Production (Management) of crud drugs

Production of crude drugs from their medicinal plants involves the following steps:

- Cultivation
- Collection
- Drying
- Storage

Crude medicinal drugs may be collected from: -

Y Wild growing medicinal plants.

Cultivated medicinal plants.

Cultivatedof medicinal plants

Cultivation of Crude drugs has the following advantages:

- The concentration of many the plants that need it in small areas simplifies collection.
- Cultivation provides an excellent mean for control of the purity of the crude drug.

- Cultivation assures regular and constant supply can be sufficient to market needs.
- The use of certain insecticides and pesticides help control of insect's infestations.

Disadvantages of cultivated medicinal plants are:

- Some medicinal plants require particular habitat for their growth and the procedures of their cultivation usually failure. i.e. Cannabis requires tropical climate to the production of narcotic resin while Aloes require a heavy rainfall.
- For successive cultivation of medicinal plants and production of crude drugs with quality, it is necessary to study the conditions under which medicinal plants flourish in their wild state and trying to reproduce these conditions or improve them.

Medicinal plant materials should be collected during the suitable 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**.

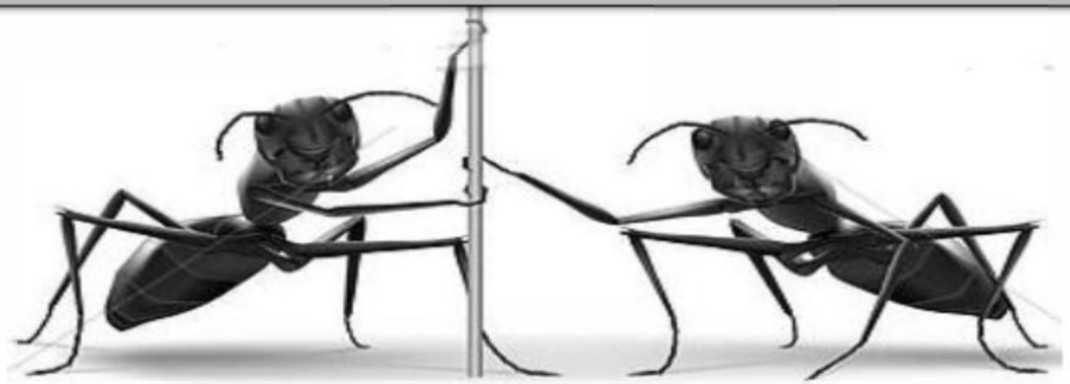
Leaves are collected as the **flowers** are beginning to **open**.

Flowers just before they are **fully expanded,** in certain cases as with cloves *(Eugenia* caryophyllata), the unopen flower is picked.

Underground organs as the aerial parts die down.

Fruits and seeds: when fully ripe and grown, or nearly grown.

- **Leaves, flowers** and **fruits** should not be **collected when** covered **with dew or rain** to prevent **any** possible harmful effects due to increased **moisture levels**, which promote microbial fermentation **and** mold.
- Any discolored or **attacked by insects** or **slugs should be rejected**
- **Age** affect **the** quantity **& the** quality.



Drying

Is the third process of drug production, it is achieved to remove water from the plant to retain the activity & prevents poilage & the conversion of the active compound to inactive one. Drying consists of removal of sufficient moisture content of the crude drug so as to Improve Its quality & make it resistant to the growth of m.o.

- If enzymatic action is to be encoul·aged, slow dryi1lg at a moderate temperature is necessary. e.g. ‘vanilla pods’ and ‘gentian roots’.
- Freshly pecked vanilla beans do not have any vanillin, whereas the fermentation of the pods causes its production, involving the enzymatic hydrolysis of glycoside.

If enzymatic action is not desired, drying should be take place as s0011 as possible after collection.

- Drugs containing volatile oils are liable to lose their aroma if not dried or if the oil is not distilled from them immediately, and all dried drugs are liable to develop mould. For these reasons, drying apparatus and stills should be situated as near to the growing plants as possible.

- **Rapid drying** helps **flowers** and **leaves** to **retain** their **color** and **aromatic** drugs their **aroma**, but the temperature used in each case must be governed by the constituents and the physical nature of the drug.

Drying Methods

- Air Drying
- Artificial Drying
- Vacuum Drying

Air drying included:

- Sun Drying
- Shade Drying

Artificial Drying :

- Generally the most acceptable form of drying herbs.
- Rapid (less exposure to heat less chances of chemical alteration).
- Control temperature (nonnally 40°C) & ventilation (allows dry air to replace wet air).

Vacuum Drying

- Steam-heated ovens: pump used to extract air
- Low pressure to ensure rapid and complete drying
- Expensive method
- Reserved for expensive herbs and which cannot be sufficiently dried through other methods.

As a general rule

leaves herbs and flowers may be dried between 20 and 40C° and barks and roots between 30 and 65C°.

For rural tropical areas, solar dryers have some distinct advantages over conventional artificial heat dryers.

