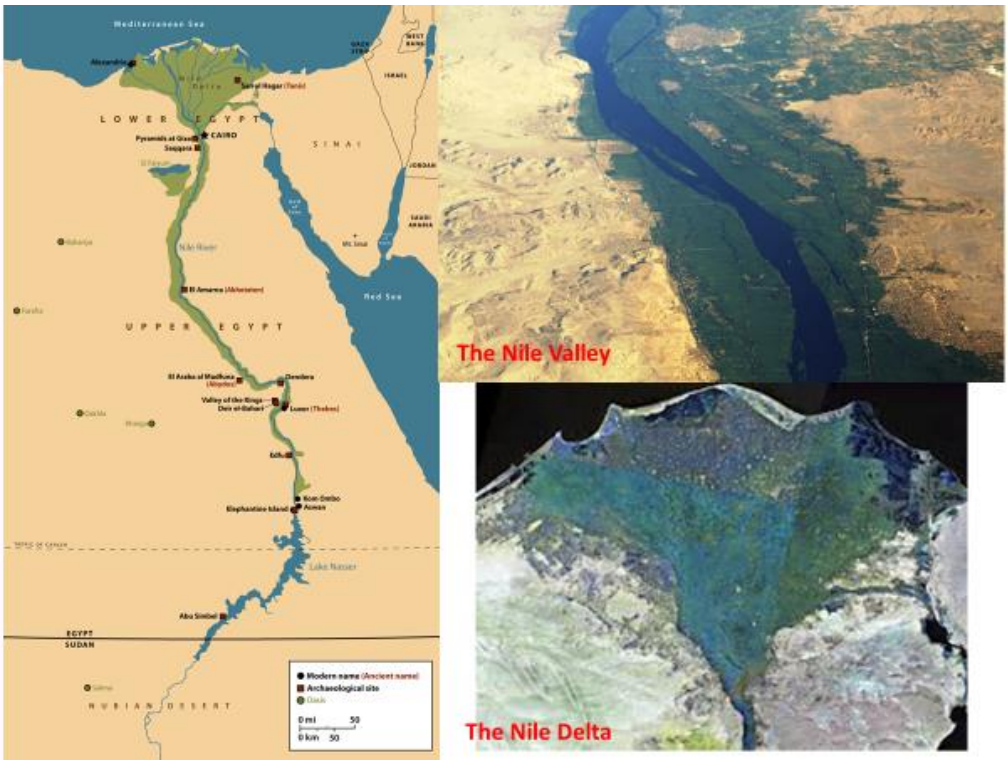
Flora of EGYPT

The Nile Region

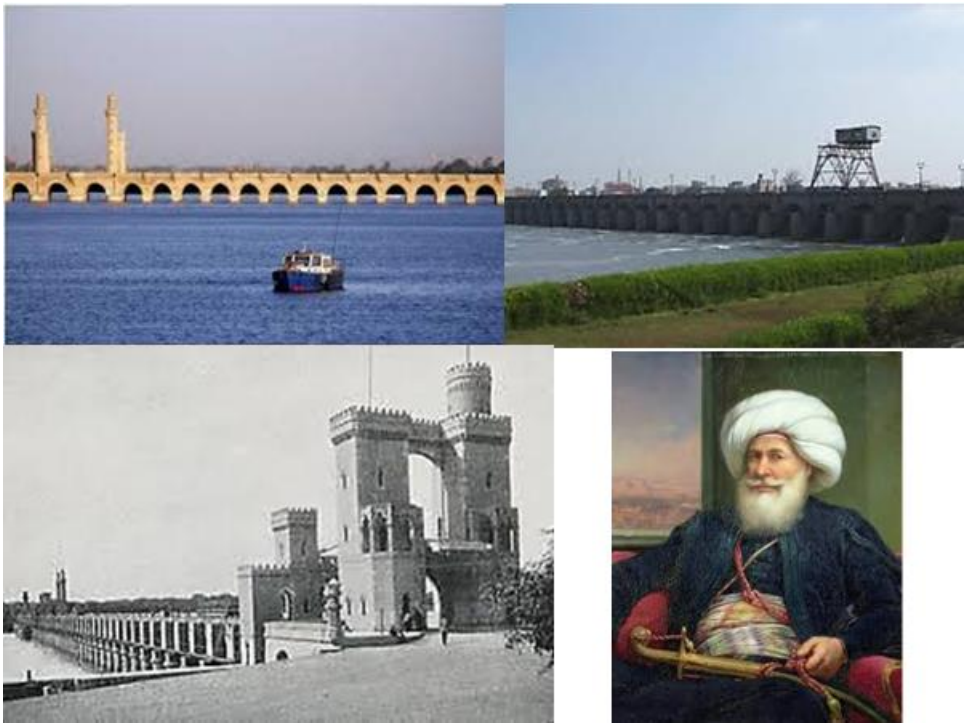
The Nile Region

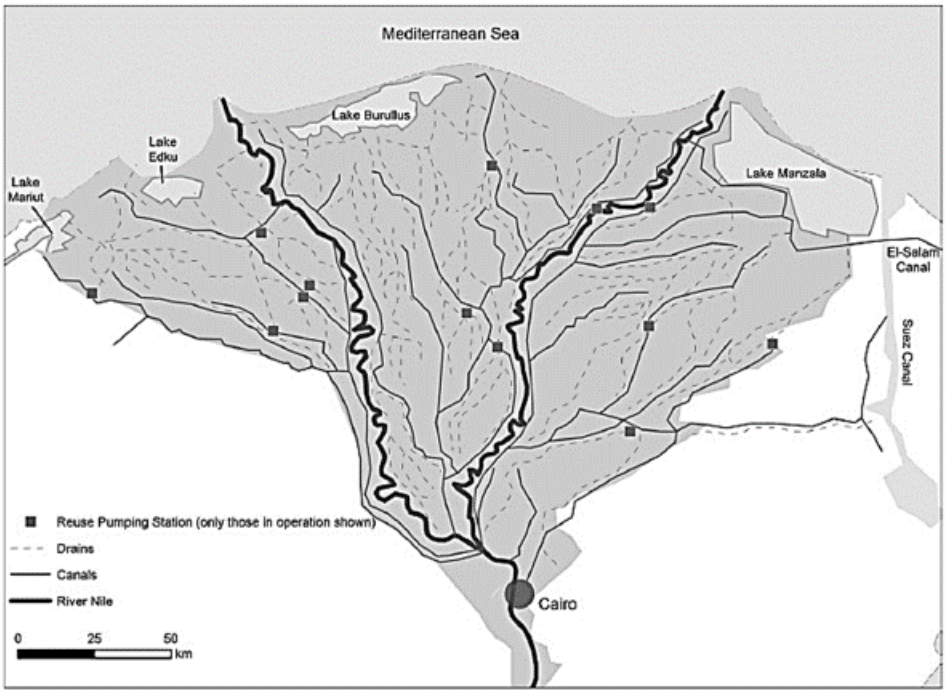
The River Nile extends from Lake Tanganyika in Tanzania (Latitude 3°S) to the shore of the Mediterranean Sea (Latitude 31° 15'N) for a length of about 6625 km. In this long course the river flows generally a south to north path, both its source in Equatorial Africa and its mouth in the Mediterranean Sea lies within one degree of the same meridian of longitude. Of the total course of the River Nile only a terminal of 1530 km lies within the borders of Egypt. It enters Egypt from the Sudan at Wadi Halfa , 350 km south of Aswan.

The Nile Valley (the Upper Egypt, Nv) extends from Wadi Halfa southwards to Cairo for about 1285 Km. and comprises the lands irrigated by the River Nile on its both banks. The Nile Delta (the Lower Egypt, Nd) appears as a triangular in shape: about 170 km in length and 220 km in breadth. Its lands are irrigated by water of the Rosetta Branch (about 239 km) and Damietta Branch (about 245 km).



