Practical part

Botany 8

Fourth year- Biology & Geology students

Professors

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Practical part

Sterilization

Kills or eliminate of microorganisms from surface, tools, equipment and biologically culture media.

Different sterilization methods used in the laboratory

Sterilization can be achieved by a combination of heat, chemicals, irradiation, high pressure and filtration like steam under pressure, dry heat, ultraviolet radiation, gas vapor sterilants, chlorine dioxide gas etc. Effective sterilization techniques are essential for working in a lab and negligence of this could lead to severe consequences, it could even cost a life.

Methods of sterilization

1- Physical methods

2- Chemical methods

3- Mechanical methods

4- Radiation methods

Physical methods

Heat Method: This is the most common method of sterilization. The heat is used to kill the microbes in the substance. The extent of sterilization is affected by the temperature of the heat and duration of

heating. On the basis of type of heat used, heat methods are categorized into:

A-Dry heat

A-Moist Heat/Steam Sterilization- In most labs, this is a widely used method which is done in autoclaves.. Autoclaves use steam heated to 121°C under 1.5 pressure for 20 minute. This is a very effective method that kills/deactivates all microbes, bacterial spores and viruses. Autoclaving kills microbes by hydrolysis and coagulation of cellular proteins, which is efficiently achieved by intense heat in the presence of water. The intense heat comes from the steam. Pressurized steam has a high latent heat and at 100°C it holds 7 times more heat than water at the same temperature. In general, Autoclaves can be compared with a typical pressure cooker used for cooking except in the trait that almost all the air is removed from the autoclave before the heating process starts. Wet heat sterilization techniques also include boiling and pasteurization.

B- Dry heat sterilization

In this method, specimens containing bacteria are exposed to high temperatures either by flaming, incineration or a hot air oven. Flaming is used for

metallic devices like needles, scalpels, scissors, etc. Incineration is used especially for inoculating loops used in microbe cultures. The metallic end of the loop is heated to red hot on the flame. The hot air oven is suitable for dry material like powders, some metal devices, glassware, etc.

A- Direct flame

by exposure the loops to direct flame till incineration**.**

Here, the substance is exposed to the flame for just a few minutes. The flame will burn out the microbes directly.

B- Alcholic flaming

by immerge the tools in ethanol then to direct flame.

C- Hot air oven

The application of hot air oven is dry materials like glassware, heavy metals, thermostable materials etc.

Condition of sterilization in hot air oven 140-160 temperature

For 4-6 hours.

Chemical method of sterilization: Heating provides a reliable way to get rid of all microbes, but it is not always appropriate as it can damage the material to be sterilized. In that case, chemical methods for sterilization is used which involves the use of harmful

liquids and toxic gases without affecting the material. Sterilization is effective using gases because they penetrate quickly into the material like steam. There are a few risks, and the chances of explosion and cost factors are to be considered.

The commonly used gases for sterilization are a combination of ethylene oxide and carbon-dioxide. Here Carbon dioxide is added to minimize the chances of an explosion. Ozone gas is another option which oxidize most organic matter. Hydrogen peroxide, Nitrogen dioxide, Glutaraldehyde and formaldehyde solutions, Phthalaldehyde, and Peracetic acid are other examples of chemicals used for sterilization. Ethanol and IPA are good at killing microbial cells, but they have no effect on spores

Mechanical methods

Filtration is the quickest way to sterilize solutions without heating. This method involves filtering with a pore size that is too small for microbes to pass through. Generally filters with a pore diameter of 0.2 um are used for the removal of bacteria. Membrane filters are more commonly used filters over sintered or seitz or candle filters. It may be noted that viruses and

phage are much smaller than bacteria, so the filtration method is not applicable if these are the prime concern.

-types of filter

Zytes filterate

Memberane filters

Consist from cellulose acetate or cellulose nitrate.

Radiation sterilization:

This method involves exposing the packed materials to radiation (UV, X-rays, gamma rays) for sterilization. The main difference between different radiation types is their penetration and hence their effectiveness. UV rays have low penetration and thus are less effective, but it is relatively safe and can be used for small area sterilization. X-rays and gamma rays have far more penetrating power and thus are more effective for sterilization on a large scale. It is, however, more dangerous and thus needs special attention. UV irradiation is routinely used to sterilize the interiors of biological safety cabinets between uses. X-rays are used for sterilizing large packages and pallet loads of medical devices. Gamma radiation is commonly used for sterilization of disposable medical equipment, such as syringes, needles, cannulas and IV sets, and food.

Ultraviolet light is effective for controlling microbes in the food substance. It has a higher wavelength that lies between 100 nm and 400 nm. The energy is about 265nm, which is strong enough to destroy microbes. When microbes are subjected to radiation, ultraviolet radiation penetrates into the core DNA and thymine molecules. During the process of photosynthesis, the linked thymine molecules could not align the adenine of RNA molecules, as a result, the molecular structure changed. Further, the chromosome replication is impaired. Since this microorganism is damaged, it cannot produce proteins and dies shortly.

Culture media

Classification of culture media according to:

1- Uses

2-Chemical structure

3- Natural state

1- According to uses

A- Routine laboratory media

B- Enriched media

C- Selective media

D- Differential media

E- Assay media

F- biochemical media

A- Routine laboratory media

Raw material of animal or plant origin such as malt extract, yeast extract and pepton.

B- The Enrichment Culture Media

This is a liquid medium which allows the microorganisms to multiply and has the essential nutrients that are required for it.

Contain substance to accelerate growth such as vitamins and protein.

C-Selective media

This is a special type of media which allows the growth of certain

microorganisms while inhibits the growth of the others.

D- Differential Culture Media

This is a media that is used for differentiating between bacteria by using an identification marker for a specific type of microorganism.

The selective and differential culture media are opposites to each other in a way that one inhibits the growth of other organisms while allowing the growth

of some while the other does not kill the others but only highlights one type.

E-Assay media

These media are used for the assay of vitamins, amino acids, and antibiotics. E.g. antibiotic assay media are used for determining antibiotic potency by the microbiological assay technique

F- biochemical media

Differentiate between organisms due to their biochemical activities.

Classification of culture media on the basis of natural state

Solid medium contains agar at a concentration of 1.5-2.0% or some other, mostly inert solidifying agent. Solid medium has physical structure and allows bacteria to grow in physically informative or useful ways (e.g. as **colonies** or in streaks). Solid medium is useful for **isolating bacteria** or for determining the colony characteristics of the isolate.

Semisolid medium

Semisolid medium is prepared with agar at concentrations of 0.5% or less. Semisolid medium has a soft custard-like consistency and is useful for the

cultivation of **microaerophilic bacteria** or for the **determination of bacterial motility.**

Liquid (Broth) medium

These media contain specific amounts of nutrients but don't have a trace of gelling agents such as gelatin or agar. Broth medium serves various purposes such as propagation of a large number of organisms, fermentation studies, and various other tests. e.g. **sugar fermentation tests, MR-VP broth**

Classification of culture media on the basis of chemical structure

1- Synthetic media

Consisted from chemical substance with known chemical structure and known ingriedents.

For example

Czapek-Dox medium, is a growth medium for propagating fungi and other organisms in a laboratory.

Sucrose	10
Sodium nitrate	3
potassium di hydrogen phosphate	1
Magnesium sulphate	0.5
Potassium chloride	0.5
Chloramphenicol	0.5
Agar	20

Czapek`s medium components:

Glucose 10 g

Sodium nitrate 3 g

Potassium dihydrogen phosphate 1 g

Magnesium sulphate 0.5 g

Potassium chloride 0.5 g

Ferrous sulphate 0.01 g

Distilled water 1 litre

2-Semi synthetic media

Consisted from two parts

Chemical substance with known chemical structure and known ingredients

and natural substance with un known chemical structure.

For example Potato Dextrose Agar media

3- Natural media

Consisted from natural substance raw materials with animal and plant origin such as yeast extract, Malt extract and peptone

Determination of fungal growth:

1) **Mycelial dry weight**

- Take filter paper and weight it (w1)
- Filter the contained of conical flask which contain fungal growth
- Dry the filter paper in oven at 90-100℃
- Weight the filter paper after drying (W2)
- Fungal growth=W2-W1

2) Linear method:

- Inoculate petri plat contain solid media with special type of fungi
- Incubate it in incubator and after period of time measure the length of fungal growth on petri plate (by measuring diameter)
- Fungal growth=(length + width)/2

3)Photometric method:

Used for determinate the growth of monocellular fungi such as yeast or fungi has short hyphae

- Take light source which have mean intensity
- Expose the fungal growth in the liquid medium to this light source
- Measure the intensity of light that pass through the medium

- If the intensity of light is semi similar to the initial intensity , this mean the fungal growth is small
- If the intensity of light is smaller than the initial intensity , this mean the fungal growth is big

Isolation of fungi from different sources

There are two type of fungi we can isolated:

1) **epiphytic fungi** is a fungus that grows upon, or attached to, a living plant. The term epiphytic derives from the Greek *epi-* (meaning 'upon') and *phyton* (meaning 'plant').

2) Endophytic fungi are microfungi that internally infect living plant tissues without causing any visible manifestation of disease and live in mutualistic association with plants for at least a part of their life cycle. The term endophytic derives from the Greek *endo-* (meaning within') and *phyton* (meaning 'plant').

Isolation of Epiphytic fungi:

Isolation of fungi from soil by dilution-plate method:

1) The serial dilution method was used to dilute the soil sample with the purpose of minimizing the fungi in the soil in each dilution and this serial

make by put 1 g of soil in sterile conical flask contain 100 ml distilled water and shaking very well then take 10 ml from this conical by using pipette and put them in sterile conical flask contain 90 ml dist. water and so on.

