

Herbs as Raw Material

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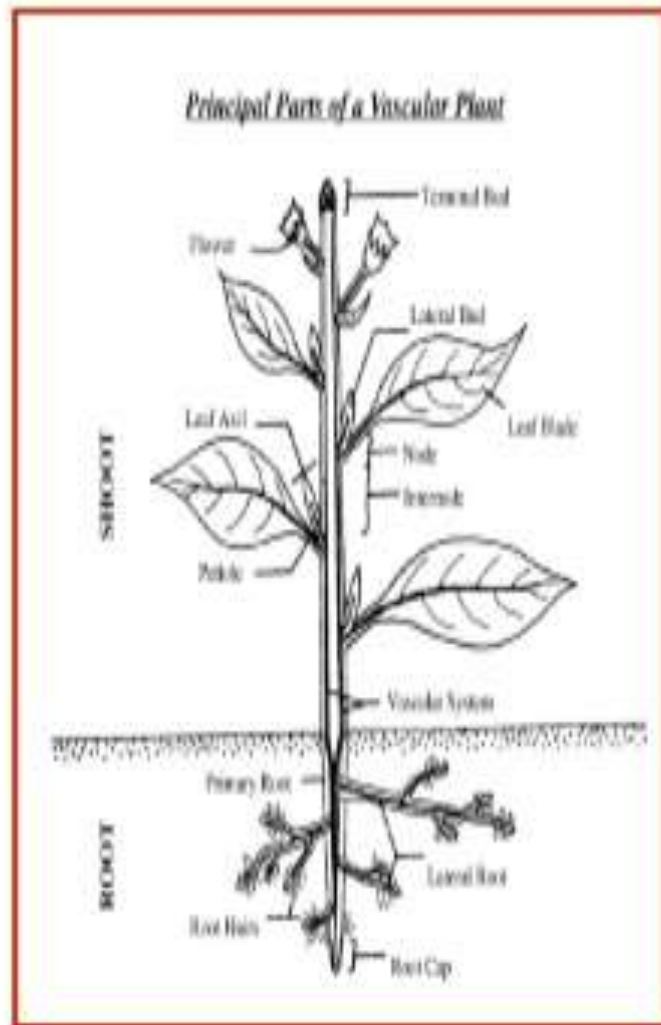
HERBS (Herba)

What is Herb?

In Pharmacognosy

Herb is a drug composed usually of the tender parts of the plant axis.

(the stem + leaves + flowers + fruits).



A medicinal herb

It is different from botanic term "herb": It refers to a plant or plant part valued for its medicinal, aromatic or savory qualities. Herb plants produce and contain a variety of chemical substances that act upon the body.

Herbal medicine = Botanical medicine= Herbalism=

Phytomedicine

It is the use of herbs for their therapeutic or medicinal value.

Difference between Herbal and Conventional Medicines

▪ Conventional medicine

- contains one active principle in high concentration
- is simple with single indication

▪ Herbal medicine

- contains several active principles in low concentrations.
- is complex promoted for several divergent uses.

Herbal materials

- Herbal materials include, in addition to herbs, fresh juices, gums, fixed oils, essential oils, resins and dry powders of herbs.
- In some countries, these materials may be processed by various local procedures, such as steaming, roasting or stirbaking with honey, alcoholic beverages or other plant materials.

Herbal preparations

- Herbal preparations are the basis for finished herbal products and may include comminuted or powdered herbal materials, or extracts, tinctures and fatty oils of herbal materials.
- They are produced by extraction, fractionation, purification, concentration or other physical or biological processes.
- They also include preparations made by steeping or heating herbal materials in alcoholic beverages and/or honey, or in other materials.