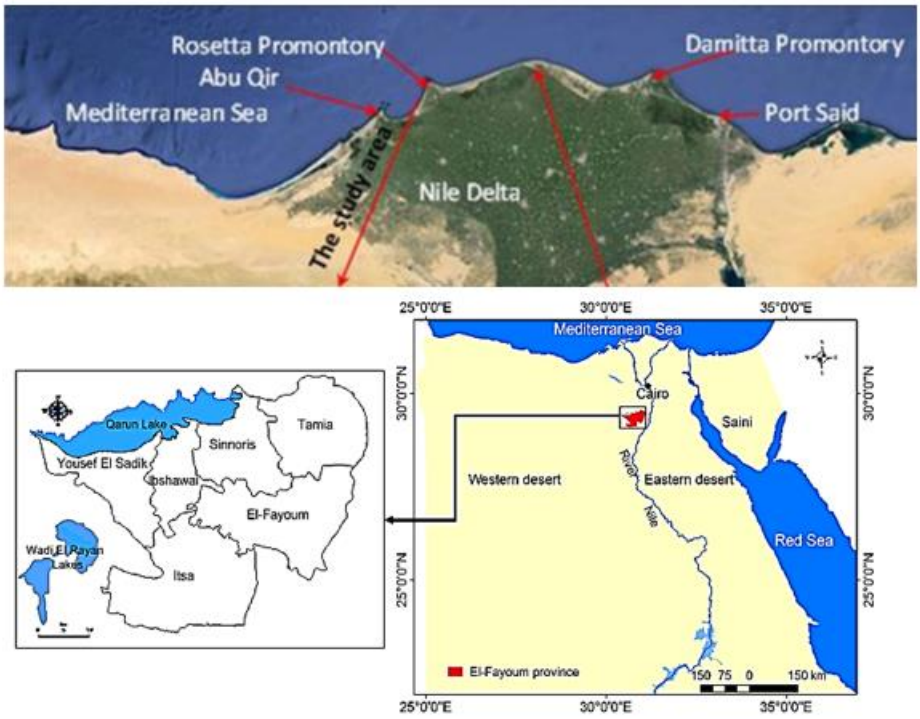
Both branches start from the Delta Barrage (Muhammed Ali Barrage), 20 km north of Cairo. The northern coast of the Nile Delta close to the Mediterranean sea is characterized by three shallow lakes : Lake Manzala (in the east) lake Burullus (in the middle) and Lake Idku (in the west) . These lakes were formed by the River Nile during the past history and are receiving the main bulk of drainage water from the Nile Delta lands.





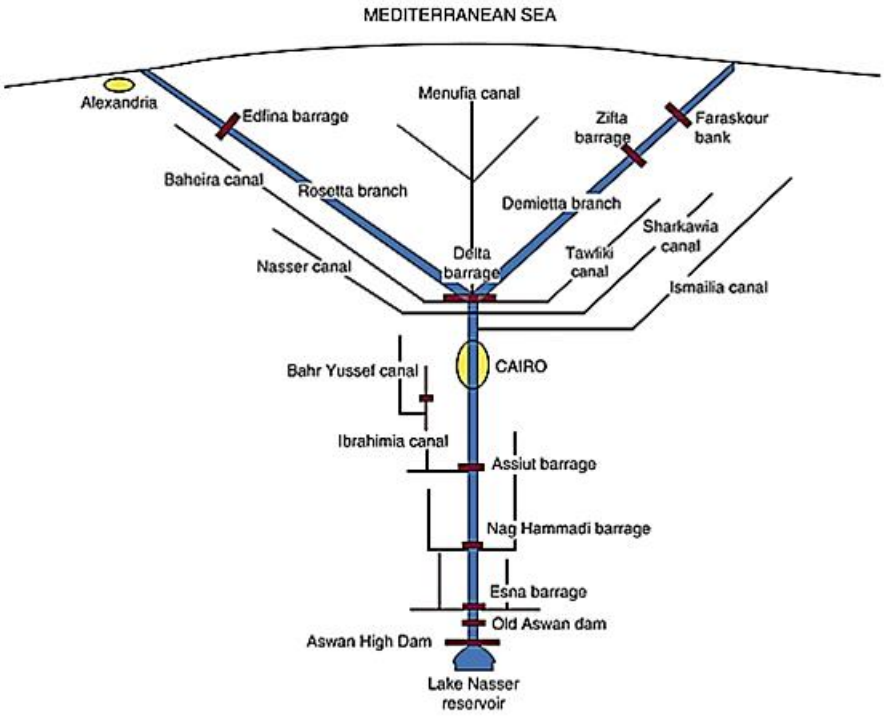
The northern coast of the Nile Region of Egypt: the deltaic Mediterranean coast extends from Abu Qir to Port Said for about 180 km. and landward in a NS direction for an average of 15 km from the Sea.

Fayium province is one of the depressions of the Western Desert of Egypt. Being the nearest to the Nile Valley and after being connected with the River Nile with Bahr Yusuf Canal , Fayium Depression is considered as a part of the Nile Region (Nf) . Its lowest part is occupied by a shallow saline lake called birket Qatrun.



Formerly all the Nile lands were watered by the inundation (or basin) system. During the past century a number of great canals were constructed to allow perennials irrigation. This scheme was completed with the construction of several barrages towards the end of the last century for raising the water level for feeding the canals. In 1902 the Aswan Dam (old Dam) was ready and the High Dam (new Dam) was ready on 1965 (El - Sadd El - Aaly) .

The cultivated strip of land around the Nile is largest at Cairo and diminishes as one proceeds south. South of Aswan it disappears completely and in most places the naked desert borders the Nile directly.



The Nile Delta starts 20 km north of Cairo, is embraced by the Rosetta and Damietta Branches. Its area is about 22,000 Km2 while the area of the Nile Valley (cultivated lands) is 12000 km2 Thus, the, delta comprises about 63% of Egypt's fertile land.

The soil of the agricultural lands of the Nile Region of Egypt is classified into: loam, clay and sand. Loamy soils are mainly composed of Nile silt and form the majority of Egyptian soils. Clay soils occur in small amounts where sandy soils are principally

found at the edges of the desert. Soil impregnated with salts is found in the Delta and Fayium. Alkaline land lies all around the lower edges of the Delta from Alexandria in the west to beyond the Suez Canal in the east and also in certain districts of Upper Egypt , where basin irrigation has been changed into perennial one . Seepages near the banks of the high level canals in another cause of increasing soil salinity. Salt affected lands are also present around the northern lakes of the Nile Delta and along the deltaic Mediterranean coastal land.

FLORISTIC COMPOSITION

The floristic elements of the Nile Region of Egypt represent about 30% of the total number of the flora of Egypt. About 130 species of these plants never recorded elsewhere in Egypt. Of the total number of these floristic elements, 149 species are present in the Nile valley, 291 species in the Nile Delta and 64 species characterize e the Nile Fayium. Therophytes represent 59. 4% of the total number followed by the Hydrophytes (9. 8%), Hemicryptophytes (9%), Chamaephytes (8. 6%), Geophytes (6.9%), Nanophanerophytes (2.9%), Parasites (2 .6 %) and Microphanerophytes (1.8%). Apart from *Opuntia ficus-indica* (L.) Mill. (family Cactaceae) which is usually cultivated as fence plant and for its edible fruit, no stem succulent are present in the Nile Region of Egypt. Also, megaphanerophytes , and epiphytes are absent The percentage of the hydropytes and helophytes (9 . 8%) is , however, the relatively higher than in the floristic elements of the other regions of Egypt.



The Nile region of Egypt comprises a number of habitats that are formed and / or greatly influenced by the water of the River Nile , These are : a) The Aquatic Habitat , b) The Swampy Habitat , c) the Canal Bank Habitat d) The Cultivated Lands e) The Northern Lakes f) The Man - Made Lakes and g) The Nile Islands The

natural vegetation of these habitats are of ecological interest , they include certain floristic elements never recorded elsewhere in the other regions of Egypt .