2) Take 1 ml of best dilution and put it in sterile Petri-dish.
3) Pour sterile culture medium in Petri-dish.
4) The plates were gently rotated clockwise and anticlockwise to ensure uniform distribution of homogenates and then incubated at 27°C for 7 days.
5) Identify and count the obtain fungal colonies
6) Record the results and determine the suitable dilution

Results

Dilution	Fungi

Isolation from Air (Airborne fungi):

1) Prepare the suitable culture medium (**Czapek`s medium)** and put it in autoclave for sterilization.
2) Pour sterile culture medium in sterile Petri-dish and let them for solidification.
3) Open Petri-dish in air for 15 min. then closed it.
4) then incubated it in incubator at 27°C for 7 days.
5) Identify and count the obtain fungal colonies
6) Record the results

Results

Airborne fungi

Determination of Seed-Borne fungi:

1) The dilution plate method was used for the estimation of seed-born fungi.
2) 20g of seeds (Wheat) were put in 100 ml of sterile distilled water and 10ml of the suspension were removed and placed in 90 ml of sterile distilled water and shaken very well.
3) Take 1 ml of every dilution and put it in sterile Petri-dish.
4) Pour sterile culture medium in Petri-dish.
5) The plates were gently rotated clockwise and anticlockwise to ensure uniform distribution of homogenates and then incubated at 27°C for 7 days and the numbers of fungi were calculated per g wheat seeds.
6) Identify and count the obtain fungal colonies
7) Record the results

Results

seedborne fungi

Determination of Seed-Plane fungi:

1) Seeds were surface-disinfected by put seeds in 0.4% sodium hypochloride for 2 min and then washing seeds in 50ml sterile distilled water.
2) Then use sterile filter paper for drying seeds.
3) Four particles were placed into each of 3 plates containing media.
4) then incubated them in incubator at 27°C for 7 days.
5) Identify and count the obtain fungal colonies
6) Record the results

Results

Seed-plane fungi

Seed plane fungi

Determination of Rhizosphere fungi:

1) It was carried out according to the dilution plate methods, 1 gm of root of desired plant was placed in flask contain 100 ml sterile dist. Water after washing them with tap water. These flask was shaken for 30 min.
2) 10 ml of this suspension were taken by pipette and transferred into a flask contain 90 ml of sterile water. Further dilutions were made in the

same way until the desired final dilution is reached.

3) One ml of suspension was transferred to sterile petri-dish and covered with melted but cooled agar medium.
4) The plates were gently rotated clockwise and anticlockwise to ensure uniform distribution of homogenates and then incubated at 27°C for 7 days.
5) Identify and count the obtain fungal colonies
6) Record the results

Results

Rhizosphere fungi

Determination of Rhizoplane fungi:

1) The roots were subjected to a series of washing with sterile distilled water.
2) Dried them by using sterile filter papers.
3) Cut them into equal segments (1cm each).
4) Four particles were placed into each of 3 plates containing media.
5) then incubated them in incubator at 27°C for 7 days.
6) Developing fungi were counted, identified and calculated / root segments.

Determination of phyllosphere fungi:

1) A known weight of plant leaves segments were placed in sterile conical flask containing 100 ml sterile distilled water.
2) Flask were shaken by hand for 10 min. 10 ml of this suspension were taken by pipette and transferred into a flask contain 90 ml of sterile water. Further dilutions were made in the same way until the desired final dilution is reached.
3) One ml of suspension was transferred to sterile petri-dish and covered with melted but cooled agar medium.

4) The plates were gently rotated clockwise and anticlockwise to ensure uniform distribution of homogenates and then incubated at 27°C for 7 days.
5) Developing fungi were counted, identified

Results

phyllosphere fungi

Determination of phylloplane fungi:

1) The plant leaves were subjected to a series of washing with sterile distilled water.
2) Dried them by using sterile filter papers.
3) Cut them into equal segments (1cm each).
4) Four particles were placed into each of 3 plates containing media.

5) then incubated them in incubator at 27°C for 7 days.
6) Developing fungi were counted, identified and calculated / leaf segments.

Results

phylloplane fungi

***Isolation of endophytic fungi**

1) Collect the desired plant leaves
2) Thoroughly washed in with tap water
3) Cut them into equal segments (1cm each).
4) Surface-disinfected by soaking in 70% ethanol for 1 min.

5) Followed by soaking in 0.1% mercuric chloride ($HgCl_2$) solution for 2 min.

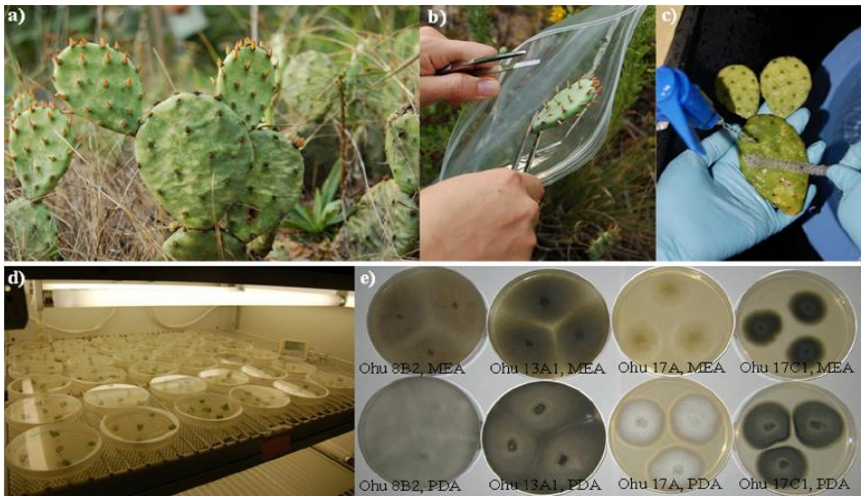
6) Then soaked in 70% ethanol for 1 min.

7) Rinsed in sterile demineralised water for several times

8) Dried them by using sterile filter papers.

9) Four particles were placed into each of 3 plates containing media.

10) Then incubated them in incubator at 28°C for 2-3 weeks.



Effect of some environmental factors on fungal growth

A-Effect of temperature

1) Prepare liquid media and put 50ml of these media in different conical flask then sterilize them
2) After sterilization let the conical for cooling then put one disk of fungi that was growing on solid media on each conical flask under sterilized conditions.
3) Put the conicals in incubator at different temperatures; 20, 30, 40 and 60 for 7 days
4) Filtrate conicals, Drying filter paper which contain fungal growth on oven at 90℃ for some hours until the weight become stable.
5) Draw the relationship between the fungal growth and different carbon sources then write your comment.

   Fungal growth =wt of filter paper with mycelium – wt of filer paper before filteration

B-Effect of different incubation peroids

1)Prepare liquid media and put 50ml of these media in different conical flask then sterilize them

2)After sterilization let the conical for cooling then put one disk of fungi that was growing on solid media on each conical flask under sterilized conditions.

3)Put the conicals in incubator at the optimum temperature for 2, 4, 6, 8, and 10 days

4)Filtrate conicals, Drying filter paper which contain fungal growth on oven at 90℃ for some hours until the weight become stable.

5)Draw the relationship between the fungal growth and different incubation peroids then write your comment.

Note: Fungal growth =wt of filter paper with mycelium – wt of filer paper before filteration

C-Effect of different carbon sources on fungal growth:

1) Prepare liquid media without carbon sources and put 50ml of these media in different conical flask then weight different carbon sources on each conical flask (glucose, fructose, maltose, cellulose, starch) then sterilized them
2) After sterilization let the conical for cooling then put one disk of fungi that was growing on solid media on each conical flask under sterilized condition.
3) Put the conicals in incubator at better temperature and better incubation period from pervious experiments.
4) Filtrate conicals, Drying filter paper which contain fungal growth on oven at 90℃ for some hours until the weight become stable.
5) Draw the relationship between the fungal growth and different carbon sources then write your comment.

   Fungal growth =wt of filter paper with mycelium – wt of filer paper before filteration

D-Effect of different nitrogen sources on fungal growth:

1) Prepare liquid media without nitrogen sources and put 50ml of these media in different conical flask then weight different nitrogen sources on each conical flask then sterilized them
2) After sterilization let the conical for cooling then put one disk of fungi that was growing on solid media on each conical flask under sterilized condition.
3) Put the conicals in incubator at better temperature and better incubation period from pervious experiments.
4) Filtrate conicals, Drying filter paper which contain fungal growth on oven at 90℃ for some hours until the weight become stable.
5) Draw the relationship between the fungal growth and different nitrogen sources then write your comment.

   Fungal growth =wt of filter paper with mycelium – wt of filer paper before filteration

Extraction of Antibiotic

Antibiotics:

compounds or substances that combat bacterial infections and kill or slow down their growth, comprise one of the most important groups of drugs in the fight against infectious diseases. Representing around 13% of total pharmaceutical consumption, they have the highest market share of any pharmaceutical product.

Extraction of Antibiotic from fungi:

this experiment has two stage

At solid media:

1)Prepare czapek's ager medium without adding antibiotic, then sterilized it in autoclave

2) Pour the media in sterile petri-dishes and let them for solidification

3)Inoculate them with different strain of fungi

At liquid media:

5) Prepare liquid czapek's medium without adding antibiotic, then sterilized it in autoclave

6)By using sterile cork borer, take disc from fungal growth in the pervious dishes and inoculate 50 ml of liquid medium with this disc

7)Incubate them in incubator at 28℃ for 7 days

8)After incubation, add any solvent organic such as chloroform (20 ml) to conicals and put these conicals on shaker for one day

9) Filtrate the conicals and keep with filtrate

10) By using separating funnel, separate the layer of chloroform which contain antibiotic in clean plate and let it for evaporation

(11) After evaporation, the antibiotic remained in plate at power, we can dissolve it again with chloroform

12)Take discs of filter paper and put them in antibiotic for saturation

13)Put these discs in solid media which inoculate with different type of bacteria

14) Incubate them in incubator at 28℃ for 1 days

The observation:

If the result is positive, mean appearance of clear zone

Figure 4 Antimicrobial actyivity against [A] S. *aureus* [B] S. *typhimurium* [C] E. *Coli* (D] C. *albicans* using fungal Crude extract of *Thielaviopsis basicola*.

Screening for α-amylase activity:

1) The fungal isolates were subcultured on the following medium containg gmL 1; yeast extract 1.5, peptone 0.5, sodium chloride 1.5, starch 10, agar 15.

2) make the media of the pH similar with pH 5.6.

3) The isolates were inoculated on sterile solidified starch agar plates a blank without inoculation was also maintained for comparison.

4) Then the plates were incubated at room temperature for 120 hours

5) after that all the plates along with blank was flooded with iodine and observed for zone of hydrolysis

Observation:

*Apperance of clear zone around the fungal growth means starch hydrolysis (amylase producer)

*Apperance of blue colour means the isolates were negative for amylase production.

