CLASSIFICATION OF CRUDE DRUGS

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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 and micro-organisms etc.

- **Source of crude drugs**

SN	Source	Example
1	Vegetable source	Fennel, Dill, Senna
2	Animal source	Honey, Beeswax, Sharkliver oil
3	Mineral source	Talc, Chalk, Bentonite

Types of crude drug

- 1) Organized crude drug
- 2) Unorganized crude drug

Difference between Organized crude drug and unorganized crude drug

SN	Organized crude drug	unorganized crude drug
1	It is obtained from definite anatomic parts of plant such as flowers, leaves, fruits, etc.	It is obtained from plants or animals by means of physical process such as drying, incision and extraction, such as juices, resins, etc.
2	It is made up of definite tissue and cell.	It does not have cellular structure.
3	It is solid in nature.	It is solid, semisolid and liquid in nature.
4	Microscopic characters are used for identification.	Chemical test and physical standard are used for identification.
5	Botanical and zoological terminology can be used to describe the drug.	Such terminology are inadequate to describe these drugs, physical characters such as solubility, optical rotation, refractive index are used.
6	Examples: Fennel, coriander, etc	Examples: Aloe, Beeswax, etc

- Because of their wide distribution the arrangement of classification in a definite sequence is necessary to understand easily. 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:

ϖ Alphabetical classification

ϖ Morphological classification

ϖ Taxonomical classification

ϖ Pharmacological classification

ϖ Chemical classification

ϖ Chemo-taxonomical 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.

1) Indian Pharmacopoeia (IP) 1955 (Latin)

2) Indian Pharmacopoeia (IP) 1966 (English)

3) British Pharmacopoeia (BP) (English)

4) British Pharmacopoeia Codex (BPC) (English)

5) United States of Pharmacopoeia (USP) (English)

6) European Pharmacopoeia (Latin)

- **Advantages:**

- It is simple method, in this system location, tracing and addition of the drug is easy,

- No technical person is required for handling the system.

- **Disadvantages:**

- Scientific nature of the drug cannot be identified by this method, whether they are organised or unorganised drug.

- This system does not help in distinguishing the drugs of plant, animal and mineral source. (Original source is not clear)

- **Examples:**

- Acacia, Agar, Benzoin, Beeswax, Cinchona, Cinnamon, Digitalis, Datura, Ephedra, Fennel, Ginger, Isapagol, Jalap, Kino, Linseed, Mustard, Nutmeg, etc.

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.

- **Unorganised (Acellular):**

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

Plant parts	Drugs
Leaves	Datura, Senna, Vasaka, Digitalis,
Barks	Cinnamon, Cinchona, Kurchi,
Wood	Quassia, Sandalwood, Red sanders
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

Organised drugs (Plant)
(Cellular drugs)

Plant, animal, Mineral	Drugs
Dried latex	Opium, Papain
Dried Juice	Aloe, Kino
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

Unorganised drugs
(Acellular drugs)

- **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 biological source, chemical constituents and uses.

- When different parts of the plant contain different chemical constituents, it is difficult to classify them.

3. Chemical classifications of crude drugs

- Here, the 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	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, Benjoin,
Vitamins & hormones	Yeast, Shark liver oil, Insulin
Proteins & enzymes	Gelatin, Papain,

- **Advantages :**

- Chemical constituents are known,

- Medicinal uses are known

- **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 of crude drugs

- 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.

Phylum	Order	Family	Drugs
Angiosperms (Monocotyledons)	Liliflorae	Liliaccae	Colchicum, Asparagus Dioscorea, Vanilla
	Microspermae	Dioscoriaceae	
Angiosperms (Dicotyledons)	Papaverales	Papaveraceae	Opium
	Rosales	Rosales	Almond, Rose oil
		Leguminaceae	Glycyrihiza, Senna
	Rutales	Rutaceae	Bael,Lemon, Orange
	Rhamnales	Rhamnaceae	Cascara
	Malvales	Malvaceae	Cotton
	Umbelliflorae	Umbelliferae	Coriander,Caraway, Fennel
	Gentianales	Loganiaceae	Nuxvomica
		Gentianceae	Chirata
		Apocyanaceae	Kurchi, Strophanthus

- **Advantages:**

- Easy for the classification of crude drugs

- **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.

- The drugs obtained from plants having alternate leaves, flowers, seeds, capsules (Hyocyamus, Datura, Bellodonna, Stromonium) are considered with other members of solanaceae.

6.Pharmacological classification of crude drugs

Here, the crude drugs are grouped according to pharmacological action (Therapeutic action) of their chief active constituent (most important) or therapeutic uses.

- Bitter — Quassia, Cinchona, Gentian

- Carminatives — Dill, Clove, Fennel, Coriander

- Emetics — Ipecac

- Anti-amoebic — Kurchi, Ipecac

- Bulk Laxatives — Agar, Isapgol

- Purgatives — Senna, Castor oil

- Expectorant — Liquorice, Vasaka, Ipecac

- Antitussive — Opium

- Bronchodilators — Ephedra, Tea

- Cardio- tonics — Digitalis, Squill, Stropanthus

- Cardiac depressant - Cinchona, Veratrum

- Antihypertensive - Rauwolfia

- Central analgesics - Opium

- CNS stimulants - Coffee

- CNS depressants - Opium

- Antispasmodics - Bellodonna

- Anticancer - Vinca, Podophyllum, Cochicum

- Antirheumatics - Aconite, Guggul, Colchicum

- Anthelmintics - Vidang, Quassia, Malefern

- Astringents - Catechu.

- Antimalarials - Cinchona, Artemisia.

- Local anesthetics - Coca

- ## 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 uses.

- ## 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 of crude drugs

- **In this system of classification, the 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.

- Eg: Tropane alkaloids generally occur in most of the members of Solanaceae

- Eg: Volatile oils occur in the members of Umbelliferae and Rutaceae.