Finished herbal products

- Finished herbal products consist of one or more herbal preparations made from one or more herbs (i.e. from different herbal preparations made of the same plant as well as herbal preparations from different plants.
- Products containing different plant materials are called “**mixture herbal products**”. Finished herbal products and mixture herbal products may contain excipients in addition to the active ingredients.
- However, finished products or mixture herbal products to which chemically defined active substances have been added, including **synthetic compounds** and/or isolated constituents from herbal materials, are **not** considered to be “**herbal**”

Herbal medicine

- The definition of herbal medicine is the use of plants to prevent and treat an illness, or to achieve good health, as well as the drugs and tinctures that are used.
- *An example of herbal medicine is using a tincture made from **ginger** to relieve an **upset stomach**.*
- Also called **Herbalism**, **Phytomedicine** or **Phytotherapy**.

Herbal medicinal Product

- Herbal medicinal products are medicinal products where the active ingredient consists exclusively of herbal substances or herbal preparations.
- Natural remedies are medicinal products where the active ingredient is of natural origin and consists of an animal part, a bacterial culture, a mineral or a salt.

Herbal Drug Preparation

- **Herbal preparations** are the basis for finished **herbal** products and may include comminuted or powdered **herbal** materials, or extracts, tinctures and fatty oils of **herbal** materials. They are produced by extraction, fractionation, purification, concentration or other physical or biological processes.

Standardization of herbal drugs crude plant parts / plant material

Definition:

- name of plant
- part of plant
- Nature/condition of material: whole, powdered, fresh, dried, etc

Authentication/confirmation of:

- Correct geographical origin
- Correct stage of growth

Absence of foreign matter:

- other plant parts or materials
- soil, stones, dust
- insects and other animal matter (as determined by **microscopy, macroscopy, chromatography**)

Microscopic characteristics confirming identity:

- qualitative features
- quantitative features, (e.g. stomatal number)

Radioactive contamination limits: arising from environmental pollution or microbial decontamination procedures

Assay: for materials containing constituents of known therapeutic activity, or known unique (marker) compounds. Non-specific assay methods for groups of compounds may be used where specific assay methods are not available for single compounds

COLLECTION OF DRUGS

- Medicinal plant materials should be collected during the appropriate season or time period to ensure the best possible quality of both source materials and finished products.
- It is well known that the quantitative concentration of biologically active constituents varies with the stage of plant growth and development.
- The best time for collection (quality peak season or time of day) should be determined according to the quality and quantity of biologically active constituents rather than the total vegetative yield of the targeted medicinal plant parts.
- In general, the collected raw medicinal plant materials should not come into direct contact with the soil. If underground parts (such as the roots) are used, any adhering soil should be removed from the plants as soon as they are collected.
- Collected material should be placed in clean baskets, mesh bags, other well aerated containers.

- After collection, the raw medicinal plant materials may be subjected to appropriate preliminary processing, including elimination of undesirable materials and contaminants, washing (to remove excess soil), sorting and cutting.
- The collected medicinal plant materials should be protected from insects, rodents, birds and other pests, and from livestock and domestic animals.
- If the collection site is located some distance from processing facilities, it may be necessary to air or sun-dry the raw medicinal plant materials prior to transport.
- If more than one medicinal plant part is to be collected, the different plant species or plant materials should be gathered separately and transported in separate containers. Cross-contamination should be avoided at all times.
- Collecting implements, such as machetes, shears, saws and mechanical tools, should be kept clean and maintained in proper condition.
- Those parts that come into direct contact with the collected medicinal plant materials should be free from excess oil and other contamination.

HARVESTING

- Medicinal plants should be harvested during the optimal season or time period to ensure the production of medicinal plant materials and finished herbal products of the best possible quality.
- Care should be taken to ensure that no foreign matter, weeds or toxic plants are mixed with the harvested medicinal plant materials.
- Medicinal plants should be harvested under the best possible conditions, avoiding dew, rain or exceptionally high humidity.
- If harvesting occurs in wet conditions, the harvested material should be transported immediately to an indoor drying facility so as to prevent any possible deleterious effects due to increased moisture levels, which promote microbial fermentation.
- Cutting devices, harvesters, and other machines should be kept clean and adjusted to reduce damage and contamination from soil and other materials.