Screening for l-asparaginase production:

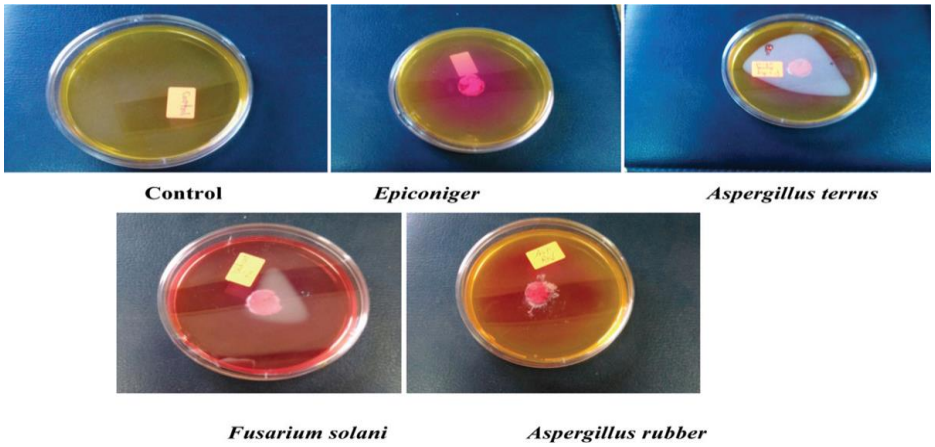
The method described by (**Gulati et al., 1997**) was employed for screening the ability of the selected isolates to produce l-asparaginase on Modified Czapek Dox (MCD) medium with chemical composition (g/L): glucose, 2; L-asparagine, 10; KH_2PO_4, 1.52; KCl, 0.52; $MgSO_4.7H_2O$, 0.52; $FeSO_4.7H_2O$, 0.01 and agar 20. Three mL of phenol red stock solution, (2.5 g of phenol red dissolved in 100 ml ethanol, pH 6.2) was added to 1L of MCD medium. The plates were then

inoculated with a mycelium disc (8mm), cut from the edge of the culture plate and incubated at 28±1^{o}C for 48 h. Pink zone appearance around the fungal disc resulted from ammonia liberation indicated l-asparaginase production.

Observation:

*Apperance of pink zone around the fungal growth means l-asparagine hydrolysis (l-asparaginase producer)

*No change in the yellow colour means the isolates were negative for l-asparaginase production.



L- asparaginase production by some fungal isolates

L-aspargine (amino acid) ⟹ asparatic acid+ NH_3

Mycotoxins determination in fungal filtrate:

1- Cultivation of the fungal strains. The tested strains were inoculated into flasks containing 50 ml of sucrose yeast extract liquid medium (SYE) with the chemical composition (40 g sucrose, 20 g yeast extract and 1000 mL distilled water). The flasks were incubated at 28°C for two weeks **(Gabal et al., 1994)**.

2-Determination of the mycotoxin content. The mycotoxins concentrations were determined by fluorometric technique using standards of tested toxins for adjustment of fluorometer before reading the toxins content of the tested samples (**Hansen, 1993; VICAM, chemists. Inc., U.S. America).** The extract was filtered through a fluted filter paper then diluted (1:4) with sterilized distilled water and refiltered through glass-fiber filter paper. Two ml of the glass-fiber filtrate was placed on an aflatoxin or ochratoxin Test RWB SR (VICAM) column and eluted at 1-2 drops/s. The columns were washed two times with 5 ml water. For eluting the toxins 1ml of High Performance Liquid Chromatography(HPLC)- grade methanol was

added to the column. A bromine developer (1 ml) was added to the methanol exract and the total aflatoxins and ochratoxins were read after calibration VICAM Series-4 fluorometer set at 360 nm excitation and 450 nm emissions

Practical part

What is Flora?

Flora is all the plant life present in a particular region or time, generally the naturally occurring native plants. The corresponding term for animal life is **fauna**. Flora, fauna, and other forms of life, such as fungi, are collectively referred to as biota.

Flora is the name given to the collective plant life that grows or once grew in a certain area or during a given time period. It usually refers to the native plant life present but does include new species that have been introduced as well. The flora and fauna of the earth have names derived from Latin.

In the language, ‘Flora’ was a goddess of flowers and plants. In the Roman mythology, she was the goddess of fertility. And so, the plant kingdom came to be known as Flora. The study of the plant life around the world is very interesting since is makes different classifications of the flora.

Herbarium is defined as a collection of plants that usually have been dried, pressed, preserved on sheets and arranged according to any accepted system of classification for future reference and study.

A voucher herbarium specimen is a pressed plant sample deposited for future reference. It supports research work and may be examined to verify the identity of the specific plant used in a study. A voucher specimen must be deposited in a recognized herbarium committed to long-term maintenance.

Methods of preparation of herbarium specimens:

The preparation of an herbarium involves:

(i) Field visits,

(ii) Collection of specimens,

(iii) Drying,

(iv) Mounting on an herbarium sheet,

(v) Preservation,

(vi) Labelling and

(vii) Proper storage.

(a) Field visits and specimen collection:

A complete specimen possesses all parts including root system, flowers and fruits. Therefore, regular field visits are necessary to obtain information at every stage of

growth and reproduction of a plant species. In the fields, the tools required are mainly trowel (digger) for digging roots, scissors and knife for cutting twigs, a stick with a hook for collection of parts of tall trees, a field notebook, polythene bag, old newspaper and magazines.

To avoid damage during transportation and preservation at least 5- specimens of a plant should by collected. The collected specimens are transported in a vasculum (specimen box) to prevent willing, livery collected specimen must be tagged with a field number and necessary information should be recorded in a field notebook.

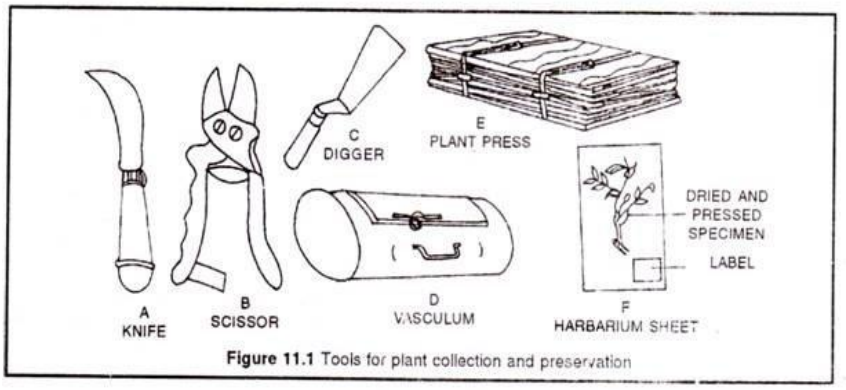


Figure 11.1 Tools for plant collection and preservation

(b) Pressing and drying:

The specimens are spread out between the folds of old newspapers or blotting sheets avoiding overlapping of parts. The larger specimen may' folded in 'N' or' W'

shapes. The blotting sheets with plant specimen should be placed in the plant press for drying. After 24 to 48 hrs. the press is opened.

(c) Mounting:

The dried specimens are mounted on herbarium sheets of standard size (41 x 29 cm). Mounting is done with die help of glue, adhesive or cello tape. The bulky plant parts like dry fruits seeds, cones etc. are dried without pressing and are put in small envelops called fragment packets. Succulent plants are not mounted on herbarium sheets but are collected in 4% formalin or FAA (Formalin Acetic Alcohol).

(f) Preservation:

The mounted specimens are sprayed with fungicides like 2% solution of mercuric chloride.

(e) Labelling:

A plant specimen is incomplete without label data. Label data is a form of field data and must be accurate. The following are important elements:

- **Scientific name**: genus, species, authority, infraspecific information

- **Determiner of the scientific name**: the name of the person who identified the plant
- **Detailed location**: the location is used by researchers on several levels:
    - for general mapping to region, county or province.
    - for detailed mapping, as in GIS computer applications.
    - to physically locate the plant(s) in order to obtain further research material. The location should consist of country, state or province, county or municipality and a description of the location in reference to roads, road junctions, mile markers and distances from cities and/or towns. Latitude and longitude, section, township and range, and elevation may also be helpful. A location taken with a Global Positioning System (GPS) is a desirable complement to the locality description. GPS coordinates MUST include a datum!

- **Habitat**: the type of plant community where the plant is growing and, if known, other plants growing in association
- **Plant habit**: describes the form of the plant (tree, shrub, vine, herb) and its height. Examples: tree, ca. 50 ft. tall. sprawling herb
- **Frequency**: is the plant rare, occasional, frequent or common?
- **Plant description**: describe characteristics of the plant which may be lost upon drying, such as flower/fruit color and fragrance, leaf orientation and aroma
- **Collector name**: it is recommended that the collector be consistent and use their full first name, middle initial (or full name) and full last name.

- **Collection number**: a sequential straightforward numbering system (1,2, 3, ...) is preferable.

South Valley University Herbarium **Faculty of Science at Qena**
Scientific name : **Common name :** **Family Name :** **Locality :** **Date of collection :** **Leg. :** **Det. :**

- **Date of collection**: a format with the month spelled out or abbreviated and 4-digit year will prevent confusion. e.g., 3 May 2003, not 3/5/03 or 5/3/03.

(f) Storage:

Properly dried, pressed and identified plant specimens are placed in thin paper folds (specimen covers) which are kept together in thicker paper folders genus overs),

and finally they are incorporated into the herbarium cupboards in their proper position according to a well-known system of classification. In India Bentham and Hooker's system of classification is used for' his purpose. Type specimens are generally stored in separate and safe places.

1- Pressing & Drying

2- Identification

3- Mounting

4- Storage

Examples of the most popular collections in the world:

1. Royal Botanical Garden, Kew, England.
2. Gray Herbarium, Harvard Univ. U.S.A.
3. Collection of the National Museum, Washington, D.C. U.S.A.
4. New York Botanical Garden, U.S.A.
5. Missouri Botanical Garden U.S.A
6. Botanical Garden of The Academy of Science, Leningrad, USSR “Russia”.
7. Royal Botanical Garden, Calcuta, India

Examples of the most popular collections in Egypt:

- Cairo University Herbarium (CAI).
- Botany Dept. Herbarium, Aswan university (ASW).
- Botanical museum, Giza (CAIM).

