

Classification of Crude Drugs

Presented by

Dr. V. B. Ghawate,

Vice Principal,

MES's College of Pharmacy, Sonai.

Classification of crude Drugs

- Crude drug i.e. Simple drug
- Crude drugs are plant, animal or their parts which after collection are subjected only to drying or making them into transverse/longitudinal slices pieces or peeling them in some cases. They exist in natural form.
- Crude drugs may be derived from various natural sources like Plants, Animals, Minerals, Marine and Micro-organisms etc.

Group of crude drugs

- Crude drugs are further grouped as –
1]ORGANISED (CELLULAR).

2]UNORGANISED (NON-CELLULAR)

according to whether they contain a regularly organised cellular structure or not.

CLASSIFICATION OF CRUDE DRUGS

- Although each system of classification has its own merits and demerits, but for the purpose of study the drugs are classified in the following different ways -
- Alphabetical classification
- Morphological classification
- Taxonomical classification
- Pharmacological classification
- Chemical classification
- Chemo-taxonomical classification
- Serotaxonomical classification

1. Alphabetical classification

The crude drugs are arranged according to the alphabetical order/form of their Latin and English names. Some of the Pharmacopoeias and reference books which classify crude drugs according to this system are as follows-

- Indian Pharmacopoeia. (IP) 1955 (Latin) , (IP) 1966 (English)
- British Pharmacopoeia. (BP) (English)
- United States Pharmacopoeia & National Formulary, (USP) (English)
- British Herbal Pharmacopoeia.
- British Pharmaceutical Codex.
- European Pharmacopoeia (Latin Titles).
- Encyclopedia of common natural ingredients used in Drugs and Cosmetics.

- e.g.: Acacia, Benzoin, Cinchona, Dill, Ergot, Fennel, Gentian, Hyoscyamus, Ipecacuanha, Jalap, Kurchi, liquorice, Myrrh, Nux-vomica, Opium, Podophyllum, Quassia, Rauwolfia, Senna, Uncaria gambier, Vasaka, Wool fat, Yellow bees wax, Zedoary.

Advantages:

- It is simple method, in this system location, tracing and addition of the drug is easy.
- This method provides quick reference search of the crude drug.

Disadvantages:

- Scientific nature of the drug cannot be identified by this method, whether they are organised or unorganized drug.
- This system does not help in distinguishing the drugs of plant, animal and mineral source. (Original source is not clear)

2. Morphological classification

- Here the crude drugs are arranged (Grouped) according to the part of the plant or animal represented into organised (Cellular) drugs and unorganised (Acellular) drugs.
- Organised (Cellular): Drugs are the direct parts of the plant and are divided into leaves, barks wood, root, rhizome, seed, fruit, flower, stem, hair and fibers.

2.1 Example of organised drug

According to Plant parts -

- Leaves - Datura, Senna, Vasaka, Digitalis,
- Barks - Cinnamon, Cinchona, Kurchi,
- Wood- Quassia, Sandalwood
- Roots -Rauwolfia, Liquorice, Ipecac
- Rhizomes - Ginger, Podophyllum, Turmeric
- Flowers - Clove, Saffron, Pyrethrum
- Seeds - Nux vomica, Linseed, Isapgol
- Fruits - Fennel, Coriander, Dill
- Stems - Ephedra
- Hair and Fibres - Cotton, Hemp, Jute

2.2 Unorganised (Acellular):

- Drugs are the products of plant, animal and mineral sources like-
- dried latex, dried juice, dried extracts, gums, resins, fixed oils and fats, waxes, volatile oil, animal products, minerals (Solids, liquids, semi solids etc).

Example of unorganized drugs

- Plant, animal, Mineral Drugs Dried latex Opium, Papain
- Dried Juice - Aloe Vera
- Dried extracts - Agar, Catechu, Pectin Gums Acacia, Tragacanth, Stericulia
- Resins – Benzoin, Colophony, Asafoetida Fixed oils and fats Castor , Chaulmoogra, Cotton seed
- Waxes- Beeswax, Spermaceti
- Volatile oils - Coriander, Cinnamon, Clove
- Animal products - Bees wax, Shark liver oil, Gelatin
Minerals Bentonite, Kaolin, Talc

Advantages:

- This system of classification is more convenient for practical study especially when the chemical nature of the drug is not clearly understood.
- This type of classification is very useful in identifying the adulterants used.

Disadvantages:

- It does not give an idea about chemical constituents and therapeutic uses of drug.
- During collection, drying and packing morphology of the drug changes ,then they are difficult to study.

3. Chemical classification

- Crude drugs are divided into different groups according to the chemical nature of their most important constituent present in the drug to which the pharmacological/therapeutic activity of drug is attributed.

- **Chemical constituents of Drugs -**
- Alkaloids - Datura, Vasaka, Vinca, Lobelia
- Glycosides - Cascara, Senna, Digitalis
- Tannins - Catechu, Myrobalan, Ashoka
- Volatile oil - Clove, Eucalyptus, Cinnamon
- Lipids - Castor oil, Beeswax, Arachis oil
- Carbohydrates and derived products - Acacia, Agar, Honey, Linseed, Tragacanth, Starch
- Resins -Colophony,
- Vitamins and hormones – Yeast, Shark liver oil, Insulin
- Proteins and enzymes - Gelatin, Papain,

Advantages :

- known chemical constituents are easy to study the drug.
- popular approach for phytochemical study.