As per WHO Guidelines

1. Medicinal plants/herbal drugs should be harvested when they are at the best possible quality for the proposed use.
2. Damaged plants or parts plants need to be excluded.
3. Medicinal plants/herbal drugs should be harvested under the best possible conditions avoiding wet soil, dew, rain or exceptionally high air humidity. If harvesting occurs in wet conditions possible adverse effects on the medicinal plant/herbal drug due to increased moisture levels should be counteracted.
4. Cutting devices or harvesters must be adjusted such that contamination from soil particles is reduced to a minimum.
5. The harvested medicinal plant/herbal drug should not come into direct contact with the soil. It must be promptly collected and transported in dry, clean conditions.

6. During harvesting, care should be taken to ensure that no toxic weeds mix with harvested medicinal plants/herbal drugs.
7. All containers used during harvesting must be clean and free of contamination from previous harvests. When containers are not in use, they must be kept in dry conditions free of pests and inaccessible to mice/rodents, livestock and domestic animals.
8. Mechanical damage and compacting of the harvested medicinal plant/herbal drug that would result in undesirable quality changes must be avoided.
9. Freshly harvested medicinal plants/herbal drugs must be delivered as quickly as possible to the processing facility in order to prevent thermal degradation.
10. The harvested crop must be protected from pests, mice/rodents, livestock and domestic animals. Any pest control measures taken should be documented.

DRYING

When medicinal plant materials are prepared for use in dry form, the moisture content of the material should be kept as low as possible in order to reduce damage from mould and other microbial infestation.

Medicinal plants can be dried in a number of ways

1. In the open air (shaded from direct sunlight);
2. Placed in thin layers on drying frames, wire-screened rooms or buildings.
3. By direct sunlight, if appropriate.
4. In drying ovens/rooms and solar dryers.
5. By indirect fire; baking; lyophilization; microwave; or infrared devices.
6. Vacuum drying
7. Spray dryer: Examples: Papaya latex and pectin's, etc.

- The most common method for preserving plant material is drying.
- Enzymatic processes take place in aqueous solution. Rapid removal of the water from the cell will, therefore, largely prevent degradation of the cell constituents.
- •Drying also decreases the risk of external attack, e.g. by moulds.
- leaves may contain 60-90% water, roots and rhizomes 70-85%, and wood 40-50%. The lowest percentage, often no more than 5-10%, is found in seeds.
- To stop the enzyme processes, the water content must be brought to about 10 %.
- The plant material is spread out on shallow trays, which are placed on mobile racks and passed into a tunnel where they meet a stream of warm air.
- The air temperature is kept at 20-40 °C for thin materials such as leaves, but is often raised to 60-70 °C for plant parts that are harder to dry, e.g. roots and barks.
- When the crude drug has been collected under primitive conditions, without access to a drier, it must be dried in the open.

STORAGE OF CRUDE DRUGS

1. Storage facilities for medicinal material should be well aerated, dry and protected from light, and, when necessary, be supplied with air-conditioning and Humidity control equipment as well as facilities to protect against rodents, insects.
2. The floor should be tidy, without cracks and easy to clean. Medicinal material should be stored on shelves which keep the material a sufficient distance from the walls; measures should be taken to prevent the occurrence of pest infestation.
3. Continuous in-process quality control measures should be implemented to eliminate substandard materials, contaminants and foreign matter prior to and during the final stages of packaging.
4. Processed medicinal plant materials should be packaged in clean, dry boxes, sacks, bags or other containers in accordance with standard operating procedures and national and/or regional regulations of the producer and the end-user countries.

PRESERVATION OF PLANT MATERIAL

The plant material must first be preserved so that the active compounds will remain unchanged during transport and storage.

The cells of living plants contain not only low molecular-weight compounds and enzymes, but they also have many kinds of barriers that keep these constituents apart.

When the plant dies, the barriers are quickly broken down and the enzymes then get the opportunity to promote various chemical changes in the other cell constituents, e.g. by oxidation or hydrolysis.

Thank
you