FLORA OF SOUTH VALLEY UNIVERSITY

Plants names list

No.	Arabic Name	Plant form/uses	Scientific Name	Family Name
ACANTHACEAE				
1	الادهاتودا البيضاء	Shrub-ornamental	*Adhatoda vasica*	Acanthaceae
AMARANTHACEAE				
2	عرف الديك	Annual-ornamental	*Amaranthus viridis*	Amaranthaceae
3	عرف الديك		*Amaranthus lividus*	Amaranthaceae
ANACARDIACEAE				
4	المانجو	Tree- fruits	*Mangifera indica*	Anacardiaceae
APOCYNACEAE				
5	دفله	Shrub-ornamental	*Nerium oleander*	Apocynaceae
6	ونكا	Herb-perennial-ornamental	*Vinca rosa* (*Catharanthus roseus*)	Apocynaceae
7	تيفتيا	Shrub-ornamental	*Thevetia nereifolia*	Apocynaceae
ASCLEPIADACEAE				
8	ام العشار	Shrub-medicinal	*Calotropis procera*	Asclepiadaceae
9	شجرة الجبل (المرخ)	Shrub-medicinal	*Leptadenia pyrotechnica*	Asclepiadaceae
10	بيرجيولاريا او العتمة	Herb	*Pergularia tomentosa*	Asclepiadaceae
BIGNONIACEAE				
11	جاكرندا	Tree-ornamental	*Jacaranda acutifolia*	Bignoniaceae
12	تيكوما صفراء		*Tecoma stans*	Bignoniaceae
BOMBACACEAE				
13	بومباكس (الزغب الابيض)	Woody tree-ornamental	*Bombax malabaricum*	Bombacaceae
BALANITACEAE				
14	لالوب هجليج	Tree-medicinal-ornamental	*Balanites aegyptiaca*	Balanitaceae
CACTACEAE				
15	التين الشوكى (بأشواك)	Shrubs or trees- fruit-ornamental	*Opuntia ficus-indica*	Cactaceae
16	تين شوكى (خالى		*Opuntia inermis*	Cactaceae

	من الاشواك)			
CAESALPINIACEAE				
17	خف الجمل	Trees-ornamental	*Bauhinia variegata*	Caesalpiniaceae
18	خيار شمبر	trees-ornamental - medicinal	*Cassia fistula*	Caesalpiniaceae
19	السنا	trees-ornamental - medicinal	*Cassia tomentosa (= Senna multiglandulosa)*	Caesalpiniaceae
19	بوانسيانا	Trees - ornamental -	*Poinciana (Delonix) regia*	Caesalpiniaceae
20	تمر هندى	Woody trees-ornamental	*Tamarindus indica*	Caesalpiniaceae
CASUARINACEAE				
21	الكازورينا	Woody trees-ornamental	*Casuarina equisetifolia*	Casuarinaceae
CANNACEAE				
22	كنا حمراء	Herb – perennial-ornamental	*Canna indica*	Cannaceae
23	كنا صفراء		*Canna hybrida*	Cannaceae
CAPPARIDACEAE				
24	اللصف	Herb – perennial-medicinal	*Capparis spinosa*	Capparidaceae
CHENOPODIACEAE				
25	ابوعفين	Herb	*Chenopodium murale*	Chenopodiaceae
26	المنتنه	Herb	*Chenopodium album*	Chenopodiaceae
27	ركب الجمل	Herb	*Chenopodium ambrosioides*	Chenopodiaceae
28	سبانخ	Herb-vegetables	*Spinacia oleracea*	Chenopodiaceae
29	السلسولة	Shrub	*Salsola imbricata*	Chenopodiaceae
30	السلسولة	Shrub	*Salsola tetragona (suaeda)*	Chenopodiaceae
COMPOSITAE				
31		Herb	*Anthemis pseudocotula*	Compositae

32	بيدنس بيلوزا	Herb	*Bidens pilosa*	Compositae
33	الأقحوان	Herb – medicinal	*Calendula arvensis*	Compositae
34	القرطم	Herb- oil crop	*Carthamus tinctorius*	Compositae
35	شيكوريا	Herb	*Cichorium endivia*	Compositae
36	البرنوف	Perennial - herb	*Conyza dioscoridis*	Compositae
37	حشيش الجبل	Herb	*Conyza bonariensis*	Compositae
38	عباد الشمس	Annual (summer)- oil crops	*Helianthus annuus*	Compositae
39	خس بلدى	Herb	*Lactuca sativa*	Compositae
40	خس الحمار	Herb	*Lactuca serriola*	Compositae
41	لاونيا هامية	Herb	*Launaea mucronata*	Compositae
42	لاونيا طويله	Herb	*Launaea cassiniana*	Compositae
43	الكاموميل- شيح بابونج	Herb – medicinal	*Matricaria camomilla*	Compositae
44	شاى الجبل	Herb – medicinal	*Pulicaria crispa*	Compositae
45	شاى الجبل	Herb – medicinal	*Pulicaria undulata*	Compositae
46		Herb	*Reichardia tingitana*	Compositae
47	جعضيض	Herb – medicinal	*Sonchus oleraceus*	Compositae
48	القطيفه	Herb- ornamental	*Tagetes minuta*	Compositae
49	السليس	Herb	*Urospermum picroides*	Compositae
50	شبيط	Herb- perennial	*Xanthium strumarium*	Compositae
COMBRETACEAE				
51	ترمينااليا	Woody trees- ornamental	*Terminalia arjuna*	Combretaceae
52	كونوكاربس	Woody trees- ornamental	*Conocarpus erectus*	Combretaceae
CONVOLVULACEAE				
53	العليق	Herb	*Convolvulus arvensis*	Convolvulaceae
54	ست الحسن	Herb-	*Ipomoea pes-*	Convolvulaceae

	القلبيه (رجل الماعز)	perennial	*caprae*	
55	بطاطا	Herb-vegetables	*Ipomoea batatas*	Convolvulaceae
56	ست الحسن المشرحة	Herb-perennial	*Ipomoea tricolor*	Convolvulaceae
57	ست الحسن القلبيه	Climbing-ornamental	*Ipomoea palmate*	Convolvulaceae
CRUCIFERAE				
58	خردل ابيض	Herb-medicinal	*Morettia philaeana*	Cruciferae
59	الكرنب	Herb-vegetables	*Brassica oleraceae* var.*capitata*	Cruciferae
60	القرنبيط	Herb-vegetables	*Brassica oleraceae* var.*botrytis*	Cruciferae
61	اللفت	Herb-vegetables	*Brassica rapa*	Cruciferae
62	جرجير	Herb-vegetables	*Eruca sativa*	Cruciferae
63	الفجل	Herb-vegetables	*Raphanus sativus*	Cruciferae
64	الشويا	Herb	*Schouwia thebaica*	Cruciferae
65	فجل الجمل	Herb	*Sisymbrium irio*	Cruciferae
66	الزلة	Herb	*Zilla spinosa*	Cruciferae
CUCURBITACEAE				
67	الحنظل	Herb-medicinal	*Citrullus colocynthis*	Cucurbitaceae
68	البطيخ	Herb-vegetables	*Citrullus lanatus*	Cucurbitaceae
69	الخيار	Herb-vegetables	*Cucmuis sativus*	Cucurbitaceae
70	الكوسة	Herb-vegetables	*Cucurbita pepo*	Cucurbitaceae
71	اللوف	Climbing-medicinal	*Luffa cylindrica*	Cucurbitaceae
CUPRESSASEAE				
72	السرو	Woody tree-ornamental	*Cupressus sempervirens*	Cupressaseae
CUSCUTACEAE				
	الحامول	Herb-parasite	*Cuscuta arvensis*	Cuscutaceae
CYPERACEAE				

73	السعد	Herb-medicinal	*Cyperus rotundus*	Cyperaceae
74	حب العزيز	Herb	*Cyperus esculentus*	Cyperaceae
75	سمّار حلو	Herb	*Cyperus alopecuroides*	Cyperaceae
EUPHORBIACEAE				
76		Shrub-ornamental	*Acalypha wilkesania*	Euphorbiaceae
77	نبات الشربة	Herb-medicinal	*Euphorbia heterophylla*	Euphorbiaceae
78	ايفوربيا قلبية	Herb	*Euphorbia hirta*	Euphorbiaceae
79	الودينة	Herb	*Euphorbia peplus*	Euphorbiaceae
	ايفوربيا عديمة الاوراق	Herb	*Euphorbia aphylla*	Euphorbiaceae
80	بنت القنصل	Shrub-ornamental	*Euphorbia pulcherrima*	Euphorbiaceae
81		Herb	*Euphorbia helioscopia*	Euphorbiaceae
82	الخروع	Herb-perennial-medicinal-oil crop	*Ricinus communis*	Euphorbiaceae
GERANIACEAE				
83	جارونيا	Herb-perennial-ornamental	*Pelargonium zonale*	Geraniaceae
84	العتر	Herb-ornamental - fragrant	*Pelargonium graveolens*	Geraniaceae
GRAMINEAE				
85	هيش الجزر	Herb	*Phragmites australis*	Gramineae
86	غاب	Herb-helophyte (marshy)	*Arundo donax*	Gramineae
87	زمير	Herb	*Avena fatua*	Gramineae
88	زمير	Herb	*Avena barbata*	Gramineae
89	نجيل	Herb-perennial-soil covers	*Cynodon dactylon*	Gramineae
90	رجل الحربايا	Herb	*Dactyloctenium aegyptium*	Gramineae
91	حميرة	Herb	*Dichanthium*	Gramineae

			annulatum	
92	ابوركبه	Herb	*Echinochloa colona*	Gramineae
93		Herb	*Eragrostis ciliata*	Gramineae
94	شعير	Annual-medicinal-grains crop	*Hordeum vulgare*	Gramineae
95	حلفا ذيل القط	Herb	*Imperata cylindrica*	Gramineae
96	حشيشة الحصان	Herb	*Lolium perenne*	Gramineae
97		Herb	*Lolium temulentum*	Gramineae
98		Herb	*Panicum repens*	Gramineae
99	ذيل القط	Herb	*Polypogon monspeliensis*	Gramineae
100	قصب السكر	Herb-sugar crop	*Saccharum officinarum*	Gramineae
101		Herb	*Setaria pumila*	Gramineae
102		Herb	*Setaria viridis*	Gramineae
103	ذرة عويجه (رفيعه)	Herb-grains crop	*Sorghum bicolor*	Gramineae
104		Herb- feed crops	*Sorghum variegatum*	Gramineae
105	القمح	Herb - grains crop	*Triticum vulgaris*	Gramineae
106	ذره صفراء (شاميه)	Herb - grains crop	*Zea mays*	Gramineae
		Herb	*Digitaria ciliaris*	Gramineae
LABIATAE				
107	النعناع	Herbal-medicinal-fragrant	*Mentha spicata*	Labiatae
108	ريحان	Herbal-medicinal-fragrant	*Ocimum basilicum*	Labiatae
109	حصا لبان (روزمارى)	Herbal-medicinal	*Rosmarinus officinalis*	Labiatae
LATHYRACEAE				
110	الحنة	Herbal-medicinal-pigmenting	*Lawsania inermis*	Lathyraceae