The coastal area of the Nile Region of Egypt is a natural extension of the Mediterranean coastal land of Egypt. The following is a report about the flora of the different habitats of the Nile Region of Egypt.

I THE DELTAIC MEDITERREAN COAST

The deltaic Mediterranean coast of Egypt (the middle section of the Mediterranean coast) extends for about 180 km from Abu Qir to Port Said with a width in a NS direction for an average of 15 km from the sea. It is dotted with cities, villages and summer resorts such as Rashid, Baltim, Gamasah, Ezbit El - Burg, Kafr El-Batikh, Ras El-Bar, Damietta, etc.

The climate of this coast is a semi-arid one with total annual rainfall = 69 - 160 mm, mean maximum temperature = 27. 9° C, mean minimum temperature = 14. 3oC, relative humidity = 60 - 74%, evaporation rate = 3.8 - 11. 1 mms / Piche.

Unlike the western and eastern sections, the middle section of the Mediterranean coast of Egypt is not only affected by the Sea water but it is also affected by the waters of the northern lakes and the Damietta and Rosetta Branches of the River Nile. The plant cover of the deltaic Mediterranean coastal land is organized into sea landward zones (habitats) that vary in domination and floristic composition which will be studied in Baltim coast as sample area of this coast.

Baltim is a summer resort belongs to Kafr El-Sheikh Governorate. Its coastal area comprises 6 successive zones (habitats): beach zone, sand sheet zone, Gebel El - Nargis zone, zone of salt marshes, zone of palm trees - sand dunes and zone of the swamps.

The beach is a narrow strip of sand with a width varies between 100 - 200 m. It is practically barren of vegetation except of some dry remains of sea weeds and marine algae. The second zone is also narrow with sandy substratum dominated by *Silene succulenta* associate with *Cakile maritima* , *Cynodon dactylon* , *Polygonum equisetiforme* , *Alhagi maurorum* , *Melilotus indica* , *Erodium hirtum* , *Cyperus*

capitatus , Acacia saligna , Paspalidium geminatum , Dactyloctenium aegyptium , Lippia nodiflora , Ricinus communis (semi-wild) , Senecto desfontainei Mesembryanthemurn crystallinum , Parapholis marginata, Launaea angustifolia , Polypogon maritimus , Emex spinosus , Amaranthus sp ., Salsola kali, Malva parviflora, Ifloga spicata, Cutandia memphitica, Lotus halophilus, Euphorbia sp . etc. *Figs (Ficus carica) and water melon (Citrullus vulgaris)* are cultivated by the natives in this zone.

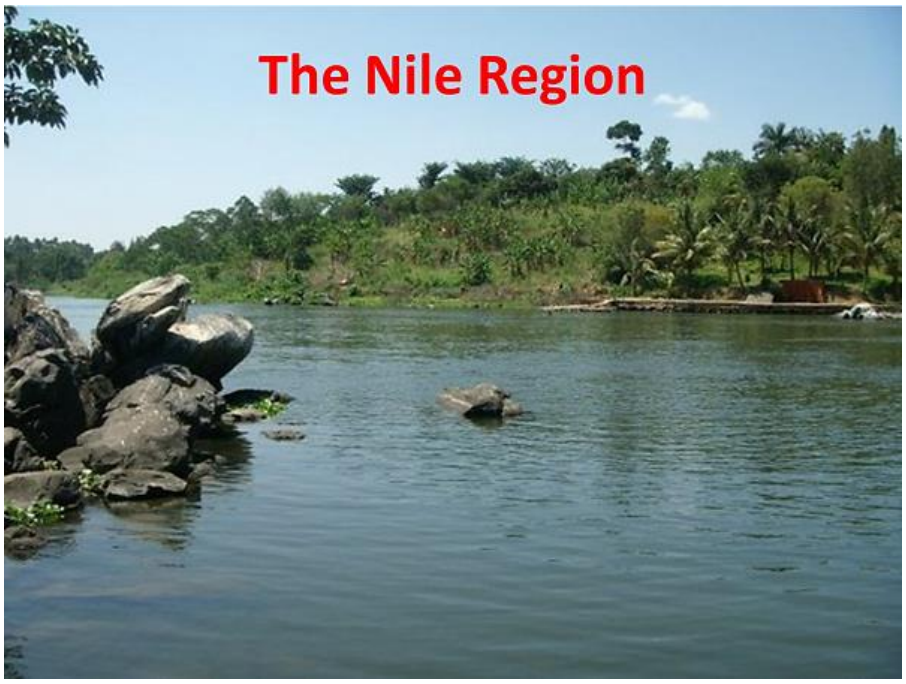
Gebel El - Nargis sand dunes occupy the third zone of Baltim coast. They have two slopes: north facing and south facing, both are dominated by *Silene succulenta* . The floristic composion of these dunes include : *Lolium rigidum , Phoenix dactylifera* (semi - wild) , *Alhagi maurorum , Melilotus indica , Erodium hirtum , Lycopersicum esculentum , Cynodon dactylon Desmostachya bipinnata , Imperata cylindrica , Polygonum equisetiforme , Ipomaea stolonifera , Pancratium arabicum , Stipagrostis ciliaris , Echinops spinosissimus , Salsola kali , Ifloga spicata , Bromus rubens , Cakile maritima, Rumex pictus , Plantago indica , Malva parviflora , Ononis serrata , Pseudorlaya pumila , Carthamus glaucus , Polypogon monspeliensis , Daucus bicolor*

Cyperus capitatus and the cultivated plants Ficus carica, Vitis vinifera and Citrullus vulgaris. The fourth zone is a salt marsh habitat dominated by *Arthrocnemum glaucum* with *Halocnemum strobilaceum* as abundant associate species. The other plants of this zone are: *Cressa cretica, Zygophyllum aegyptiurn, Frankenia revoluta, Sporobolus spicatus, Cyperus conglomeratus, Limonium pruinosum, Limoniastrum monopetalum, Cynodon dactylon, Polygonum equisetiform, Spergularia sp., Moltkiopsis ciliats, Aetheorhiza sp., Lippia nodiflora, Reichardia tingitana, Mesembryantemum crystallinum , Chenopodium sp* . etc.

The fifth zone is another zone of huge sand dunes dominated by the semi - wild palm trees *Phoenix dactylifera (zone* of palms). In the depressed areas within these dunes the underground water is exposed forming local swampy habitat where *Typha domingensis* predominates. In the saline patches of the runnels

within these dunes there are societies dominated by *Arthrocnemum glaucum, Schoenus nigricans, Sporobolus viginicus, Imperta cylindrica* and *Zygophyllum aegyptium.* The other societies of the palm dunes include: *Pancratium arabicum* (abundant), *Erodium hirtum Alhagi maurorum, Cyperus capitatus, Desnmostachya bipinnata, Rumex pictus, Ononis serrata, Pseudorlaya pumila, Launaea angustifolia, Malva parviflora , Sinapis arvensis, Adonis dentatus, Lobularia libyca, Plantago* sp. etc.

The innermost zone is a depression which receives the drainage water seeped from the cultivated lands of Baltim villages and from Lake Burullus. *Typha domingensis* is the dominant reed of these swamps associated with: *Phragmites australis.* In the saline banks of these swamps grow: *Juncus rigidus, J acutus, Cyperus conglomeratus, Cressa cretica, Suaeda pruiosa , Tamarix tetragyna , Halimione portulacoides, Inula crithmoides, Mesembryanthemum crystallinum, Frankenia revoluta, Polygonum equisetiform* etc.



II THE AQUTIC HABITAT

In Egypt, where the climate is warm during most of the year the aquatic flora (the hydrophytes) of the River Nile and its irrigation and drainage canals are

well developed . The establishment of Aswan High Dam (1965) controls to great extent the flow of water in the River Nile and its Damietta and Rosetta Branches which resulted in a better penetration of light (due to the great reduction in silt) and reduction in rate of water flow.

