

## Lab 4 Collection

### Time

Therapeutic efficacy varies during different times or seasons of the year. The constituent and active principles vary quantitatively at different seasons of the year and the majority of plant materials are usually best collected during the dry season, when the herbs are at peak maturity and concentration.

Dry as quickly as possible, away from bright sunlight, to preserve the ingredients and prevent oxidation.

**Roots and rhizomes:** Best collected October to February, when the plants are more vigorously storing food in their underground organs.

**Leaves:** The most appropriate time is when the plant is about to bloom.

**Flowers:** Buds are preferred, best collected in the morning after the morning dew has evaporated; flowers, just before or shortly after opening. Dry the herbal materials as quickly as possible.

**Bark materials and stems:** Generally, best gathered in summer time. When the climate is warm and humid, the bark of any plant usually contains richer nutritive substances including the medicinal metabolites.

**Fruits and seeds:** Fully ripened fruits and mature seeds are preferred. Collection of pod fruits is done in the morning to avoid unnecessary opening up of the fruit wall to the detriment of losing the seeds. Turn the fleshy fruit frequently for even drying.

**Whole plant:** When the whole plant is desired, it is advisable to harvest the plant at the time when the flowers are all in bloom. Old and withering plants are less effective when used as a source of drugs.

### Habitat

Information about the location of the plants, especially the rare ones, can ease the search for them. It saves both time and energy.

Low altitudes probably range from sea level to about 300 meters; medium altitudes from about 310 meters to about 1000 meters; and high altitude from about 1000 meters and up.

### Storage

Many medicinal plants are seasonal, some not easily accessible, available only in deep forests or mountain peaks. Such restrictions require ways and devices to store them for future use. Dirt and other foreign substances should be removed. If washing is needed, it should be done quickly to minimize deterioration and loss of active substances. As a rule, all parts of the plant collected should be dried as soon as possible to avoid unnecessary waste of the drug materials through natural processes of denaturation, decay and fungal attacks.

## **Drying**

### **Methods of drying medicinal plants and aromatic**

This process means to reduce the moisture level in plants in order to save them and eliminate the causes of the damage done in two ways either by natural means or industrial means without damaging the effective proportion. The moisture in the flowers after drying 3-4% in dried leaves 4-6 % in the fruits 6-8 % and in the seeds 6-12 %.

The purpose of drying maintaining active substances during storage without being affected by weather factors and storage as a result of enzymatic activity in plant tissue or exposed to injury by insects and fungi in case there is a high percentage of humidity.

Some aromatic plants are extracted directly after harvest (such as Roses, Jasmine, Mint for the following reasons

- 1.The loss of some materials when drying.
- 2.Thermal drying leads to change images of active substances.
- 3.The large size of the plant material.
- 4.Provides extraction factories within farms.

### **Natural drying**

Natural drying, which is using the natural factors like sun and air, and in this way plants exposed to direct sunlight to be dried. The individual leaves and flowers after harvest shortest possible time in the shade place heat of the sun and renewed its air constantly where the individuality of flowers over sheets of paper or sheets clean layers of very thin and move from time to time until it is dry

Pot of wood attached on each other to remain on the distance between each tray and the other from 20-25 cm base and be made of Chinese fabric and wide pores so that punctuated the air from all edges.

### **Types of natural drying**

**Drying in the shade:** Drying shade away from light until it is completely drying, and can thus be maintained as natural as in rows of leaves of Datura and Mint and maintains radial rows of white flowers as in chamomile.

Exposure to the sun a short time and then drying shade.

**Drying in the sun:** This operation for plants that are not affected by the active components or changing their appearance direct sunlight, such as bitter melon fruits and ginger.

\* In all cases the drying will done on piece of wood or chain cloth or ventilated places in thin layers with continuous stirring while avoiding humidity, wind, insects and animals.

\* In general: the plants that contain essential oils lose the amount of oil when exposed to sunlight.

\* The natural drying period ranging between (1-3) weeks.

### **Reasons of shade drying**

- Retain green leaves as natural as in Datura and drunken.
- Keep in white flowers for chamomile.
- Keep the content of volatile oil.

### **Disadvantages natural drying method**

1. Lack of a temperature-controlled drying or vary such a degree depending on the time of year and different time of the day.
2. Lack of control factors in a possible natural air humidity, wind and rain.
3. The degree of cleanliness yield lower than in industrial drying process.
5. You need natural drying process for several days until it is finally drying but this method costs a few.

Industrial drying

Is the best way to get rid of the moisture content of plants quickly after harvest runs down to the temperature for a limited period is sufficient.

### **Features quick-drying**

1. Maintain retain effective without loss or decomposition or transformation.
2. Maintain the natural color of the drug.

Factors that depend upon temperature and the duration of the drying

1. Property Type (papers- roots- flowers- fruits).
2. Humidity allowed.
3. Property Specifications in terms of color and textures.

### **Methods of industrial drying**

- The use of direct fire: Old way put plants on fire.
- The use of heated stones: An ancient way of drying tobacco leaves.
- Use of furnaces: Ancient way followed by exposure to combustion and smoke out.
- Drying rooms: The most important and most commonly used in the control of temperature and duration of the drying.
- Oven: 70 C° for 24 hours  
55 C° for 48 hours  
40 C° for 72 hours

Changes associated with the drying process

- 1.Smell and Taste: gaining some unfavorable Smell and Taste some of medicinal plants after drying
- 2.Color: Turning green color to dark brown due to the decomposition of chlorophyll or antioxidant tannins in henna, mint and basil.
- 3.Ingredients: Loss proportion of volatile oils and their components.
- 4.Appearance or exterior: Wrinkle Securities and curvature of the blades and petioles

**Other special Methods**

Succulent materials are usually washed first in boiling water or steam-cooked in a container before actually drying it. For spiny and hairy materials, remove the unwanted appendages.

Some plant materials (ex. succulent materials) may require cutting or sectioning before drying.

In general, the moisture content of the dried plant materials should be less than 10% before storage.

Moisture content higher than 10% usually leads to growth of microorganisms and pest infestation with consequent drug deterioration.

\*The dried plant materials should be placed in plastic containers or tightly covered bottles; brown colored bottles are preferred as they minimize deterioration due to sunlight.

Dry charcoal (separated from the medicinal plant) may be placed inside the bottles to absorb moisture.

The storage place should be dry, well-ventilated, and spacious, lest fungi and insects may invade rampantly. Drug materials (dry ones) after proper processing can be kept in large open wooden shelves.

The humidity of the storehouse should then be as low as possible. Materials rich in volatile oils are advised to be kept in airtight containers. Otherwise, their efficacy will decrease as time passes by. If all factors are favorable, the prepared drugs can be used even after years of storage.