LILIACEAE				
111	بصل	Herbal-medicinal-bulb	*Allium cepa*	Liliaceae
112	ثوم	Herbal-medicinal-bulb	*Allium sativa*	Liliaceae
113	كرات	Herbal-medicinal	*Allium kurrat*	Liliaceae
114	صبار	Herbal-medicinal-ornamental	*Aloe vera*	Liliaceae
MALVACEAE				
115	الخطمية	Herbal-medicinal-ornamental	*Althaea rosea*	Malvaceae
116	ابوتيلون	Herbal-medicinal-ornamental	*Abutilon bidentatum*	Malvaceae
117	قطن	Herbal- oil crop- fibers crop	*Gossypium barbadense*	Malvaceae
118	ورد الصين	Shrub-ornamental	*Hibiscus rosa-sinensis*	Malvaceae
119	كركديه	Herbal-medicinal-pigmenting	*Hibiscus sabdariffa*	Malvaceae
120	بامية	Herbal-vegetables	*Hibiscus esculentus*	Malvaceae
121	خبيزة	Herb	*Malva parviflora*	Malvaceae
122	ملوخية شيطانى	Herb	*Sida alba*	Malvaceae
MELIACEAE				
123	كايا سنغالى	Woody trees-ornamental	*Khaya senegalensis*	Meliaceae
124	نيم	Woody trees-medicinal	*Azadirachta indica*	Meliaceae
MIMOSACEAE				
125	السنط العربى	Woody trees-Arabic glue (tannins)	*Acacia nilotica*	Mimosaceae
126		Shrub	*Acacia maxylenon*	Mimosaceae

127	فتنه	Trees-ornamental - fragrant	*Acacia farnesiana*	Mimosaceae
128	اللبخ	Woody trees	*Albizzia lebbek*	Mimosaceae
129		Woody trees-ornamental	*Leucaena leucocephala*	Mimosaceae
130	ست المستحية	Shrub	*Mimosa pudica*	Mimosaceae
		Woody trees-ornamental	*Inga edulis*	
MORACEAE				
131	التين البرشومى	Fruit trees	*Ficus carica*	Moraceae
132	فيكس ذو ورقة عريضة	Trees-ornamental	*Ficus elastic (= F. decora)*	Moraceae
133	فيكس ذو ورقة حمراء	Trees-ornamental	*Ficus infectoria*	Moraceae
134	فيكس	Trees-ornamental	*Ficus nitida*	Moraceae
135	جميز	Woody trees- fruit	*Ficus sycomorus*	Moraceae
136	فيكس لسان لعصفور (صنف)	Woody trees-ornamental	*Ficus religiosa*	Moraceae
137	توت أبيض	Woody trees- fruit-silk producers	*Morus alba*	Moraceae
138	توت أسود	Woody trees-ornamental - fruit- silk producers	*Morus nigra*	Moraceae
MUSACEAE				
139	الموز	Fruit trees	*Musa nana*	Musaceae
MYRTACEAE				
140	فرشاة الزجاج	Shrub-ornamental	*Callistemon lanceolatus*	Myrtaceae
141	كافور	Woody trees-ornamental	*Eucalyptus camaldulensis*	Myrtaceae

142	الجوافة	Fruit trees	*Psidium guajava*	Myrtaceae
143	ياسمين زفر	Shrub-fence سياج	*Myrtus communies*	Myrtaceae
Nyctaginaceae				
144	الجهنمية	Shrub-climbing-ornamental	*Bougainvillae glabra*	Nyctaginaceae
OLEACEAE				
145	الزيتون	Fruit trees-oil crop	*Olea europaea*	Oleaceae
OROBANCHACEAE				
146	هالوك الفول	Herb-parasite	*Orobanche crenata*	Orobanchaceae
147	هالوك الباذنجان	Herb-parasite	*Orobanche ramosa*	Orobanchaceae
OXALIDACEAE				
148	حميض	Herbal	*Oxalis corniculata*	Oxalidaceae
PALMAE				
149	نخيل راحى الاوراق	Ornamental palm	*Washingtonia robusta*	Palmae
150	نخيل البلح	Date (fruit) bpalm	*Phoenix dactylifera*	Palmae
151	نخيل الدوم	Doum (fruit) palm	*Hyphaene thebaica*	Palmae
PAPILIONACEAE				
152	عاقول	Herbal-medicinal	*Alhagi maurorum*	Papilionaceae
153	فول سودانى	Herbal- oil crop	*Arachis hypogaea*	Papilionaceae
154		Herbal	*Astragillus sp.*	Papilionaceae
155	الحمص	Herbal-legumes	*Cicer arietinum*	Papilionaceae
156	السرسوع	Woody trees-ornamental	*Dalbergia sissoo*	Papilionaceae
157	بسلة الزهور	Herbal-plant breeding	*Lathyrus odoratus*	Papilionaceae
158	جلبان	Herbal-feed	*Lathyrus sativus*	Papilionaceae
159	اللوتس (رجل العصفور)	Herbal-medicinal	*Lotus arabicus*	Papilionaceae
16	الترمس	Herbal-	*Lupinus termis*	Papilionaceae

0		legumes		
161	ابو المكارم	Woody trees-ornamental	*Tipuana specicosa*	Papilionaceae
162	برسيم حجازى	Herbal-feed	*Medicago sativa*	Papilionaceae
163	الحندقوق	Herbal	*Melilotus indicus*	Papilionaceae
164	الفاصوليا	Herbal-legumes	*Phaseolus vulgaris*	Papilionaceae
165	البسلة	Herbal-legumes	*Pisum sativum*	Papilionaceae
166	السيسبان	Woody trees	*Sesbania sesban*	Papilionaceae
167	برسيم بلدى	Herbal-feed	*Trifolium alexandrinum*	Papilionaceae
168	Qort	Herbal	*Trifolium resupinatum*	Papilionaceae
169	الحلبة	Herbal-legumes-medicinal	*Trigonella foenum-graecum*	Papilionaceae
170	عشب الملك	Herbal	*Trigonella hamosa*	Papilionaceae
171	الفول	Herbal-legumes	*Vicia faba*	Papilionaceae
172	اللوبيا	Herbal-legumes	*Vigna sinensis*	Papilionaceae
PHYLLANTHACEAE				
173		Herbal-medicinal-fence	*Phyllanthus amarus*	Phyllanthaceae
PLANTAGINACEAE				
174	لسان الحمل	Herbal	*Plantago major*	Plantaginaceae
175		Herbal	*Plantago lagopus*	Plantaginaceae
POLYGONACEAE				
176	الحميض	Herbal-medicinal	*Emex spinosa*	Polygonaceae
177	ضرس العجوز	Herbal	*Rumex dentatus*	Polygonaceae
178		Herbal	*Rumex cyperius*	Polygonaceae
179		Herbal	*Rumex vesicarius*	Polygonaceae
180		Herbal	*Polygonum equisetiforme*	Polygonaceae

PORTULACACEAE				
181	رجلة	Herbal-medicinal	*Portulaca oleracea*	Portulacaceae
PRIMULACEAE				
182	عين القط	Herbal-medicinal	*Anagallis arvensis*	Primulaceae
PUNICACEAE				
183	الرمان	Fruit trees	*Punica granatum*	Punicaceae
RESEDACEAE				
184	العلندر-الجردي	Perennial herb	*Ochradenus baccatus*	Resedaceae
RHAMNACEAE				
185	النبق(السدر)	Woody trees-fruiting-medicinal	*Zizyphus spina-chiristi*	Rhamnaceae
ROSACEAE				
186	الفراولة	Herbal-fruiting	*Fragaria grandifolra*	Rosaceae
187	مشمش	Trees-fruiting	*Prunis armeniaca*	Rosaceae
188	برقوق	Trees-fruiting	*Prunis demostica*	Rosaceae
189	خوخ	Trees-fruiting	*Prunis persica*	Rosaceae
190	تفاح	Trees-fruiting	*Pyrus malus*	Rosaceae
191	الورد	Shrub-fragrant	*Rosa involucrate*	Rosaceae
RUTACEAE				
192	ليمون بلدى	Trees-fruiting	*Citrus aurantifolia*	Rutaceae
193	نارنج	Trees-fruiting	*Citrus aurantium*	Rutaceae
194	يوسفى	Trees-fruiting	*Citrus nobilis*	Rutaceae
195	برتقال	Trees-fruiting	*Citrus sinensis*	Rutaceae
SALICACEAE				
196	الصفصاف	Woody trees-medicinal	*Salix mucronata*	Salicaceae
SAPINDACEAE				
197	دودونيا	Shrub-ornamental	*Dodonaea viscosa*	Sapindaceae

		- fence		
SOLANACEAE				
198	الشطة	Herbal-medicinal	*Capsicum frutiscens*	Solanaceae
199	فلفل	Herbal-medicinal	*Capsicum annum*	Solanaceae
200	داتورا	Herbal-medicinal	*Datura stramonium*	Solanaceae
201	السكران	Herbal-medicinal	*Hyoscyamus muticus*	Solanaceae
202	البيتونيا	Annual herb-medicinal	*Petunia hybrida*	Solanaceae
203	طماطم	Herbal-vegetables	*Solanum lycopersicum*	Solanaceae
204	باذنجان	Herbal-vegetables	*Solanum melongena*	Solanaceae
205	عنب الديب	Herbal - medicinal	*Solanunm nigrum*	Solanaceae
206	بطاطس	Herbal-vegetables	*Solanum tuberosum*	Solanaceae
207	سم الفراخ	Herbal	*Withania somnifera*	Solanaceae
STERCULIACEAE				
208	بودرة العفريت	trees-ornamental	*Sterculia diversifolia*	
TAMARICACEAE				
209	*الاثل*	trees-ornamental	*Tamarix aphylla*	Tamaricaceae
210	*الاثل*	trees-ornamental	*Tamarix nilotica*	Tamaricaceae
TILIACEAE				
211	ملوخية	Herbal-vegetables	*Corchorus olitorius*	Tiliaceae
TROBAEOLACEAE				
212	ابوخنجر	Herbal - ornamental	*Tropaeolum majus*	Trobaeolaceae
UMBELLIFERAE				
213	خلة شيطانى	Herbal - medicinal	*Ammi majus*	Umbelliferae
214	الشبت	Herbal - medicinal	*Anethum graveolens*	Umbelliferae
215	كراوية	Herbal – medicinal-fragrant	*Carum carve*	Umbelliferae
216	كسبرة	Herbal - medicinal	*Coriandrum sativum*	Umbelliferae

217	كمون	Herbal – medicinal-fragrant	*Cuminum cyminum*	Umbelliferae
218	جزر	Herbal – vegetables	*Daucus carota*	Umbelliferae
219	شمر	Herbal – medicinal-fragrant	*Foeniculium vulgare*	Umbelliferae
220	بقدونس	Herbal – medicinal	*Petroselinum sativum*	Umbelliferae
221	ينسون	Herbal – medicinal-fragrant	*Pimpinella anisum*	Umbelliferae
VERBENACEAE				
222	دورنتا مبرقشة	Shrub-ornamental	*Duranta repens var.varigata*	Verbenaceae
223	دورنتا خضراء	Shrub-ornamental	*Duranta repens*	Verbenaceae
224	لانتانا كمارا	Shrub-fence	*Lantana camara*	Verbenaceae
225	الليبيا	Herbal-ornamental - soil covers	*Phyla nodiflora*	Verbenaceae
226		Herbal-ornamental	*Verbena bipinnatifida*	Verbenaceae
227	فربينا	Herbal-ornamental	*Verbena hybrida*	Verbenaceae
ZYGOPHYLLACEAE				
228	فاجونيا	Herbal – medicinal	*Fagonia arabica*	Zygophyllaceae
229	تريبولوس (القرينة)	Hispid (spiny) herb-medicinal	*Tribulus terestris*	Zygophyllaceae
230	رطريط مركب	Herbal – medicinal	*Zygophyllum coccinum*	Zygophyllaceae
231	رطريط بسيط	Herbal – medicinal	*Zygophyllum simplex*	Zygophyllaceae

Students' Notes

Practice approval sheet

Student name:

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Faculty/year: ……..

