

EXTRACTION

Extraction:

Is the separation of active portions of plant (and animal) tissues using selective solvents (or solvent system, solvent mixture) through standard procedures



- **Extraction** will remove from the plant **active substances** which can be **dissolved** in solvent or solvent system
- The **undissolved** portion of the drug that remain after the extraction is completed is called **the marc** and **menstruum** is the solvent used for extraction.



The basic parameters influencing the quality of an extract:



Plant part used as starting material



Solvent used for extraction



Extraction procedure



Plant part:

We should choose the correct part of plant that contain the active constituent.



Choice of solvents Successful

Determination of biologically active compounds depends on the type of solvent used in the extraction procedure
property of a good solvent in plant extraction

- High capacity for extraction.
- Low toxicity.
- Ease of evaporation at low heat.
- Promotion of rapid physiologic absorption of the extract.
- Preservative action.
- Not react with the extracted compound or with other compounds in the plant material.
- Have low price
- Harmless to the man and to the environment

General techniques of extraction

 **Cold** methods

 **Hot** methods

 **Continuous hot** method



Cold methods



- A) Maceration**
- B) Percolation**
- C) Infusion**

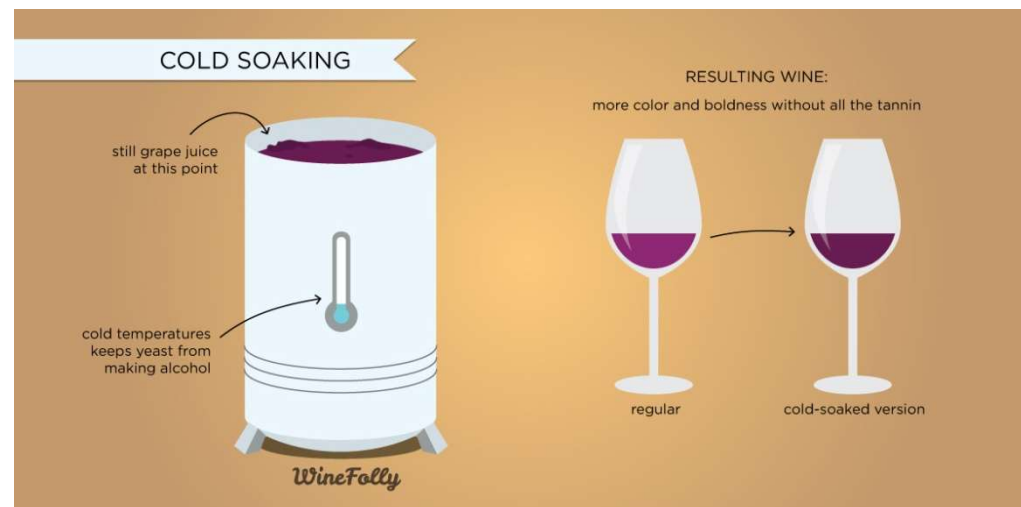


Maceration

The **solid** plant material is mixed with suitable solvent (or solvent system) in a well closed **container** & left aside for at **least 3 days** at room temperature **(???)** with agitation form time to time.



- Most of **active** constituents are **dissolved** in the selected **solvent** & the extract could be **separated** by **filtration**
- This method is best suitable for use in case of the **thermolabile** drugs.



