CLASSIFICATION OF CRUDE DRUGS

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CRUDE DRUGS

- The term ''crude drug'' generally applies to the products from plant and animal origin found in a raw form.

  The term crude drug also applied to inclusion of pharmaceutical products from mineral kingdom.

Crude Drugs

| Organized(cellular) | Unorganized(acellular) |

ORGANIZED DRUGS

- Organised drugs consist of the cellular organization in the form of anatomical features. These are mostly the crude drugs from plant sources. Almost all of the morphological plant parts or the entire plant itself can be called as an organized drugs .

Eg. Cinchona bark, Sandalwood, Rauwolfia roots, Nux Vomica seeds

- Microscopically and anatomical studies are preeminent for such drugs. These can be used directly in medicine or can be used by modifying or by extracting the active ingredient from it.

UNORGANIZED DRUGS

- The unorganized drugs do not have the morphological or anatomical organization as such. These are the product which come directly in the market but their ultimate source remains the plants, animals or mineral. Microscopical studies are not required for such crude drugs. These includes products like plant exudates as gums, oleogums, oleogumresins, plant lattices like that of opium, aloetic juices like aloes or dried extract of black catechu, pale catechu, agar, alginic acid, etc., are products coming under this group.

CLASSIFICATION OF DRUGS

- Drugs are classified in the following different ways------

Alphabetical classification

Taxonomical classification

Morphological classification

Pharmacological classification

Chemical classification

Chemo taxonomical classification

Serotaxonomical classification

ALPHABETICAL CLASSIFICATION

- Simplest way of classification
- Crude drugs are arranged according to alphabetical order of their Latin and English names(common names) or sometimes local language names(vernacular names).
- Some of the Pharmacopoeias, dictionaries and reference books which classify crude drugs according to this system are as follows:
- IP
- BP
- British herbal Pharmacopoeia
- United states Pharmacopoeia and National Formulary
- British Pharmaceutical codex
- European Pharmacopoeia

In European Pharmacopoeia these are arranged according to their names in Latin where in united states pharmacopoeia and British Pharmaceutical Codex, these are arranged in English.

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Merits –

Easy and quick to use

No repetition of entries and is devoid of confusion

Demerits-

No relationship between previous and succesive drug entries

TAXONOMICAL CLASSIFICATION

- Crude drugs are classified according to kingdom, subkingdom, division, class, order, family, genus and species as follows.

- The crude drugs of plant origin are classified on the basis of one of the accepted systems of botanical classification. A large number of plant families have certain distinguishing characteristics that permit crude drugs from these families to be studied at one time.

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Phylum	Spermatophyta
Division	Angiospermae
Class	Dicotyledons
Sub class	Sympetalae
Order	Tubiflorae
Family	Solanaceae
Genus	Atropa, Hyoscymus, Datura
Species	*Hyoscymus niger, Datura stramonium, Atropa belladona*

Phylum	Thallophyta
Class	Ascomycetes
Order	Clavicipitales
Family	Clavicipitaceae
Genus	Claviceps
species	*Claviceps purpurea*

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Merits-

 Taxonomical classification is helpful for studying evolutionary developments

Demerits-

 This system also does not correlate in between the chemical constituents and biological activity of the drugs.

Note-this system of classification is criticized for its failure to recognize the organized and unorganized nature of the crude drug.

MORPHOLOGICAL CLASSIFICATION

- Crude drugs are arranged according to the morphological or external characters of the plant parts or animal parts, i.e. which part of the plant is used as a drug,e.g. leaves, roots, stem, etc.

- Seeds- nux-vomica, strophanthus, Isabgol, castor

- Leaves- Senna, Digitalis, Vasaka, Eucalyptus

- Barks-cinchona, kurchi,cinnamon, Quaillaia

- Woods-Quassia, sandalwood, Sassafras, Red sanders

- Roots-Rauwolfia, Ipecacuanha,Aconite, Jalap

CONTINUED.........

- Rhyzomes- Turmeric, Ginger, Valerin, Podophyllum
- Flowers- Clove, Pyrethrum, Artemisia, Saffron
- Fruits- Coriander, colocynth, Fennel,Bael
- Entire drugs- Ephedra, Ergot, cantharides, Belladonna

The unorganized drugs are dried latex, gums, extracts,etc.

Eg.

1. Dried latices- opium, Gutta-Percha, Papain
2. Resin and Resin combinations- Balsam of Tolu, Myrrh, Asafoetida, Benzoin
3. Dried juices- Aloe, Kino, Red gum
4. Gums-Acacia, Tragacanth, Ghatti gum, Guar gum
5. Dried extracts- Gelatin, Catechu, Agar, Curare

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- Merits-

It is helpful to identify and detect adulteration.