Section: ……..……..

Date	Lesson	Evaluation	Signature
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Evaluation proposal

Presence/absence	Laboratory notebook	Others
Practical degree	Semester Periodic degree	Oral degree

***Notice**

You must keep this proposal and introduce it in the practical test.

Signature

Course Prof.

Practical part

What is Flora?

Flora is all the plant life present in a particular region or time, generally the naturally occurring native plants. The corresponding term for animal life is **fauna**. Flora, fauna, and other forms of life, such as fungi, are collectively referred to as biota.

Flora is the name given to the collective plant life that grows or once grew in a certain area or during a given time period. It usually refers to the native plant life present but does include new species that have been introduced as well. The flora and fauna of the earth have names derived from Latin.

In the language, ‘Flora’ was a goddess of flowers and plants. In the Roman mythology, she was the goddess of fertility. And so, the plant kingdom came to be known as Flora. The study of the plant life around the world is very interesting since is makes different classifications of the flora.

Herbarium is defined as a collection of plants that usually have been dried, pressed, preserved on sheets and arranged according to any accepted system of classification for future reference and study.

A voucher herbarium specimen is a pressed plant sample deposited for future reference. It supports research work and may be examined to verify the identity of the specific plant used in a study. A voucher specimen must be deposited in a recognized herbarium committed to long-term maintenance.

Methods of preparation of herbarium specimens:

The preparation of an herbarium involves:

(i) Field visits,

(ii) Collection of specimens,

(iii) Drying,

(iv) Mounting on an herbarium sheet,

(v) Preservation,

(vi) Labelling and

(vii) Proper storage.

(a) Field visits and specimen collection:

A complete specimen possesses all parts including root system, flowers and fruits. Therefore, regular field visits are necessary to obtain information at every stage of

growth and reproduction of a plant species. In the fields, the tools required are mainly trowel (digger) for digging roots, scissors and knife for cutting twigs, a stick with a hook for collection of parts of tall trees, a field notebook, polythene bag, old newspaper and magazines.

To avoid damage during transportation and preservation at least 5- specimens of a plant should by collected. The collected specimens are transported in a vasculum (specimen box) to prevent willing, livery collected specimen must be tagged with a field number and necessary information should be recorded in a field notebook.

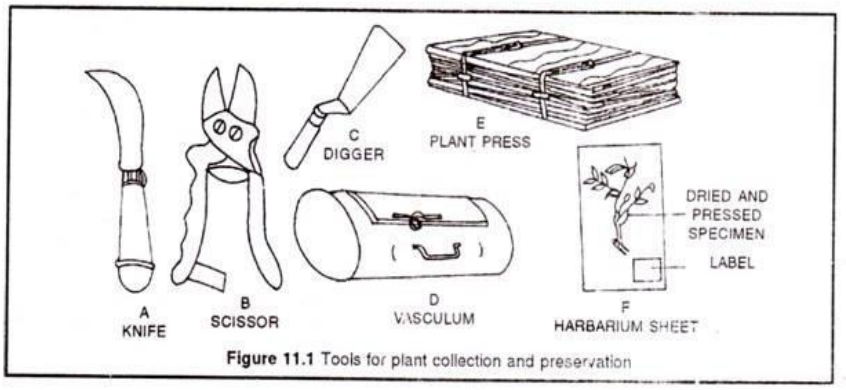

Figure 11.1 Tools for plant collection and preservation

(b) Pressing and drying:

The specimens are spread out between the folds of old newspapers or blotting sheets avoiding overlapping of parts. The larger specimen may' folded in 'N' or' W'

shapes. The blotting sheets with plant specimen should be placed in the plant press for drying. After 24 to 48 hrs. the press is opened.

(c) Mounting:

The dried specimens are mounted on herbarium sheets of standard size (41 x 29 cm). Mounting is done with die help of glue, adhesive or cello tape. The bulky plant parts like dry fruits seeds, cones etc. are dried without pressing and are put in small envelops called fragment packets. Succulent plants are not mounted on herbarium sheets but are collected in 4% formalin or FAA (Formalin Acetic Alcohol).

(f) Preservation:

The mounted specimens are sprayed with fungicides like 2% solution of mercuric chloride.

(e) Labelling:

A plant specimen is incomplete without label data. Label data is a form of field data and must be accurate. The following are important elements:

- **Scientific name**: genus, species, authority, infraspecific information

- **Determiner of the scientific name**: the name of the person who identified the plant
- **Detailed location**: the location is used by researchers on several levels:
    - for general mapping to region, county or province.
    - for detailed mapping, as in GIS computer applications.
    - to physically locate the plant(s) in order to obtain further research material. The location should consist of country, state or province, county or municipality and a description of the location in reference to roads, road junctions, mile markers and distances from cities and/or towns. Latitude and longitude, section, township and range, and elevation may also be helpful. A location taken with a Global Positioning System (GPS) is a desirable complement to the locality description. GPS coordinates MUST include a datum!

- **Habitat**: the type of plant community where the plant is growing and, if known, other plants growing in association
- **Plant habit**: describes the form of the plant (tree, shrub, vine, herb) and its height. Examples: tree, ca. 50 ft. tall. sprawling herb
- **Frequency**: is the plant rare, occasional, frequent or common?
- **Plant description**: describe characteristics of the plant which may be lost upon drying, such as flower/fruit color and fragrance, leaf orientation and aroma
- **Collector name**: it is recommended that the collector be consistent and use their full first name, middle initial (or full name) and full last name.

- **Collection number**: a sequential straightforward numbering system (1,2, 3, ...) is preferable.

South Valley University Herbarium **Faculty of Science at Qena**
Scientific name : **Common name :** **Family Name :** **Locality :** **Date of collection :** **Leg. :** **Det. :**

- **Date of collection**: a format with the month spelled out or abbreviated and 4-digit year will prevent confusion. e.g., 3 May 2003, not 3/5/03 or 5/3/03.

(f) Storage:

Properly dried, pressed and identified plant specimens are placed in thin paper folds (specimen covers) which are kept together in thicker paper folders genus overs),

and finally they are incorporated into the herbarium cupboards in their proper position according to a well-known system of classification. In India Bentham and Hooker's system of classification is used for' his purpose. Type specimens are generally stored in separate and safe places.

1- Pressing & Drying

2- Identification

3- Mounting

4- Storage

Examples of the most popular collections in the world:

1. Royal Botanical Garden, Kew, England.
2. Gray Herbarium, Harvard Univ. U.S.A.
3. Collection of the National Museum, Washington, D.C. U.S.A.
4. New York Botanical Garden, U.S.A.
5. Missouri Botanical Garden U.S.A
6. Botanical Garden of The Academy of Science, Leningrad, USSR “Russia”.
7. Royal Botanical Garden, Calcuta, India

Examples of the most popular collections in Egypt:

- Cairo University Herbarium (CAI).
- Botany Dept. Herbarium, Aswan university (ASW).
- Botanical museum, Giza (CAIM).

FLORA OF SOUTH VALLEY UNIVERSITY

Plants names list

No.	Arabic Name	Plant form/uses	Scientific Name	Family Name
ACANTHACEAE				
1	الادهاتودا البيضاء	Shrub-ornamental	*Adhatoda vasica*	Acanthaceae
AMARANTHACEAE				
2	عرف الديك	Annual-ornamental	*Amaranthus viridis*	Amaranthaceae
3	عرف الديك		*Amaranthus lividus*	Amaranthaceae
ANACARDIACEAE				
4	المانجو	Tree- fruits	*Mangifera indica*	Anacardiaceae
APOCYNACEAE				
5	دفله	Shrub-ornamental	*Nerium oleander*	Apocynaceae
6	ونكا	Herb-perennial-ornamental	*Vinca rosa* (*Catharanthus roseus*)	Apocynaceae
7	تيفتيا	Shrub-ornamental	*Thevetia nereifolia*	Apocynaceae
ASCLEPIADACEAE				
8	ام العشار	Shrub-medicinal	*Calotropis procera*	Asclepiadaceae
9	شجرة الجبل (المرخ)	Shrub-medicinal	*Leptadenia pyrotechnica*	Asclepiadaceae
10	بيرجيولاريا او العتمة	Herb	*Pergularia tomentosa*	Asclepiadaceae
BIGNONIACEAE				
11	جاكرندا	Tree-ornamental	*Jacaranda acutifolia*	Bignoniaceae
12	تيكوما صفراء		*Tecoma stans*	Bignoniaceae
BOMBACACEAE				
13	بومباكس (الزغب الابيض)	Woody tree-ornamental	*Bombax malabaricum*	Bombacaceae
BALANITACEAE				
14	لالوب هجليج	Tree-medicinal-ornamental	*Balanites aegyptiaca*	Balanitaceae
CACTACEAE				
15	التين الشوكى (بأشواك)	Shrubs or trees- fruit-ornamental	*Opuntia ficus-indica*	Cactaceae
16	تين شوكى (خالى		*Opuntia inermis*	Cactaceae