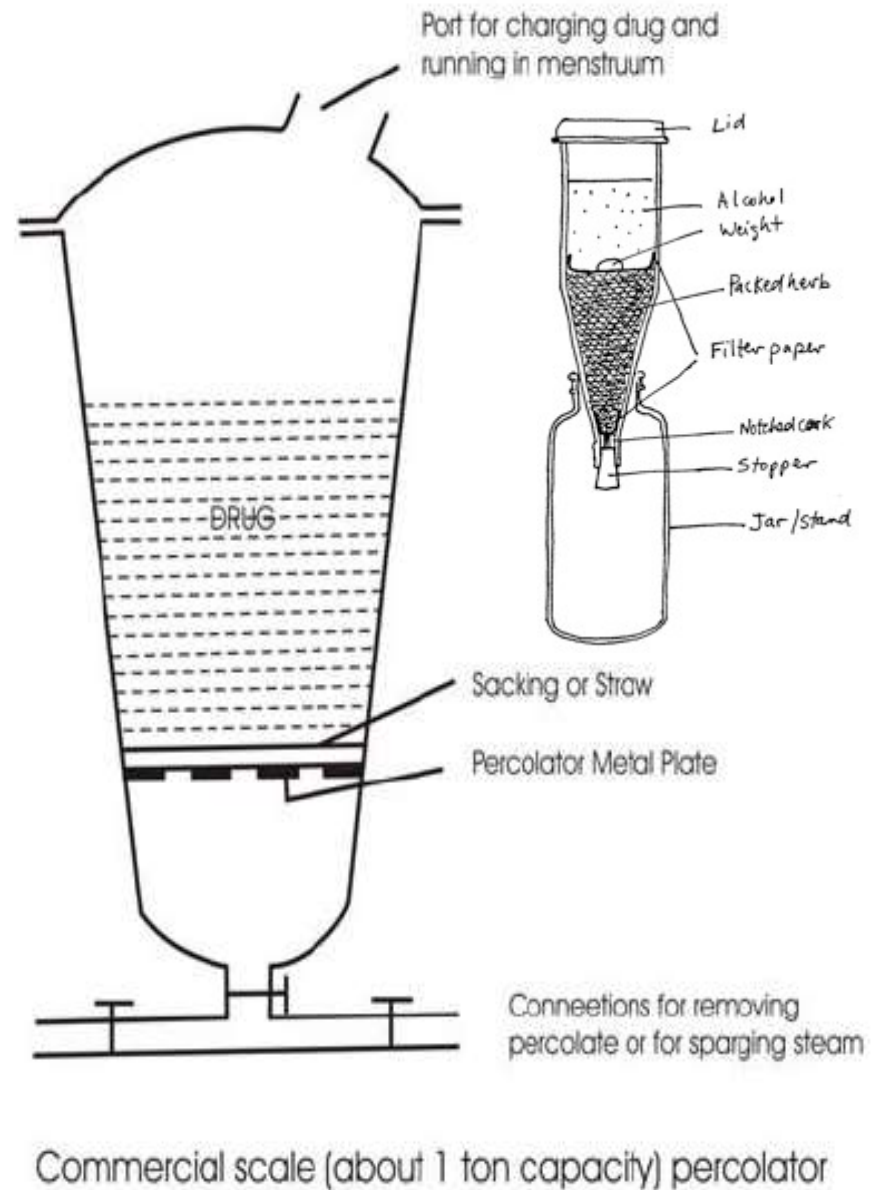
Percolation

- Is a **continuous** flow of the solvent through the bed of the crude drug material to get the extract. In this process, the powdered drug is moistened with an appropriate amount of the specified menstruum and allowed to stand for approximately **4 h** in a well closed container, after which the mass is packed and the top of the percolator is closed. Additional menstruum is added to form a shallow layer above the mass, and the mixture is allowed to macerate in the percolator for **24 h**



- The outlet of the percolator then is opened and the liquid contained there is allowed to drip slowly. Additional menstruum is added as required, until the percolate measures about three-quarters of the required volume of the finished product. The marc is then pressed and the expressed liquid is added to the percolate. Sufficient menstruum is added to produce the required volume, and the mixed liquid is clarified by filtration or by standing followed by decanting.

Different solvent may be used in this method **without removing** the **plant** material example: adding the **non-polar** solvent to extract **non-polar** compounds, then **polar** solvent to extract **polar** compounds.



Infusion

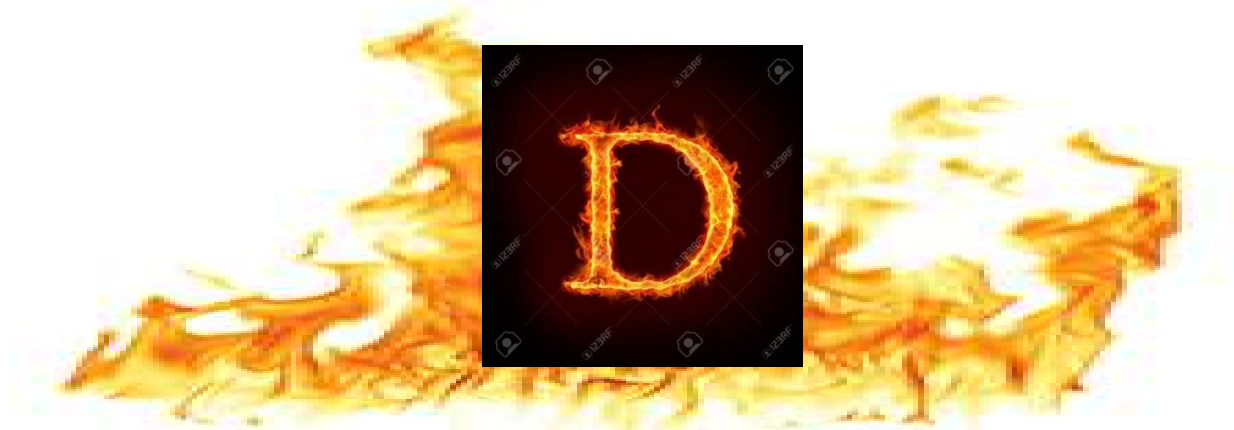
- Fresh infusions are prepared by **macerating** the crude drug for a **short period** of time with **cold** or **boiling water**.
- These are dilute solutions of the readily soluble constituents of crude drugs.
- Pour **recently boiled (Not boiling)** water **over plant parts** for **10-30 minutes** is what most prescriptions require.
- Cold infusions or sun infusions can take **up to 12 hours**.
- Must be used **within 12 hours** of preparation, or if **refrigerated**, within two days.



Hot methods



- A) Decoction**
- B) Digestion**



Decoction

- It is used for 1) water soluble & 2) heat stable substances by boiling the material for about 15 min. with water followed by filtration & washing the residue (the marc) by marc solvent. For plant parts that are lignified (hard or woody) Not for volatile principles. Place herb in cold water bring slowly to a boil.

Digestion

- It is a method of **maceration** in which a **{{gentle heat}}** is used during extraction process to **increase** the **solubility** of the **active** constituent. Used when slightly elevated temperature is not objectionable.

3) Continuous hot method

- **A) Ordinary reflex method**
- **B) Distillation method**
- **C) Soxhlet extraction.**

