**Lab2**

**Extraction techniques of Medicinal plants Extraction**

**, as the term is used pharmaceutically, involves the separation of medicinally active portions of plant or animal tissues from the inactive or inert components by using selective solvents in standard extraction procedures. The products so obtained from plants are relatively impure liquids, semisolids or powders intended only for oral or external use. These include classes of preparations known as decoctions, infusions, fluid extracts, tinctures, pilular (semisolid) extracts and powdered extracts. Such preparations popularly have been called galenicals, named after Galen, the second century Greek physician. The purposes of standardized extraction procedures for crude drugs are to attain the therapeutically desired portion and to eliminate the inert material by treatment with a selective solvent known as menstruum. The extract thus obtained may be ready for use as a medicinal agent in the form of tinctures and fluid extracts, it may be further processed to be incorporated in any dosage form such as tablets or capsules, or it may be fractionated to isolate individual chemical entities such as ajmalicine, hyoscine and vincristine, which are modern drugs. Thus, standardization of extraction procedures contributes significantly to the final quality of the herbal drug.**

**Muslim scientists were credited with extracting and inventing the distillation device, and knowing its properties and indications. Natural oils and extracts were a popular commodity that caravans carried with silk to distant horizons. Centers for spices and aromatic oils were established, which are important in the manufacture of medicine, cosmetics, and antibacterials. Soaps, paints, and oils are extracted by distillation, using organic solvents, or pressing**

**Medicinal plants are considered non-traditional crops. Humans have used them throughout the ages as foods, others as medicine, and for various purposes. At times, they were used as spices when cooking food and to treat many diseases that affect humans or alleviate the symptoms of the disease.**

**Methods of Extraction of Medicinal Plants Maceration**

1. **Maceration**
2. **Infusion**
3. **Digestion**
4. **Decoction**
5. **Percolation**
6. **Hot Continuous Extraction (Soxhlet)**
7. **Aqueous Alcoholic Extraction by Fermentation**

**Counter-current Extraction**

**This extraction process has significant advantages:**

 **i)** A unit quantity of the plant material can be extracted with much smaller volume of solvent as compared to other methods like maceration, decoction, percolation.

 **ii)** CCE is commonly done at room temperature, which spares the thermolabile constituents from exposure to heat which is employed in most other techniques.

**iii)** As the pulverization of the drug is done under wet conditions, the heat generated during comminution is neutralized by water. This again spares the thermolabile constituents from exposure to heat.

 **iv)** The extraction procedure has been rated to be more efficient and effective than continuous hot extraction.

**Active substances are found in most parts of plants: flowers, leaves, roots, fruits, stems and seeds**

Flowers: such as roses and jasmine.

Leaves: like mint

Fruits: such as oranges and lemons.

Seeds: such as nutmeg and cardamom

Roots: such as licorice and iris.

Stems: such as pine and sandalwood

All parts of the plant: such as lemongrass

**Active ingredients in medicinal plants**

• Digoxin glycosides are a medicinal substance derived from the Digitalis plant and are used to treat heart failure

• Alkaloids…

• Tannins... polyphenolic plant compounds with high molecular weight found in many plants (leaves - fruits - stems - bark...) and are usually located within the gaps.

• Soaps…

• Resins… is a sticky, gummy substance exuded by some plants, especially conifers and succulents.

• Volatile oils. …

• Lipids