Disadvantages :

- Drugs of different origin are grouped under similar chemical titles.
- This type of classification makes no proper placement of drugs containing two different types of chemicals.
Eg: Certain drugs are found to contain alkaloids and glycosides (Cinchona), Fixed oil and volatile oil (Nutmeg) of equal importance together and hence it is difficult to categorize them properly

4. Taxonomical classification

In this system the drug are arranged according to taxonomical studies. The drugs are arranged according to their phylum, order, family, genus and species. It is purely a type of botanical classification or biological classification and restricted mainly to crude drugs from plant source.

Example of Nuxvomica (*Strychnos nuxvomica*)

Division - Angiosperm

Class – Dicotyledon

Order – Gentiales

Family – Loganiaceae

Genus – Strychnos

Species - Nuxvomica

Advantages:

- It will provide proper idea about species and varieties of the organism.

Disadvantages:

- The system is criticized for its failure to recognize the organised / unorganised nature of crude drugs in their morphological studies.
- The system fails to face into an account chemical nature of active constituent and therapeutic significance of crude drugs.

5. Pharmacological classification

- Here, the crude drugs are grouped according to pharmacological action (Therapeutic action) of their chief active constituent (most important) or therapeutic uses.
- This system of classification involves the grouping of crude drugs according to the pharmacological action of their active constituents or their therapeutic uses, regardless of their morphology, taxonomical status, or chemical relationships.
- The drugs differing in mechanism of action but having same pharmacological effects are also grouped together, e.g. bulk purgatives, irritant purgatives, emollient purgatives

- Cardiac depressant - Cinchona, Veratrum
- Cardiotonics - Digitalis, Squill, Strophanthus
- Expectorant - Licorice, Ipecacuanha, Vasaka
- Antiexpectorant - Stramonium leaves
- Brochodilators - Ephedra, Tea (Theophylline)
- Central analgesics - Opium (morphine)
- CNS Stimulants - Coffee (caffeine)

Advantages

- The special advantage is that if even chemical constituents of the crude drugs are not known they can be classified properly on the basis of therapeutic or pharmacological effect.

Disadvantages

- Regardless of morphology, taxonomical status or chemical nature, the drugs are grouped together, provided they exhibit similar pharmacological uses.
- Eg: Senna, Castor oil, Jalap, Colocynth are grouped together as purgatives/laxatives because of their common pharmacological action.

6. Chemo-taxonomical classification

- Chemo-taxonomical classification.
- Investigation of distribution of chemical compounds or group of biosynthetically related compounds in a series of related plants.
- In this system, equal importance is given for taxonomical status and chemical constituents. There are certain types of chemical constituents which are characteristics of certain classes of plants.
- The character most often studied in chemotaxonomy are secondary metabolites of pharmaceutical significance such as alkaloids, glycosides, flavonoids, etc. DNA hybridization, amino acid sequencing in proteins.
- Eg: Tropane alkaloids generally occur in most of the members of Solanaceae.
- Eg: Volatile oils occur in the members of Umbelliferae.

7. Serotaxonomical Classification

- Serology is defined as that portion of biology, which is concerned with the nature and interactions of antigenic material and antibodies.
- Proteins most widely used as antigen in serotaxonomy are those which carry useful taxonomic information.
- When foreign cells or particles (antigens) are introduced into an organism, antibodies are produced in the blood (antiserum). The substance capable of stimulating the formation of an antibody is called antigen and the highly specific protein molecule produced by plasma cells in the immune system in response to the antigen is called antibody.

The classification is based on similar plants by means of differences in the proteins they contain.

- For example, to know the closeness of the **taxon A with B, C, D, E.**
- The proteins from A are extracted and are injected into the experimental animal rabbit or mice.
- The experimental animal in return produces antibodies. These antibodies are extracted from the blood of the experimental animal in the form of antiserum.
- When this antiserum is allowed to react with the original protein extract from A, complete coagulation takes place.
- When this antiserum is allowed to react with the protein extracts from other taxa B, C, D, E the degree of coagulation varies.
- The degrees of coagulation are compared to know the closeness of the taxa. More the degree of coagulation more is the closeness.

Ayurveda's immunity boosting measure for self care during COVID 19 crisis

General Measures

1. Drink warm water throughout the day.
2. Daily practice of Yogasana, Pranayama and meditation for at least 30 minutes as advised by Ministry of AYUSH.
3. Spices like Haldi (Turmeric), Jeera (Cumin), Dhaniya (Coriander) and Lahsun (Garlic) are recommended in cooking.

Ayurveda's immunity boosting measures for self care during COVID 19 crisis

Ayurvedic Immunity Promoting Measures

1. Take Chyavanprash 10gm (1tsf) in the morning. Diabetics should take sugar free Chyavanprash
2. Drink herbal tea / decoction (Kadha) made from Tulsi (Basil), Dalchini (Cinnamon), Kalimirch (Black pepper), Shunthi (Dry Ginger) and Munakka (Raisin) - once or twice a day. Add jaggery (natural sugar) and / or fresh lemon juice to your taste, if needed.

Ayurveda's immunity boosting measures for self care during COVID 19 crisis

3. Golden Milk- Half tea spoon Haldi (turmeric) powder in 150 ml hot milk - once or twice a day.

During dry cough / sore throat

1. Steam inhalation with fresh Pudina (Mint) leaves or Ajwain (Caraway seeds) can be practiced once in a day

2. Lavang (Clove) powder mixed with natural sugar / honey can be taken 2-3 times a day in case of cough or throat irritation.

Thank You.