This system of classification is more convenient for practical study and especially when the chemical nature of the drug is not clearly understood.

- Demerits-

There is no correlation between chemical constituents and therapeutic actions.

Repetition of drugs or plants occurs

PHARMACOLOGICAL CLASSIFICATION

- Drugs are classified according to their pharmacological action of their main active constituent or their therapeutic uses.
- Merits-

  This system of classification can be used for suggesting substitutes of drugs, if they are not available at a particular place or point of time.
- Demerits-

  Drugs having different action on the body get classified separately in more than one group that causes ambiguity and confusion. Cinchona is antimalarial drug because of presence of quinine but can be put under the group of drug affecting heart because of antiarrhythmic action of quinidine.

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Eg.

1.Drugs acting on git-

Bitter- Gentian, Quassia, cinchona

Carminative-Dill, Mentha, Cadamon

Emetics- Ipecacuanha

Anti-amoebics- Kurchi, Ipecacaunha

Bulk laxatives- Agar, Ispaghuha, Banana

Purgatives- Senna, Castor oil

Peptic ulcer treatment- Derivative of Glycyrrhetinic acid , Raw banana

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2. Drugs acting on respiratory system-

Expectorants- Liqurice, Ipecacaunha, vasaka

Antiexpectorant- stramonium leaves(Atropine)

Antitussives- Opium

Bronchodialators-Ephedra, Tea

3.Drugs acting on cardiovascular system-

Cardiotoics- Digitalis, Squill, Strophanthus

Cardiac depressant- Cinchona, Veratrum

Vasco-constrictors- Ergot, Ephedra

Antihypertensives- Rauwolfia

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4. Drugs acting on autonomic nervous system-

Adrenergic- Ephedra

Cholinergic- Physostigma, Pilocarpus

Anticholinergics- Belladona, Datura

5. Drugs acting on CNS-

Central analgesics- Opium

CNS stimulants- Coffee

Analeptics- Nux Vomica, Lobelia, Camphor

CNS depressants- Hyoscymus, Belladona, Opium

Hallucinogenics-cannabis,Poppy Latex

6. Anticancer-Vinca, Podophyllum, Campotheca, Taxus

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- 7. Antispasmodics-

Smooth muscle relaxants-Opium(Papavarine), Datura, Hyoscymus

Skeletal muscle relaxants- Curare

8. Antirheumatics- Aconite, Colchicum, Guggul

9. Anthelmintics- Quassia, Male Fern, Vidang

10. Immunomodulatory agents- Ashwagandha, Tulsi, Ginseng, Asparagus, Picrorrhiza, Kurroa

11. Drugs acting on skin and mucous membrane- Olive oil, wool fat, Beeswax, Balsam of tolu

12. Astringents- Myrobalan, Black catechu

CONTINUED.........

13. Antimalarials- Cinchona, Artemisia

14. Local anesthetics- Coca

15. Immunising agents- vaccines, Sera, Toxoids, Antitoxins

CHEMICAL CLASSIFICATION

- Crude drugs are classified according to their chemical constituent. The plants contain various constituents in them like alkaloid, glycosides, tannins, carbohydrates, saponin etc.

- Merits-

It is popular approach for phytochemical studies

- Demerits-

Ambiguities arise when particular drugs possess a number of compounds belonging to different groups of compounds.

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Eg.

Alkaloids- Cinchona, Datura, Vinca

Glycosides- Senna, Aloe

Carbohydrates and its derivatives- Acacia, Starch, Isabgol

Volatile oil- Clove, Coriander, Fennel

Tannins- Catechu, Tea

Lipids- Beesax

CHEMOTAXONOMICAL CLASSIFICATON

This system of classification relies on the chemical similarity of a taxon, *i.e.* it is based on the existence of relationship between constituents in various plants. There are certain types of chemical constituents that characterize certain classes of plants. For example, tropane alkaloids generally occur among the members of solanaceae, thereby, serving as a chemotaxonomic marker.

It is the latest system of classification that gives more scope for understanding the relationship between chemical constituents, their biosynthesis and their possile action.

SEROTAXONOMICAL CLASSICATON

* The serotxonomy can be explained as the study about the application or the utility of serology in solving the taxonomical problems. Antibodies are highly specific protein molecule produced by plasma cells in the immune system. Protein are carriers of the taxonomical information and commonly used as antigen in serotaxonomy.

* It express the similarities and the dissimilarities among different taxa, and these data are helpful in taxonomy. It determines the degree of similarity between species, genera, family,etc.,by comparing the reaction with antigens from various plant taxa with antibodies present against a given taxon.

* Serology helps in comparing nonmorphological characterisics, which helps in the taxonomical data. This technique also helps in the comparision of single proteins from different plant taxa.