Pharmacogosy

Lec. 1

Alkaloids

Alkaloids

- Definition:-
- Alkaloids are natural compounds display an expceptionally wide array of biological activities and have a wide distribution , being present in plants, fungi, bacteria, insects, marine, animal and man.
- Many drugs and poisons are alkaloids and many are well-known, such as:-
- Morphine, codeine, strychnine, nicotine, and cocaine.

Ditribution of alkaloids

- In the plants kingdom, the alkaloids appear to have a restricted distribution in certain families and genera.
- Among the angiosperms, the Apocyanaceae, Papaveraceae, Ranunculaceae, Rubiaceae, Solanaceae, and beberidaceae are outstanding for alkaloids-yielding plants.
- Although it has been claimed that monocotyledons do not produce alkaloids, investigation indicate that the Amarylidaceae and Liliaceae are two of the most promising families in which to search for alkaloids- yielding plants.

- Specific alkaloids are ordinarily confined to specific plant families (hyoscyamine in Solanaceae, colchicine in Liliaceae).

- There are an exception to this rule such as:-

1. Nicotine, which is found in a number of widely scattered plant families.
2. Ergot alkaloids in the fungus Claviceps pupurea

- Alkaloids may occur in various parts of the plants

1) In seeds (physostigma, areca).
2) In underground stems (sanguinaria).
3) In roots (belladonna root).
4) In rhizome and root (ipecac, hydrastic).
5) In barks (cinchona).
6) They also found in fungi (ergot).

Names of alkaloids

1. From the generic name of the plant yielding them as atropine (Atropa belladona).
2. From the specific name of the plant yielding them as belladonine (Atropa belladona).
3. From the common name of the drug yielding them as ergotamine (Ergot).
4. From their physiologic activity as emetine (Ipecac cause emesis).
5. From the discoverer as pelletrine.

- A suffix is added sometimes to designate the alkaloids which are similar in structure but differ their stereochemitry . For example quinine and quinidine.

- A prefix is added to designate alkaloids found in the same plant example hydroquinine.

- Alkaloids name should end with ine.

Classification of alkaloids

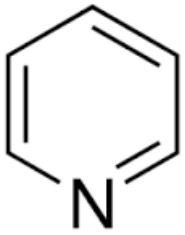
1. True alkaloids (characterized by a hetrocyclic ring with a nitrogen atom and are derived from amino acid).
2. Proto alkaloids (characterized by absence of the heterocyclic ring but derived from amino acid).
3. Pseudo alkaloids (characterized by a heterocyclic ring with a nitrogen atom, but are not derived from amino acids)(steroidal alkaloids).

- In general the alkaloids are classified according to the chemical structure into two broad division:-

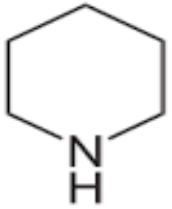
A. Non-hetrocyclic or a typical alkaloids or biological amines.
B. Hetrocyclic or typical alkaloids divided into 14 group according to their structure:-

1. Pyrrol and pyrrolidine.
2. Pyrrolizidine.
3. Pyridine and piperidine.
4. Tropane.
5. Quinoline.

6- isoquinoline.
7- aprophine.
8- norlupinane.
9- indole.
10- indolizine.
11- imidazole.
12- purine.
13- steroids.
14- terpenoid.

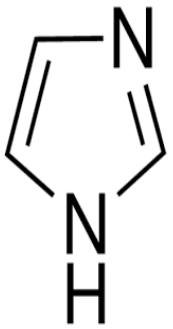


pyridine

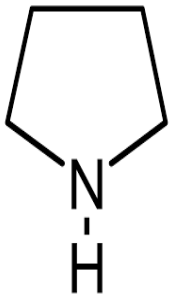


piperidine

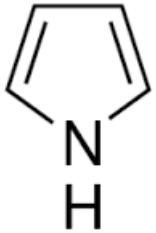
pyrrolizidine



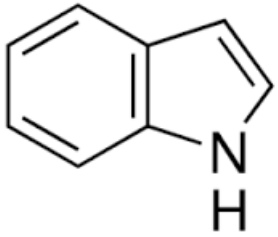
imidazole



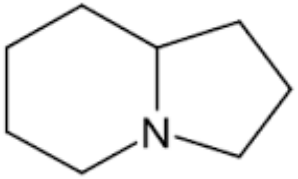
pyrrolidine



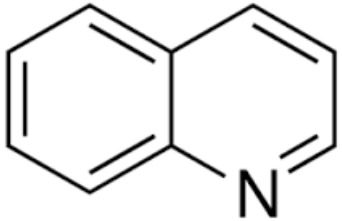
pyrrole



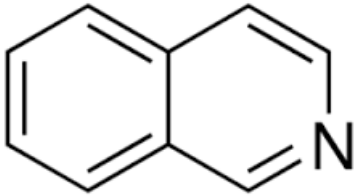
indole



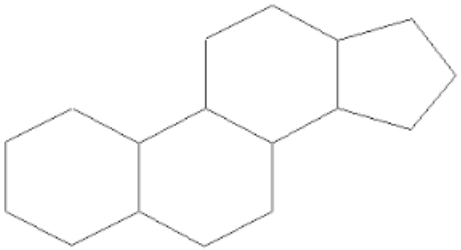
indolizidine



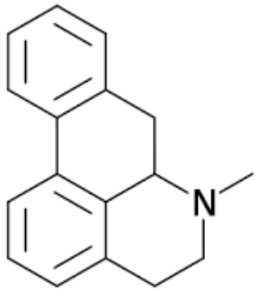
quinoline



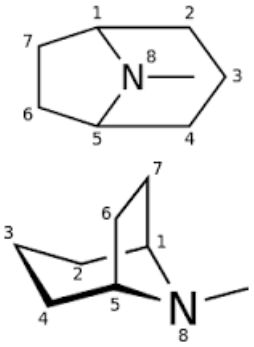
isoquinoline



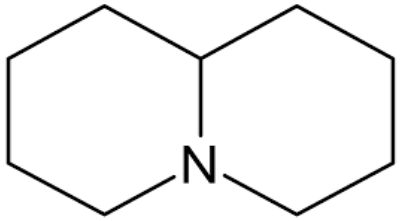
steroid



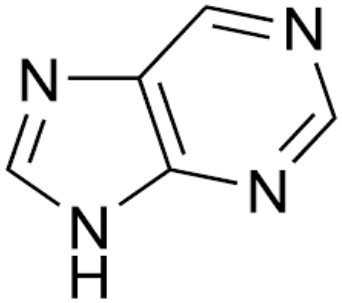
aporphine



tropane



norlupinane



purine

You should know the skeletal type but not the individual structure

Thank you for listining

The end