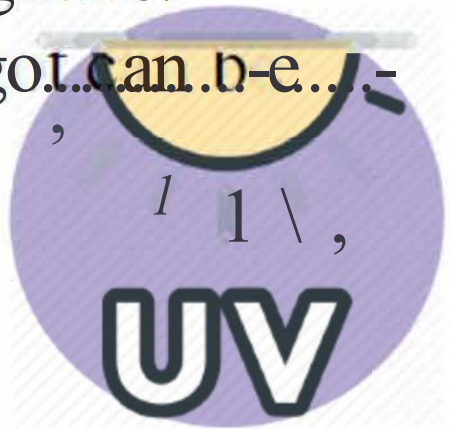

The Desiccator
air tight lid
perforated mesh
drying agent
(calcium chloride)

Storage

- **Preservation** of the plant drugs needs sound **knowledge** of their physical & chemical properties
- All drugs should be preserved in a well **closed** & **filled** container.
- The premises should be **water proof, fire proof** & **rodent proof** are ideal for storage. An number of drugs absorbed moisture from the atmosphere & become susceptible to growth of m.o.(some of them can absorb moisture up to 25% of their weight).

- Excessive moisture facilitate enzymatic reactions resulting in a decomposition of active constitu.ents such as digitalis leaves. Ergot excessive moisture can lead to mould infestation.

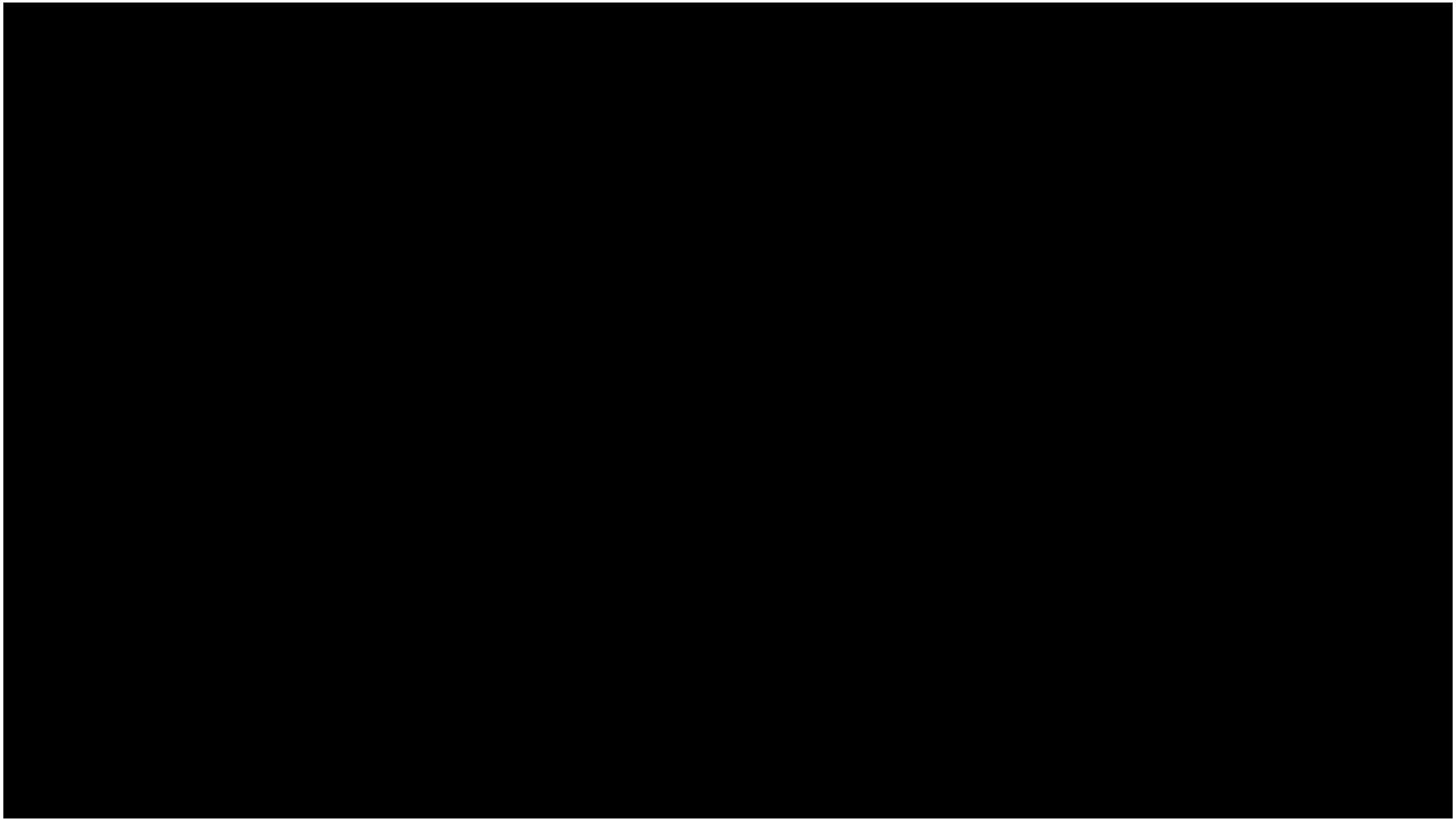
- Radiation due to direct sun light also causes destruction of active chemical constituents as in case of Ergot, Cod liver oil & digitalis. Fixed oil in powdered leaves of Ergot can be-e...- rancid.



Atmospheric oxygen is also destructive, this is why the containers should be filled & filled completely or the air in the container should be replaced by an inert gas like nitrogen as in shark liver oil.

Temperature is a very important factor to be considered in the preservation, since it can accelerate several chemical reactions leading to decomposition of the active constituent. So most of drugs need to be stored in a temperature between 1-5 C^0 to prevent microbial growth.

Vacuum drying



End of Lecture
Good Luck!

See you

In next lecture..