Such new conditions enhance the growth of the hydrophytes of both types: submerged and floating. Even, new water weeds e. g. *Myriophyllum spicatum* started to appear.

The aquatic plants of the Nile System of Egypt comprise 35 species belonging to 19 genera and 15 families as follows.

1. Family Araceae

Pistia stratiotes: Free floating weed present only in the calm and stagnant water canals of Faraskur (20 km south of Damitta) absence elsewhere in Egypt

2. Family Ceratophyllaceae

Ceratophyllum demersum is very common and dangerous submerged weed. *C. submersum* and *C. muricatum* are rare in Egypt.

3. Family Haloragidadceae

Myriophyllum spicatum has been recently recorded invading the River Nile System, never seen before the establishent of Aswan high Dam. It is a submerged weed.

4. Family Hydrocharitaceae

To this family belongs three submerged plants, namely: *Ottelia alismoides, Elodea canadensis and Vallisneria spiralis .*

5. Family Lemnaceae

This family comprises a group of very small floating water plants without distinct stem and leaves but with tiny leaf -like fronds forming green masses on the surface of stagnant waters. In the Nile system there are 6 species belonging to 3 genera namely: *Spirodela punctata , S . polyrrhiza. Lemna gibba, L .minor, L. perpusilla* and *Wollfia hyalina.*

6. Family Lentibulariaceae

Utricularia inflexa floating plant with finely dissected leaves carrying bladders in which small animals are caught (insectivorous water weed) It usually grows in the rice fields of the Nile Delta.

7. Family Marseliaceae

Marselia aegyptiaca is an aquatic fern common in all waters of the Nile System of Egypt. *Marselia capensis* is rare and present only in the Nile Delta.

8. Family Najadaceae

Najas spp. is submerged water plants. *N. pectinatus*, N. minor and *N.graminea* are very rare in the Nile Delta, absent from other parts of the Nile System. *N. armata* is common in the Nile delta and Fayium

9. Family Nymphaeaceae

Nymphaea coerulea (blue water Lily) and N. louts (White water Lily) are the sacred water lilies of the ancient Egyptians. They are floating plants common in the Nile Delta, rare or absent in the Nile valley.

10. Family Onangaraceae

Jussiaea repens very rare free floating weed.

11. Family Pontederiaceae

The genus *Eichhornia* includes free floating plants that occur in Egypt in two species: *E. crassipes* and *E. azurea.* The second is very rare and grows (cultivated) in the gardens of Cairo, it causes no trouble. *Crassipes*, on the other hand, is the most dangerous water weed in Egypt (water Hyacinth or Ward El - Nil).

12. Family Potamogetonaceae

Potamogeton spp. are submerged weeds and include :

(i) *P. crispus* very common.

(ii) *P. pictinatus* very common

(iii) *P. nodosus* common

(iv) *P. peifoliatus* rare (in Nile Nubia only) All *Potamogeton* spp. are dangerous hydophytes.

13. Family Ranunculaceae

Ranunculus saniculifolius, R.rionii R,trichophyllus **and** *R. sphaerospermus* is rare in the Nile Delta absent from Upper Egypt.

14. Family Ruppiaceae

Ruppia maritima var. *spiralis, R.maritima* var. *rostrata* **are** submerged hydrophytes.

15. Family Zannichelliaceae

Zannichellia Palustris is very common water weed in all water bodies of Nubia and Lake Nasser.

III THE SWAMPY HABITAT

The weeds of the swampy habitat are immersed plants with roots, rhizomes and lower parts of their aerial shoots are under water. These include *Phragnzites australis* the most serious and very common reed in Egypt. It belongs to grass family Gramineae. *Typha domingensis (Typhaceae*) is another dangerous reed very common in Egypt.

The other swampy plants comprise the following: *Echinochloa staginum, E.crusgalli, Paspalidium geminatum, Polypogon monspeliensis, Diplacahne fusca* etc. (Gramineae), *Polygonum salicifolium, P. senegalensis, (Polygonaceae), Veronica anagallis - aquatica* (Schrophulariaceae), *Cyperus articulates C. longus, C. difformis, Scirpus litoralis,* (Cyperaceae) *Juncus subulatus* (Juncaceae) etc. *Cyprus papyrus* was very common is the Nile Delta swamps during ancient time. Its culms were used is making papers. Nowadays it is eliminated from the swampy habitats of Egypt. Few individuals are growing in Chaman Garden of Cairo.

IV CANAL BANK HABITAT

These include cultivated and naturally growing trees, shrubs, under shrubs and herbs .

The important species are:

a) Cultivated plants .

Ficus sycomors, Morus alba , M. nigra , Acacia nilotica , Melia azederach , Parkensonia aculeata , Salix safsaf , S. babylionica , Zizyphus spina - cristi , Casuarina equisetifolia , Dalbergia sisso , Eucalyptus rostrata , E. citriodora , Ricinus communis , Opuntia ficus - indica etc .

b) Wild Plants

Tamarix arborea, Conyza dioscoridis, Desmostachya bipinnata, Imperata cylindrica, Inula crithmoides, Suaeda vermiculata. Arthrocnemum glaucum, Arundo donax, Alhagi maurorum, Dichanthium annulatum, Panicum maximum, Kochia. indica , Mentha

silvestris, Lippia nodiflora, Silybum marianum, Sphaeranthus suaveolens, Canna indica, Saccharum spontaneum, Cyperus laevigatus, Trifolium resupinatum, Nitraria retusa, Ambrosia maritima, Andropogon annularis, Urospermum picroides, Halimione portulacoides , Glinus lotoides , Ethulia conyzoides , Verbena supina etc.

V. WEEDS OF THE CULTIVATED LANDS

Weed flora of the cultivated lands of Egypt are mainly ephemeral, and annual herbs. Perennial herbs, under shrubs and shrubs may also be present. These weeds are associated with the summer and winter crops. Weeds of common occurrence in winter crops are : *Melilotus indicus, Cynodon dactylon, Sonchus oleraaceus, Chenopodium murale, Trifolium resupinatum, Anagallis arvensis, Chenopodium album, Brassica nigra, Polypogon monspeliensis, Vicia calcarata, Malva parviflora, Emex spinosus, Solanum nigrum, Polygonum equisetiforme, Xanthium brasillicum, Urochloa reptans, Cichorium pumilum, Dactyloctenium aegypticum, Eragrostis pilosa* etc .

The weeds of summer crops include. *Echinochloa colonum , Cynodon dactylon, Portulaca oleracea , Convolvulus arvensis , Cyperus rotundus , Sonchus , oleraceus , Solanum nigrum , Xanthium spinosum , Silene rubelaa , Amaranthus chlorostachys , Beta vulgaris , Rumex dentatus , Ammi majus , Euphorbia peplus , P lantago lagopus , Lotus corniculatus and Reichardia orientalis*

VI. THE NOTHERN LAKES

The northern lakes of the Nile Delta namely: Lake Manzala , Lake Burullus and Lake Idku are located very close to the Mediterranean Sea . They are separated from it by strip of land that are very narrow in several places and in the same time are connected with the sea through outlets (straits).

Lake Manzala is the largest (= 300,000 feddans). It lies between the Mediterranean Sea to the north, the Suez Canal to the east, the damietta Branch and the povinces of Sharkiya and Dakahlya to the west. Thus, Lake Manzala serves 5 provinces of Egypt namely: Ismaillia, Port Said, Damietta, Sharkiya and Dakhaliya. It is shallow lake with depth not exceed one meter. It is characted by a large number of Islands (about 1022).