	من الاشواك)			
CAESALPINIACEAE				
17	خف الجمل	Trees-ornamental	*Bauhinia variegata*	Caesalpiniaceae
18	خيار شمبر	trees-ornamental - medicinal	*Cassia fistula*	Caesalpiniaceae
19	السنا	trees-ornamental - medicinal	*Cassia tomentosa (= Senna multiglandulosa)*	Caesalpiniaceae
19	بوانسيانا	Trees - ornamental -	*Poinciana (Delonix) regia*	Caesalpiniaceae
20	تمر هندى	Woody trees-ornamental	*Tamarindus indica*	Caesalpiniaceae
CASUARINACEAE				
21	الكازورينا	Woody trees-ornamental	*Casuarina equisetifolia*	Casuarinaceae
CANNACEAE				
22	كنا حمراء	Herb – perennial-ornamental	*Canna indica*	Cannaceae
23	كنا صفراء		*Canna hybrida*	Cannaceae
CAPPARIDACEAE				
24	اللصف	Herb – perennial-medicinal	*Capparis spinosa*	Capparidaceae
CHENOPODIACEAE				
25	ابوعفين	Herb	*Chenopodium murale*	Chenopodiaceae
26	المنتنه	Herb	*Chenopodium album*	Chenopodiaceae
27	ركب الجمل	Herb	*Chenopodium ambrosioides*	Chenopodiaceae
28	سبانخ	Herb-vegetables	*Spinacia oleracea*	Chenopodiaceae
29	السلسولة	Shrub	*Salsola imbricata*	Chenopodiaceae
30	السلسولة	Shrub	*Salsola tetragona (suaeda)*	Chenopodiaceae
COMPOSITAE				
31		Herb	*Anthemis pseudocotula*	Compositae

32	بيدنس بيلوزا	Herb	*Bidens pilosa*	Compositae
33	الأقحوان	Herb – medicinal	*Calendula arvensis*	Compositae
34	القرطم	Herb- oil crop	*Carthamus tinctorius*	Compositae
35	شيكوريا	Herb	*Cichorium endivia*	Compositae
36	البرنوف	Perennial - herb	*Conyza dioscoridis*	Compositae
37	حشيش الجبل	Herb	*Conyza bonariensis*	Compositae
38	عباد الشمس	Annual (summer)- oil crops	*Helianthus annuus*	Compositae
39	خس بلدى	Herb	*Lactuca sativa*	Compositae
40	خس الحمار	Herb	*Lactuca serriola*	Compositae
41	لاونيا هامية	Herb	*Launaea mucronata*	Compositae
42	لاونيا طويله	Herb	*Launaea cassiniana*	Compositae
43	الكاموميل- شيح بابونج	Herb – medicinal	*Matricaria camomilla*	Compositae
44	شاى الجبل	Herb – medicinal	*Pulicaria crispa*	Compositae
45	شاى الجبل	Herb – medicinal	*Pulicaria undulata*	Compositae
46		Herb	*Reichardia tingitana*	Compositae
47	جعضيض	Herb – medicinal	*Sonchus oleraceus*	Compositae
48	القطيفه	Herb- ornamental	*Tagetes minuta*	Compositae
49	السليس	Herb	*Urospermum picroides*	Compositae
50	شبيط	Herb- perennial	*Xanthium strumarium*	Compositae
COMBRETACEAE				
51	ترمينااليا	Woody trees- ornamental	*Terminalia arjuna*	Combretaceae
52	كونوكاربس	Woody trees- ornamental	*Conocarpus erectus*	Combretaceae
CONVOLVULACEAE				
53	العليق	Herb	*Convolvulus arvensis*	Convolvulaceae
54	ست الحسن	Herb-	*Ipomoea pes-*	Convolvulaceae

	القلبيه (رجل الماعز)	perennial	*caprae*	
55	بطاطا	Herb-vegetables	*Ipomoea batatas*	Convolvulaceae
56	ست الحسن المشرحة	Herb-perennial	*Ipomoea tricolor*	Convolvulaceae
57	ست الحسن القلبيه	Climbing-ornamental	*Ipomoea palmate*	Convolvulaceae
CRUCIFERAE				
58	خردل ابيض	Herb-medicinal	*Morettia philaeana*	Cruciferae
59	الكرنب	Herb-vegetables	*Brassica oleraceae* var.*capitata*	Cruciferae
60	القرنبيط	Herb-vegetables	*Brassica oleraceae* var.*botrytis*	Cruciferae
61	اللفت	Herb-vegetables	*Brassica rapa*	Cruciferae
62	جرجير	Herb-vegetables	*Eruca sativa*	Cruciferae
63	الفجل	Herb-vegetables	*Raphanus sativus*	Cruciferae
64	الشويا	Herb	*Schouwia thebaica*	Cruciferae
65	فجل الجمل	Herb	*Sisymbrium irio*	Cruciferae
66	الزلة	Herb	*Zilla spinosa*	Cruciferae
CUCURBITACEAE				
67	الحنظل	Herb-medicinal	*Citrullus colocynthis*	Cucurbitaceae
68	البطيخ	Herb-vegetables	*Citrullus lanatus*	Cucurbitaceae
69	الخيار	Herb-vegetables	*Cucmuis sativus*	Cucurbitaceae
70	الكوسة	Herb-vegetables	*Cucurbita pepo*	Cucurbitaceae
71	اللوف	Climbing-medicinal	*Luffa cylindrica*	Cucurbitaceae
CUPRESSASEAE				
72	السرو	Woody tree-ornamental	*Cupressus sempervirens*	Cupressaseae
CUSCUTACEAE				
	الحامول	Herb-parasite	*Cuscuta arvensis*	Cuscutaceae
CYPERACEAE				

73	السعد	Herb-medicinal	*Cyperus rotundus*	Cyperaceae
74	حب العزيز	Herb	*Cyperus esculentus*	Cyperaceae
75	سمّار حلو	Herb	*Cyperus alopecuroides*	Cyperaceae
EUPHORBIACEAE				
76		Shrub-ornamental	*Acalypha wilkesania*	Euphorbiaceae
77	نبات الشربة	Herb-medicinal	*Euphorbia heterophylla*	Euphorbiaceae
78	ايفوربيا قلبية	Herb	*Euphorbia hirta*	Euphorbiaceae
79	الودينة	Herb	*Euphorbia peplus*	Euphorbiaceae
	ايفوربيا عديمة الاوراق	Herb	*Euphorbia aphylla*	Euphorbiaceae
80	بنت القنصل	Shrub-ornamental	*Euphorbia pulcherrima*	Euphorbiaceae
81		Herb	*Euphorbia helioscopia*	Euphorbiaceae
82	الخروع	Herb-perennial-medicinal-oil crop	*Ricinus communis*	Euphorbiaceae
GERANIACEAE				
83	جارونيا	Herb-perennial-ornamental	*Pelargonium zonale*	Geraniaceae
84	العتر	Herb-ornamental - fragrant	*Pelargonium graveolens*	Geraniaceae
GRAMINEAE				
85	هيش الجزر	Herb	*Phragmites australis*	Gramineae
86	غاب	Herb-helophyte (marshy)	*Arundo donax*	Gramineae
87	زمير	Herb	*Avena fatua*	Gramineae
88	زمير	Herb	*Avena barbata*	Gramineae
89	نجيل	Herb-perennial-soil covers	*Cynodon dactylon*	Gramineae
90	رجل الحربايا	Herb	*Dactyloctenium aegyptium*	Gramineae
91	حميرة	Herb	*Dichanthium*	Gramineae

			annulatum	
92	ابوركبه	Herb	*Echinochloa colona*	Gramineae
93		Herb	*Eragrostis ciliata*	Gramineae
94	شعير	Annual-medicinal-grains crop	*Hordeum vulgare*	Gramineae
95	حلفا ذيل القط	Herb	*Imperata cylindrica*	Gramineae
96	حشيشة الحصان	Herb	*Lolium perenne*	Gramineae
97		Herb	*Lolium temulentum*	Gramineae
98		Herb	*Panicum repens*	Gramineae
99	ذيل القط	Herb	*Polypogon monspeliensis*	Gramineae
100	قصب السكر	Herb-sugar crop	*Saccharum officinarum*	Gramineae
101		Herb	*Setaria pumila*	Gramineae
102		Herb	*Setaria viridis*	Gramineae
103	ذرة عويجه (رفيعه)	Herb-grains crop	*Sorghum bicolor*	Gramineae
104		Herb- feed crops	*Sorghum variegatum*	Gramineae
105	القمح	Herb - grains crop	*Triticum vulgaris*	Gramineae
106	ذره صفراء (شاميه)	Herb - grains crop	*Zea mays*	Gramineae
		Herb	*Digitaria ciliaris*	Gramineae
LABIATAE				
107	النعناع	Herbal-medicinal-fragrant	*Mentha spicata*	Labiatae
108	ريحان	Herbal-medicinal-fragrant	*Ocimum basilicum*	Labiatae
109	حصا لبان (روزمارى)	Herbal-medicinal	*Rosmarinus officinalis*	Labiatae
LATHYRACEAE				
110	الحنة	Herbal-medicinal-pigmenting	*Lawsania inermis*	Lathyraceae

LILIACEAE				
111	بصل	Herbal-medicinal-bulb	*Allium cepa*	Liliaceae
112	ثوم	Herbal-medicinal-bulb	*Allium sativa*	Liliaceae
113	كرات	Herbal-medicinal	*Allium kurrat*	Liliaceae
114	صبار	Herbal-medicinal-ornamental	*Aloe vera*	Liliaceae
MALVACEAE				
115	الخطمية	Herbal-medicinal-ornamental	*Althaea rosea*	Malvaceae
116	ابوتيلون	Herbal-medicinal-ornamental	*Abutilon bidentatum*	Malvaceae
117	قطن	Herbal- oil crop- fibers crop	*Gossypium barbadense*	Malvaceae
118	ورد الصين	Shrub-ornamental	*Hibiscus rosa-sinensis*	Malvaceae
119	كركديه	Herbal-medicinal-pigmenting	*Hibiscus sabdariffa*	Malvaceae
120	بامية	Herbal-vegetables	*Hibiscus esculentus*	Malvaceae
121	خبيزة	Herb	*Malva parviflora*	Malvaceae
122	ملوخية شيطانى	Herb	*Sida alba*	Malvaceae
MELIACEAE				
123	كايا سنغالى	Woody trees-ornamental	*Khaya senegalensis*	Meliaceae
124	نيم	Woody trees-medicinal	*Azadirachta indica*	Meliaceae
MIMOSACEAE				
125	السنط العربى	Woody trees-Arabic glue (tannins)	*Acacia nilotica*	Mimosaceae
126		Shrub	*Acacia maxylenon*	Mimosaceae