The plant life of Lake Manzala comprises halophytic elements that grow mainly on the shores of the islands. These include 26 species belonging to all families as follows : *Artrocnemum glaucum, Atriplex fahnosa , Halimione portulacoides , Halocnemum strobilaceum , Halopeplis perfoliata , Salicornia fruticosa , S.herbaces , Salsola kali , S.longifolia, Suaeda pruinosa , S.salsa S.vermiculata and S.vera (chenopodiaceae), Arundo donax, Phragmites australis and Sporobolus spicatus (* gramieae) , *Cressa cretica (convolvulaceae) Cistanche Phelypaea (* orobanchaceae) *Cyperus Laevigatus (* Cyperaceae) , *Inula crithmoides (* compositae) , *Juncus rigidus (* Juncaceae) , *Tamarix aphylla (tamaricaceae*), *Typha domingensis (Typhaceae) and Zygophyllum album (* Zygophyllaceae) .

Fresh water hydrophytes namely: *Eichhornia crassipes. Potamogeton crispus, P.petinatus , Lemna spp., Ceratophyllum demersum* are present in the water of the lake .

VII MAN MADE LAKE

The construction of Aswan High Dam in the most southern part of Egypt resulted in the formation of a huge man-made lake : High Dam, Lake : mean depth - 24.8 m, mean width = 18 Km .

The shore - line vegetation comprises the following floristic elements *: Tamarix nilotica , Hyoscyamus muticus , Phragmites australis , Salsola baryosma , Francoeuria crispa , Citrullus colocyunthis , Fagonia arabica , Glinus lotoides , Heliotropium supinum , Rumex dentatus, Echium raumolfii , Portulaca oleracea , Pulicaria undulata , Senecio aegyptus , Calotropis procera , Morettia philaena* etc . The shallow waters along the shore line is the habitat of some water plants e.g *Potamogeton trichoides , Najas minor ,N.armata, Portamogeton •nodusus,Zanichellia palustris , Ceratophyllum demersum* etc .

VIII THE NILE ISLANDS

The Nile at Aswan north of the High Dam is interrupted by abotut 30 uninhabited granite islands e.g. Duns islans , Burbur Island, Gezel Island etc . The submerged land of these islands is usually occupied by aquatic flora e.g *Ceratophylum demersum* and *Potamogeton crispis* . In the partly submerged land *Phragmites australis, Polygonum senegalensis , Panicum repens* and *Cyperus* spp . *Typha domingensis , Veronica anagallis-*

aquatic etc grow . The meadow-grass habitat of this island is co-dominated by *Cyperus longus* and panicum repens . The floristion composition : *Cyperus mundtii, Cynodon dactylon , Sesbania sesban , Lotus arabicus , Cyperus rotundus , Tamara- nilotica, Trigonella hamosa, Mimosa Pigra, Salix subserrata, Cajanus Cajan , Saccharum spontaneum , Senecio aegyptus , Gnaphalium luteo-album, Sonchus oleraceus , Plantago major , Trigonella , hamosa , Leptadenia pyrotechinca, Francoeuria crispa* etc.

PLANTS OF GARDENS AND STREET TREES

- *Duranta plumieri (*Verbenaceae)
- *Clerodendron inerme (*Verbenaceae)
- *Lantana camara (*Verbenaceae)
-. *Bougainvillea glabra (* Nyctaginaceae *)*
  —- *Schinus terebinthifolius (* Anacardiaceae *)*
  —- *Rosa involucrata (Rosaceae)*
- *Myoporum acuminatum (Myoporaceae)*
  –Ipomoea palmata (Convolvulaceae)
  –sit el-Husn and Ipomoea tricolor.
  *–Jasminum gradiflorum (*0leaceae*), J. sambac and J .primulinum Known "Foll ".*
- *Hibiscus rosa-sinensis (*Malvaceae*)*
- *Lawsonia inermis (*Lythraceae*).*
  –Callistemon lanceolatus (Myrtaceae)
  – Nerium oleander (Apocynaceae)
  – - Plumbago capensis (Plumbaginaceae)
  – Plumeria acutifolia (Apocynaceae) Jasmin Hindy
  – Plumeria acutifolia (Bignoniaceae)
  – -▪ Vitex agnus castus (Verbenaceae) Kaff Mariam
  –Datura arborea (Solanaceae)
- *Euphorbia pukherrima (Euphorbiaceae) Bint El-Onsul*

– *Myrtus communis (Myrtaceae)*

– *Opuntia ficus-indica (Cactaceae)*

–*Aloe vera (Liliaceae)*

–*Agave americana (Agavaceae)*

–- *Amaryllis vittata (Amaryllidaceae)*

–*Anemone coronaria (Ranunculaceae)*

- *Canna indica (Cannaceae)*
- *Dahlia variabilis (Compositae)*
- *Gladiolus gandavensis (Iridaceae)*
- *Iris xiphium (Iridaceae)*
- *Narcissus tazetta (Amaryllidaceae)*
- *Ranunculus asiaticus (Ranuculaceae)*
- *Oxalis cernua (Oxalidaceae)*
- *Albizzia lebbekh (Leguminosae , Dakn elBasha)*
- *Acacia fornesiana (Leguminosae)*
- *Cassia artemisioides (Leguminosae)*
- *Cassia disymobtrya (Leguminosae)*
- *Hemerocallis flova (Liliaceae)*

– *Pelargonium graveolens (Geraniaceae) Etr*

– *- Viola odorata (Violaceae) -Beneffig*

– *- Centaurea moschata (Compositae , Anber Baladi)*

- *Cheiranthus cheiri (Cruciferae , Mantour Asfar)*

– *Lathyrus odoratus (Leguminosae - Bissila Zohour)*

– *- Matthiola incana (Cruciferae , Mantour)*

– *- Thuja orientalis (Coniferae)*

Vinca rosa (Verbenaceae, Al-Wenka)

- *Adiantum capillus-veneris (Fern, Adiantaceae)*
- *Thevetia peruviana (Apocynaceae)*

Important Egyptian Crops and Vegetables

A. Cereals (Gramineae)

Hordeum vulgare
Oryza sativa
Saccharwm officinarum
Sorghum durra
Triticum vulgare
T. durum
T. pryramidale
Zea mays

B. Crops of Leguminosae

Arachis hypogaea

Cicer arietinum

Dolichos lablab

Lathyrus sativus

Lens esculenta

Lupinus termis

Medicago sativa

Phaseolus vulgaris

Pisum sativum

Trifolium alexandrinum

Trigonella foenum – graecum

Faba vulgaris (Vicia faba)

Vigna sienensis

c. Vegetables of Liliaceae

Allium cepa

A. kurrat

A. porrum

A. sativum

D. Vegetables of Cucurbitaceae

Citrullus vulgaris البطيخ
Cucurbita pepo القرع
Cucumis melo الشمام
Cucumis sativus الخيار

Citrullus vulgaris v. colocynthoides

E. *Vegetables of Umbelliferae*
Anethum graveolens
Apium graveolens

Carum carvi
Carum carvi
Coriandrum sativum
Cuminum sativum
Petroselinum sativum
Pimpeniella anisum

F. Species of Labiatae
Origanum majorana مردقوش زعتر

Mentha sativa النعناع

Rosmarinus officinalis حصا اللبان

Ocimum basilicum الريحان

G. Species of Pedaliaceae

Sesamum indicum /لسمسم

H. Root crops

Beta vulgaris (chenopodiaceae) البنجر

Brassica rapa (Cruciferae) الفجل

Colocasia antiquorum (Araceae) القلقاس

Cyperus esculentus (Cyperaceae) السعد اللذيذ
Daucus boissieri (Umbelliferae) الجذر

Species
Helianthus tuberosus (Compositae)
Raphanus sativus v.aegyptiacus (Cruciferae) الفجل الابيض
Solanum tuberosum (Solanaceae) البطاطس

F. Fruits Used As Vegetables

Capsicum annuum (Solanaceae) فلفل احمر
C. frutescens (Solanaceae) الشطة
Solanum Lycopersicum (Solanaceae) الطماطم
S. menlongena (Solanaceae) الباذنجان
Hibiscus esuculentus (Malvaceae) الباميا

1. Inflorescence as Vegetables

Cynara scolymus (Compositae) الخرشوف
Brassica oleraceae v.botrytis (Cruciferae) القرنبيط

J. Shoots As Vegetables

Asparagus officinalis (Liliaceae)

K. Leaves As Vegetables

Spinacia oleraceae (Chenopodiceae)
Beta vulgaris v. Cicla (Chenopodiaceae)
Portulaca oleraceae (Portulacaceae)
Malva parviflora (Malvaceae)
Corchorus olitorius (Tiliaceae)
Brassica oleraceae V. capitata (Crucifere)
Cichorium endivia (compositae)
Lactuca sativa (compositae)
Eruca Sativa (Cruciferae)

L. Oil , Textile and dye Plants

Agave americana (Amaryllidaceae)
Carthamus tinctorius (Compositae)
Gossypium barbadense (Malvaceae)
Lawsonia inermis (Lytheraceae)
Olea europaea (Oleaceae)
Ricinus communis (Euphorbiaceae)
Linum usitatissimum (Linaceae)

NOTES ON SOME CROPS AND VEGETABLES

The Egyptian Cazzar BaladiDaucus *Boissieri* is only found in Egypt , not in other countries , Also , the Egyptian *Allium kurrat* is cultivated mainly in Egypt and to very small extent in Palestine and Pharaonic times .

The most common used " Libb Asmar " , the brown - small one is obtained from *Citrullus vulgaris v. colocynthoides* . It is a small bitter water - melon , some what larger than Handal (*Citrullus colocynthis)* and it is grown on a small scale in Upper Egypte . The main bulk of it , however , is imported from Sudan .

The white figl represents a variety only found in Egypt , *Raphanus sativus v.agyptiacus* . It is unknown outside Egypt.

All the numerous cucmbers and melons grown in Egypt are also unknown outside the country. Most of them are of very ancient cultivation and have been cultivated since pharaonic times. e. g Clay moddels of Faqqos over 4000 years olds are Kept in Agricultural Museum of Cairo . Also , the typical pointed Abdelllawi melons are depicted in a tomb at Saqqara from old Empire : 4500 Years ago .

Karafs , *Apium graveolens* was the emblem of sorrow in Ancient Egypt . It was used in funeral garlands to decorate the mummies. It was also planted on tombs.

Flax, *Linum usitatissimum* , was the most important textile plant in Ancient Egypt . All mummy wrappings are made out of lines (flax fiber) . Cotton of late introduction.

The oldest cotton fabrics in Egypt were discovered lately by Prof. Greiss. He found cotton thread in some embroideries from the Monastery of Phoebammon West of Luxor, dating from the 4th century A.D.

Among the oldest Known food staff in Egypt is Habb El - Aziz, *Cyperus esculentus* , which has been found in the intestines of the prehistoric mummies . Also, husks of barley and libb was found in the mummies

Onions have always been connected with superstition not only in Egypt, but all over the civilized world. It was the custom in Ancient Egypt to place one or more onions inside the cavity of the body at the embalming of the dead. Ramses II has an onion in the left armpit and Ramses **II** had anions placed as a sort of artificial eyes. The onion has as ascribed protective properties. The custom among the fellahin of today to suspend a bundle of onions above the doors as a protection certainly originated from ancient traditions.

Henna. *Lawsonia inermis,* has been found in mummy garlands. It has been cultivated since the most ancient times. The same with Qortorn: *Carthamus tinctorius.*

Khass , *Lactuca sativa* , was the symbol of fertility in Ancient Egypt and the God of fertility , is often depicted with a khass in his hand always representing the same variety with very long leaves that is still cultivated in Egypt .

Hordeum and *Triticum* have been cultivated in Egypt suince prehistoric times , of *Hordeum* the same species as tody , *H. vulgare* . of *Triticum* other species , *T. dicoccum* , which is no more grown in the country .

Dura Shami , *Zea mays* , comes from America , Egypt got it shortly after the Turkish conquest in 1517 . Dura Fealadi Dura rafia , *Sorghum durra* , probably comes from Central Africa . It was not known during Pharaonic time .

Orz , Ruzz , *Oryza sativa* , is late . It was introduced during the time of Caliphs .

Qassab el - Sukkar , *Saccharum officinarum* , has been cultivated in India since remote trimes and became known to the Europeans during the expedition of Alexander , 127 **B . C .** It was introduced to Egypt during the Caliphate of Omar , 634 - 644 A . D .

Corchorus olitorius , Melokhia , is a native of India although widely naturalized in the tropices and also in Egypt . In other countries it is grown mainly for its fibre " Jute " .

Mustared , Khardal is obtained from two plants of Cruciferae *Sinapis alba* , the seeds of which yield white mustard , and *Brassica nigra* , the source of the blak mustard , The latter is called in Arabic *kaber* and often occurs as a weed in the fields . Its yellow flowers are sold by the florists as a cut - flower for their sweet smell.

A very peculiar plant is *Arachis hypogaea,* Peanut or Fool Sudani . Its Yellow papilionaceous flowers are almost sessil. After flowering the pedicel elongates and carries the young fruits beneath the ground.

Where it matures into the reticulated indehiscent pod. Hence its name hypogaea (meaning subterranean or underground).

N . B .

sativus = Cultivated

esculentus = edible

vulgaris = common

Officinalis = of medicinal use

Oleraceus = vegetable garden herb used in Cooking

tuberosus = tuberous

tinctorius = of dyes

annuus = annual

Olitorius = belonging to vegetable gardens or gardeners

PHARAONIC PLANTS

Egypt is the only country in the world where we have remains of ancient " tomb plants " . At the excavations of archaeological sites , one frequently finds fruits or vegetables or ornamental flowers placed with the mummy to serve him as food or pleasure in the hereafter . Due to the dry and hot climate these plants have remained intact even after an elapse of 5,000 years or more . If they are soaked in hot water , they get soft and could be examined morphologicaly and anatomically like any recent material . Such plants are of utmost importance for tracing the history of our

present crops and vegetables . They give witnnes about Egypt's connections in olden days with various countries and they throw light upon the most different fields of Egyptian culture .

In the beginning , Egyptologists paid but little attention to the ancient plant remains . They were thrown away as rubbish , But in the beginning of last century , J. Passalacqua got the idea of making a little collection of about 20 tomb plants which he submittted to Prof. Kunth in Germany for detrmination (1926) . Kunth's publication about them arose a great interest , and soon other botanists involved themselves in this field . Mention may be made of Prof . F. Unger in Vienna , who got the bright idea of dissolving ancient mud brickls from accurately dated monuments in water and collect the embedded plant remains. He worked on bricks from Lahum at Fayum etc . and succeeded to identify quite a number of different plants .

The most important of all ressearches on pharaonic plants was made towards the end of last centucy by Prof , Georg Schweinfurth . Because of his thorough knowledge of the modern Egyptian flora he succeeded in identifying plants where anybody else would have failed. Often a leaf or a stem fragment or a single seed was all material at his disposal, and yet he succeeded to name it . He listed about 250 different species, and in addition prepared a " Pharaonic herbraium " , unique in its kinds , where every plant fixed on the sheets is about 3 - 4 , 000 years old . This herbarium is at present exhibited in the Agricultural Museumof Cario and constitutes one of the most precious things kept in that museum.

The following are some plants commonly used in different purposes by the ancient Egyptians during the prehistoric (Pharaonic) periods .

- *Nyinphaea* lotus and *N.coerula ,* Nymphalaceae , the sacred flowers (water Lilies) .

– *Hordeum vulgare , Triticum dicoccum , Panicum* spp . etc ., (gramineae) , cereals .

- Palms : *Phoenix dactylifera (* data) , *Hyphaene thebaica (* dom) and *Medemia argun (* argune) , palmae

– Gemmeiz : *Ficus syconiore ,* moraceae .

The sycomore was the tree of love God , Hathor . The young people were used to meet under a sycomore tree to receive the blessings of Hathor to their love .

– Oil was obtained from the seeds of e.g *Olea europaea , (oleaceae) •Linum usitatissimum , (Linaceae) , Ricinus communis , Euphorbiaceae , Carthamus tincatorius and Lactuca sativa , (compositae)* .