127	فتنه	Trees-ornamental - fragrant	*Acacia farnesiana*	Mimosaceae
128	اللبخ	Woody trees	*Albizzia lebbek*	Mimosaceae
129		Woody trees-ornamental	*Leucaena leucocephala*	Mimosaceae
130	ست المستحية	Shrub	*Mimosa pudica*	Mimosaceae
		Woody trees-ornamental	*Inga edulis*	
MORACEAE				
131	التين البرشومى	Fruit trees	*Ficus carica*	Moraceae
132	فيكس ذو ورقة عريضة	Trees-ornamental	*Ficus elastic (= F. decora)*	Moraceae
133	فيكس ذو ورقة حمراء	Trees-ornamental	*Ficus infectoria*	Moraceae
134	فيكس	Trees-ornamental	*Ficus nitida*	Moraceae
135	جميز	Woody trees- fruit	*Ficus sycomorus*	Moraceae
136	فيكس لسان لعصفور (صنف)	Woody trees-ornamental	*Ficus religiosa*	Moraceae
137	توت أبيض	Woody trees- fruit-silk producers	*Morus alba*	Moraceae
138	توت أسود	Woody trees-ornamental - fruit- silk producers	*Morus nigra*	Moraceae
MUSACEAE				
139	الموز	Fruit trees	*Musa nana*	Musaceae
MYRTACEAE				
140	فرشاة الزجاج	Shrub-ornamental	*Callistemon lanceolatus*	Myrtaceae
141	كافور	Woody trees-ornamental	*Eucalyptus camaldulensis*	Myrtaceae

142	الجوافة	Fruit trees	*Psidium guajava*	Myrtaceae
143	ياسمين زفر	Shrub-fence سياج	*Myrtus communies*	Myrtaceae
Nyctaginaceae				
144	الجهنمية	Shrub-climbing-ornamental	*Bougainvillae glabra*	Nyctaginaceae
OLEACEAE				
145	الزيتون	Fruit trees-oil crop	*Olea europaea*	Oleaceae
OROBANCHACEAE				
146	هالوك الفول	Herb-parasite	*Orobanche crenata*	Orobanchaceae
147	هالوك الباذنجان	Herb-parasite	*Orobanche ramosa*	Orobanchaceae
OXALIDACEAE				
148	حميض	Herbal	*Oxalis corniculata*	Oxalidaceae
PALMAE				
149	نخيل راحى الاوراق	Ornamental palm	*Washingtonia robusta*	Palmae
150	نخيل البلح	Date (fruit) bpalm	*Phoenix dactylifera*	Palmae
151	نخيل الدوم	Doum (fruit) palm	*Hyphaene thebaica*	Palmae
PAPILIONACEAE				
152	عاقول	Herbal-medicinal	*Alhagi maurorum*	Papilionaceae
153	فول سودانى	Herbal- oil crop	*Arachis hypogaea*	Papilionaceae
154		Herbal	*Astragillus sp.*	Papilionaceae
155	الحمص	Herbal-legumes	*Cicer arietinum*	Papilionaceae
156	السرسوع	Woody trees-ornamental	*Dalbergia sissoo*	Papilionaceae
157	بسلة الزهور	Herbal-plant breeding	*Lathyrus odoratus*	Papilionaceae
158	جلبان	Herbal-feed	*Lathyrus sativus*	Papilionaceae
159	اللوتس (رجل العصفور)	Herbal-medicinal	*Lotus arabicus*	Papilionaceae
16	الترمس	Herbal-	*Lupinus termis*	Papilionaceae

0		legumes		
161	ابو المكارم	Woody trees-ornamental	*Tipuana specicosa*	Papilionaceae
162	برسيم حجازى	Herbal-feed	*Medicago sativa*	Papilionaceae
163	الحندقوق	Herbal	*Melilotus indicus*	Papilionaceae
164	الفاصوليا	Herbal-legumes	*Phaseolus vulgaris*	Papilionaceae
165	البسلة	Herbal-legumes	*Pisum sativum*	Papilionaceae
166	السيسبان	Woody trees	*Sesbania sesban*	Papilionaceae
167	برسيم بلدى	Herbal-feed	*Trifolium alexandrinum*	Papilionaceae
168	Qort	Herbal	*Trifolium resupinatum*	Papilionaceae
169	الحلبة	Herbal-legumes-medicinal	*Trigonella foenum-graecum*	Papilionaceae
170	عشب الملك	Herbal	*Trigonella hamosa*	Papilionaceae
171	الفول	Herbal-legumes	*Vicia faba*	Papilionaceae
172	اللوبيا	Herbal-legumes	*Vigna sinensis*	Papilionaceae
PHYLLANTHACEAE				
173		Herbal-medicinal-fence	*Phyllanthus amarus*	Phyllanthaceae
PLANTAGINACEAE				
174	لسان الحمل	Herbal	*Plantago major*	Plantaginaceae
175		Herbal	*Plantago lagopus*	Plantaginaceae
POLYGONACEAE				
176	الحميض	Herbal-medicinal	*Emex spinosa*	Polygonaceae
177	ضرس العجوز	Herbal	*Rumex dentatus*	Polygonaceae
178		Herbal	*Rumex cyperius*	Polygonaceae
179		Herbal	*Rumex vesicarius*	Polygonaceae
180		Herbal	*Polygonum equisetiforme*	Polygonaceae

PORTULACACEAE				
181	رجلة	Herbal-medicinal	*Portulaca oleracea*	Portulacaceae
PRIMULACEAE				
182	عين القط	Herbal-medicinal	*Anagallis arvensis*	Primulaceae
PUNICACEAE				
183	الرمان	Fruit trees	*Punica granatum*	Punicaceae
RESEDACEAE				
184	العلندر-الجردي	Perennial herb	*Ochradenus baccatus*	Resedaceae
RHAMNACEAE				
185	النبق(السدر)	Woody trees-fruiting-medicinal	*Zizyphus spina-chiristi*	Rhamnaceae
ROSACEAE				
186	الفراولة	Herbal-fruiting	*Fragaria grandifolra*	Rosaceae
187	مشمش	Trees-fruiting	*Prunis armeniaca*	Rosaceae
188	برقوق	Trees-fruiting	*Prunis demostica*	Rosaceae
189	خوخ	Trees-fruiting	*Prunis persica*	Rosaceae
190	تفاح	Trees-fruiting	*Pyrus malus*	Rosaceae
191	الورد	Shrub-fragrant	*Rosa involucrate*	Rosaceae
RUTACEAE				
192	ليمون بلدى	Trees-fruiting	*Citrus aurantifolia*	Rutaceae
193	نارنج	Trees-fruiting	*Citrus aurantium*	Rutaceae
194	يوسفى	Trees-fruiting	*Citrus nobilis*	Rutaceae
195	برتقال	Trees-fruiting	*Citrus sinensis*	Rutaceae
SALICACEAE				
196	الصفصاف	Woody trees-medicinal	*Salix mucronata*	Salicaceae
SAPINDACEAE				
197	دودونيا	Shrub-ornamental	*Dodonaea viscosa*	Sapindaceae

		- fence		
SOLANACEAE				
198	الشطة	Herbal-medicinal	*Capsicum frutiscens*	Solanaceae
199	فلفل	Herbal-medicinal	*Capsicum annum*	Solanaceae
200	داتورا	Herbal-medicinal	*Datura stramonium*	Solanaceae
201	السكران	Herbal-medicinal	*Hyoscyamus muticus*	Solanaceae
202	البيتونيا	Annual herb-medicinal	*Petunia hybrida*	Solanaceae
203	طماطم	Herbal-vegetables	*Solanum lycopersicum*	Solanaceae
204	باذنجان	Herbal-vegetables	*Solanum melongena*	Solanaceae
205	عنب الديب	Herbal - medicinal	*Solanunm nigrum*	Solanaceae
206	بطاطس	Herbal-vegetables	*Solanum tuberosum*	Solanaceae
207	سم الفراخ	Herbal	*Withania somnifera*	Solanaceae
STERCULIACEAE				
208	بودرة العفريت	trees-ornamental	*Sterculia diversifolia*	
TAMARICACEAE				
209	*الاثل*	trees-ornamental	*Tamarix aphylla*	Tamaricaceae
210	*الاثل*	trees-ornamental	*Tamarix nilotica*	Tamaricaceae
TILIACEAE				
211	ملوخية	Herbal-vegetables	*Corchorus olitorius*	Tiliaceae
TROBAEOLACEAE				
212	ابوخنجر	Herbal - ornamental	*Tropaeolum majus*	Trobaeolaceae
UMBELLIFERAE				
213	خلة شيطانى	Herbal - medicinal	*Ammi majus*	Umbelliferae
214	الشبت	Herbal - medicinal	*Anethum graveolens*	Umbelliferae
215	كراوية	Herbal – medicinal-fragrant	*Carum carve*	Umbelliferae
216	كسبرة	Herbal - medicinal	*Coriandrum sativum*	Umbelliferae

217	كمون	Herbal – medicinal-fragrant	*Cuminum cyminum*	Umbelliferae
218	جزر	Herbal – vegetables	*Daucus carota*	Umbelliferae
219	شمر	Herbal – medicinal-fragrant	*Foeniculium vulgare*	Umbelliferae
220	بقدونس	Herbal – medicinal	*Petroselinum sativum*	Umbelliferae
221	ينسون	Herbal – medicinal-fragrant	*Pimpinella anisum*	Umbelliferae
VERBENACEAE				
222	دورنتا مبرقشة	Shrub-ornamental	*Duranta repens var.varigata*	Verbenaceae
223	دورنتا خضراء	Shrub-ornamental	*Duranta repens*	Verbenaceae
224	لانتانا كمارا	Shrub-fence	*Lantana camara*	Verbenaceae
225	الليبيا	Herbal-ornamental - soil covers	*Phyla nodiflora*	Verbenaceae
226		Herbal-ornamental	*Verbena bipinnatifida*	Verbenaceae
227	فربينا	Herbal-ornamental	*Verbena hybrida*	Verbenaceae
ZYGOPHYLLACEAE				
228	فاجونيا	Herbal – medicinal	*Fagonia arabica*	Zygophyllaceae
229	تريبولوس (القرينة)	Hispid (spiny) herb-medicinal	*Tribulus terestris*	Zygophyllaceae
230	رطريط مركب	Herbal – medicinal	*Zygophyllum coccinum*	Zygophyllaceae
231	رطريط بسيط	Herbal – medicinal	*Zygophyllum simplex*	Zygophyllaceae

Students' Notes

Practice approval sheet

Student name:

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Faculty/year: ……..

Section: ……..……..

Date	Lesson	Evaluation	Signature
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Evaluation proposal

Presence/absence	Laboratory notebook	Others
Practical degree	Semester Periodic degree	Oral degree

***Notice**

You must keep this proposal and introduce it in the practical test.

Signature

Course Prof.