- Drugs were obtained from : *Papaver somniferum (papaveraceae) , Hyosyamus muticus (* Sakaran) , Solanceae) , *Cassia fistula , (* legutninosae) , *Calotropis procera (* Asclepiadaceae) , Citrullus colocynthis (cucurbitaceae) .*Anastatica hierockuntica (cruciferae)* .

– Linen was made from the flex : *Linum usitatissimum*

- Mummy backets were made from *Ceruana pratensis (* compositae) - Wine was made from *Vitis vinifera (vitaceae*) .

- Leguminous foods were including: *Lens esculenta , Lupinus termis , Lathyrus sativus , Vicia faba , Cicer arietinum* .

- *Allium* spp . (*A.cepa , **A.kurrat** A.sativum) (* cruciferae) , were popular foods .

– Papyrus (Burdy) , *Cyperus papyrus* was one of the most famous plants in ancient Egypt . It was sacred plant and the symbol of Lower Egypt . It was used for making boats , baskets etc . but its main use was for manufacturing paper .

- *juncus rigidus , J. acutus* etc . , family juncaceae, were used in making baskets , pens , sandals etc .

- *Cyperus esculentus ,* Habb el aziz , is the oldest known food stuff in Egypt . It has been found in the intestines of prehistoric mummies.

DRUG PLANTS

Since ancient days Egypt has been famous for its pharmacognosy. There has been found several papyrus documents dealing with drugs, and Egypt has two gods of Medical Science. One was Amenhotpe, son of Hapu and the otherImhotep. The most famous was the latter. He was originally prime minister to Pharaoh Zoser, physician, architect, and builder of the Step

Pyramid at Saqqara, which dates from the 3rd Dynasty, c.3000 B.C. He was later declared the God of Medical Science and as such was adopted also by the Greeks who called him "Aesculapios".

During the Greek period, c.2000 years ago, there were many famous herbalists dealing with the drug plants of Egypt.

THEOPHRASTOS from Lesbos (d.285 B.C.). He wrote a famous "Enquiry into Plants" which has given us many valuable information about the plant drugs at that period.

DIOSCORIDES was another famous Greek herbalist. His "Materia Medica" appeared in 78 A.D. The Islamic world got acquainted with it when a copy was presented to Abdel Rahman III in Spain by the Roman Emperor in 948 A.D., who sent the monk Nicholas to explain it to the learned world.In A.D. 512 a Byzantine illustrated his book with drawings. These are among the oldest known botanical illustrations, and they have given us the key to which plants the Greek names refer. This valuable manuscript is kept in Vienna.

CALENOS : of Pergamos (Asia Minor) (120-200 A.D.) and ORt' BASIUS, physician to the Roman Emperor, c. 390 A.D.. are two other famous herbalists who have publications from this early period on medicinal plants .

During the early Islamic period we have several great names among oriental herbalists . In the beginning the Christian physicians were the leading, :

THIYADUQ : (d. 708 A.D.) and HUNAIN BEN ISHA) (809877 A.D.) . The latter wrote about 100 original books and 150 translations. He is especially known for his translations of Galleons and Disocrides into Arabic.

From the 10 th cent . onwards the Muslim scholars started leading . Among the most famous of this century are :

RAZI or RAZES (865 - 925 A.D.), a persian muslim who lived in Rayy in Persia, and who together with Ibn Sina are considered the greatest physicain of the Islamic world. He is the author of not less than 250 books on various subjects, among which 20 volumes on Therapeutics .

From the 10th century are also known IBN GULCUL, Hispano -Moorish physicain of the Caliph Hisham II in Cordoba . And Al MAGUSI (d. 994), Persian-Muslim physician who worte a fine encyclopdia on Medicine , in Arabic called " The Royal" (El-Malaki), later translated into Latin .

From the 11th certury two great scientists should be remembered :

IBN SINA : (980 - 1036), Persian Muslim and among the greates physicians and philosophers of the Islamic world . He wrote a work on medicine with a section on drugs, that has been reprinted in Arabic in modern times .

El - BIRUNI : (963 - 1048), a Muslim at the court of the Sultans of Afghanistan, is considered the most original of all Islamic scientists . He worte an important Materia Medica with plant names in various oriental languages .

In the 12th cent ., there are several outstanding scientists .. The following should be remembered :

MATIMONIDES : (1135 - 1204), from Cordoba. He went to Morocco, later to Egypt as physician to Sultan and his sons . He wrote a book in poisons etc. which was edited in 1940 by M. Meyrhof .

EL I RISI (1100 - 1166), a Muslium prince and famous geographer, who lived as a refugee at the court of the Norman Kings of Sicily . Wrote a phaemacognosy " The Universal Collection " , of which a part has recently been discovered in Istanbul .

AHMAD EL GHAFIOI (d. 1164), from Andalusia, physician, excellent scholar, the most important of all Islamic phramacognosists. Wrote a book on simple drugs gased on own observations and also with quotations from all pharmacological authors at his time . The original book is lost , but an abbreviated copy was found in Cairo and has been puplished by M. Meyerhof and G.P. Sobhy .

In the 13th cent . The most important scholar is :

IBN EL BEITAR : (d. 1248), from Malaga. Travelled in North Africa, died in Damascus, has written a large phamacopoeia in Arabic which has been translated into several European languages . He was considered the greates Islamic pharmacognosist until it was discovered recently that his book is copied almost entirely from that of El-Gfirqi

The phamacopoeias used at present by the Egyptian Attareen .

IBN Sina : (980 - 1036) , see above .

KOHEN EL-ATTAR • Worte in 1245 " The management of the shop " in 25 chapters . Reprinted in numerous editions and still frequently used .

DAWUD OMAR EL ANTAKI (d. 1599). Wrote di!- Meth6- randum for intelligent people " with a list of drugs and medical terms . Reprinted in numerous editions and much favour among Oriental druggists .

There is a modern Egyptian Pharmacopoeia, huge book printed at Cairo University by the Faculty of Pharmacy . This is employed by the modern drug shops in Cairo and deals with the ordinary official drugs, sold in th internationl market . This pharmacopoeia is not yet known by the Attareen who prefer their old traditional books .

SOME COMMON DRUGS ON SALE AT THE ATTAREEN

About 250 drugs are found on sale . Many of then have certainly no value but are merely connected with superstition and ancient traditions . Some of them , however , may have great value . In the Egyption research laboratories investigations of the native drugs is getting on at present in order to discover whether they contain any active principles or not .

During these investigations, the active principle of the seeds of e.g. *Ammi majus* was discovered . The discovery led to the inclusion of the plant in European Pharmacopoeias.

A few of the most well - known drugs on sale at the Attareen are enumerated here .

For fever :

CINCHONA CALISAYA : (Rubiaceae), Qishr el kina , the bark. Exists in red, brown and yellow varieties, the brown is considered the best

For headache :

ECBALLIUM ELATERIUM : (Cucurbitaceae), Faqus al Ho-mar, the root.

Purges : *RICINUS COMMUNIS* (Euphorbiaceae), Kharwa, oil from the seeds .

CASSIA ACUTIFOLIA (Leguminosae), Senna mekky, leaves, legumes .

SOLENOSTEMMA ARGEL : (Asclepiadaceae), Argel, leaves used for the falsification of the true senna .

CASSIA FISTULA : (Leguminosae), Khiar shanbar, the pulp of the legume .

BRYONIA CRETICA and B. DIOICA (Cucurbitaceae) , Laeba morra, root .

TAMARIND US INDICA : (Leguminosae), Tamr hindy, pulp of legume .

CITRULLUS COLOCYNTHS : (Cucurbitaceae), Handhal, the fruit **Refreshing drinks**

HIBISCUS SABADARIFFA : (Malvaceae) Karkade, calyx and fruits .

ORCHID : (Orchidaceae), Sahleb, the tuberous root .

SALVIA TRILOBA : (Labiatae) and PULICARIA UNDULATA (Compositae); Shy gebl, the leaves a good tea .

ROSA GALLICA : (Rosaceae), Zirr ward, the flowers. Also used in sweets and in outward application for eye diseases .

THYMUS CAPITATUS : (Labiatae), Zater, for scenting tea and as chest medicine .

TAMARINDUS INDICA, See above .

Vermifuge :

CHENOPDIUM AMEROSIOIDES : (Chenopodiaceae) , Nitnah. An oil extracted from the plant used for Ancylostomiases

ARTEMISIA HERBA - ALBA : (Compositae), Shih, the whole plant .

LUPINUS TERMIS : (Leguminosea) , Tirmis, the seed . Toothbrushes.

Toothpicks :

SALVADORA PERSICA : (Salvadoracea) , Meswak. Branches used as toothbrushes .

AMMI VISNAGA : (Umbelliferae) , khilla . Umbelrays used as toothpicks .

For washings :

SAPONARIA OFFICINALIS , GYPSOPHILA ROKEJEKA & SILENE SUCCULENTA : (all Caryophyllacea) Erq halawa, the roots .

GNAPHALIUM LUTEO - ALBUM and G. PULVINATUM : (Compositae) , Sabonetel afrit . The whole plant is put in bath water at Sham en-Nessim .

Also known as Ghara Ajub . For chest diseases :

ADIANTUM CAPILLUS - VENERIS: (Polypodiaceae), Kuzbaret et bir, the leaves

GLYCYRRHIZA GLABRA: (Leguminosae), Erq souss, the roots

ALTHAEA OFFICINALIS: (Malvaceae), khattmiya, root and flowers.

PUNICA GRANATUM: (Punicaceae), Qishr roman, bark and flowers.

ZINGIBER OFFICINALE: (Zangabil), and ALPINIA OFFICINARUM. khlingan (both Zingiberaceae) , roots in hot syrup for cold .

For fattening:,

GLOSSOSTEMON BRUGUIERI : (Sterculiaceae), Moghat, the root .

COLCHICUM RITCHII : (Moringaceae). Habb el bann, the seed an oil from it.

PISTACIA LENTISCUS : (Anacardiaceae), Habba khardra, the fruit .

Diuretic and for bladder stones :

AMMI VISNAGA : (Umbelliferae); khilla , the seeds .

ZEA MAYS : (Gramineae), Shawashi ed-dura, the styles . DAUCUS CAROTA : (Umbelliferae), Bizr gazar, the seeds . PIPER CUBEBA : (Piperaceae) , kababa hindi or kababa sini, the fruits .

It also enters in the native spice Bohar .

Toxic mixtures :

DATURA SUAVEOLENS : (Solanaceae) , Tatura . Also smoked for asthma and bronchitis , the whole plant .

PEGANUM HARMALA : (Zygophyllaceae), Bizr harmal, the seeds and capsules. Vomitive, diuretic , somniferous , sudorigic, emmenagogue .

URGINEA MARITIMA : (Liliaceae) Habb el far, Basal el onsul .

The dried sliced bulbs a rat poison. Also expectorant, cardiac. The seeds used for aphrodisiac purpose .

SEMESCAPUS ANACARDIUM : (Anacardiaceae), Baladher. The resin inside the shell of the fruit for intoxication . Also corrosive for warts, tubers .

HYOSCYAMUS MUTICUS : (Solanaceae) , Sakaran . The leave and seeds are smoken mixed with tobacco for asthma . Narcotic , seeds . Also carminative , diuretic , emmenagogue , powdered in honey for leprosy , etc . Important constituent for intoxicating prepartions

For Evil Eve And Protective Purpose :

ABRUS PRECATORIUS : (Leguminosae), Ain el afrit, the red seed with black spot resembles an eye . It is used powdered , dry for eye diseases ; Shishm ahmar , Also enters in the incense Bokhur .

Protective are also ALOE, Sabara, ALLIUM, Bassal, and TRITICUM , Baraqa el qamh . Also all sorts of incence are frequently used for evil spirits .

For dues :

RUBIA TINCTORUM and *R. CORDIFOLIUM :* (Rubiaceae) , Foua, red dye, root . Also tonic , especially after child's birth .

CARTHAMUS TINCTORIUS : (Compositae), Osfur, flowers a yellow dye .

ALKANNA TENCTORIA : (Boraginaceae), Rigl el hammama . Root gives red dye .

LAWSONIA INERMIS : (Lythraceae), Henna . The powdered leaves yield a brown-red colour .

CURCUKA LONGA : (Zingiberaceae), Oruq sofr. Root yellow dye, also diuretic ,

For tanning :

ACACIA ARABICA (Leguminosae) , Qarad , the pods . Decoction of seeds also for diarrhoea and in poultice for wounds .

Emmenagogue and various other purposes :

ANASTATCA HIEROCHUNTICA (Cruciferae) , Kaff Mariam , the whole plant used in connection with child's birth .

ROSMARINUS OFFICINALIS (Labiatae) , Hassalban , the whole plant . Outward in frictions and fumigation . Inward as a tonic , stimulant , especially for epileptic and paralytc dieseaes .

IRIS FLORENTINA (Iridaceae) Qormet el banaffseg . The rhizome in applications , linments , cataplasms . It is irritant , incisive , detersive . Also used for perfume .

ALOE SUCCOTRINA (Liliaceae) , Sabr murr of Sabr soqottry The gum eaten or smoked Drastic , heating , detersive .

BALSAMODENRON sp . (Burseraceae) , Mourr hegazi . The gum stimulant , astringent , expectorant , balsamic , antispasmodic , etc

Bark Condiments.

CINNAMOMUM ZEYLANICUM (Lauraceae) ; Qirfa . *C. CASSIA (Lauraceae)* , Salikha .

Root condiments :

ZINGIBER OFFICINALE , Zangabil or Ganzabil ,see above .

ALPINIA OFFICINARUM (Zingiberacesae) , Kholingan . *CURCUMA ZERUMBER (Zingiberaceae)* , Zoronbad . **Seed condiments :**

NIGELLA SATIVA (Ranunculaceae) , Habba soda , Habbet el baraqa .

SESAMUM INDICUM (Pedaliaceae) , Simsim . *FOENICULUM VULCARE (* Umbelliferae) , Shammar. *CORIANDRUM SATNUM* , (Umbelliferae) Kozbara *CARUM CARVI (* Umbelliferae) , Karawy

MYRISTICA FRAGRANS (Myristicaceae) , Goz el tib,. *ELET7'ARIA MAJOR (Zingiberaceae)* , Habbahann habashy . *E.CARDAMOMUM (* Zingiberaceae) , Habbahann .

LINUM USTATISSIMUM (Liriaceae) , Bizr Kittan . In poultice for wounds , Plasters

EXPLANTION OF PHARMACOLOGICAL TERMS

Purge , Purgative for cleaning the bowel . Same as laxative .

Vermifuge : expelling intestinal worms .

Astringent : binding together

Diuretice , exciting discharge of durin .

Diaphoretic , exciting perspiration . Detersive , cleaning .

Expectorant , promoting ejection from chest or lungs by spitting .

Antispasmodic , remedy for spasms .

Drastic , acting very strongly, especially about purgatices .

Vomitive or Emetic , causing vomiting .

Stimulant , causing rapid increase of vital energy .

Sudorific , as diaphoretic . Tonic , serving to invigorate . Cardiac , heart - stimulating. Incisive , Sharp .

Corrosive , to corrode , destroy gradually .

Somniferous , inducing sleep . Narcotic , the same .

Aphrodisiac ,producing sexual desire .

Emmenagogue , Promoting menstruation .

Concerning medicinal plants it is of importance to study how their active principles change with various soil and climatic conditions Our common *Hyoscyamus muticus* from the desert , looses much of its alkaloids when grown under irrgation . Datura - species that are grown in Egypt , loose certain of their alkaloids which they possess when grown in other countries .

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