ALKALOIDS

- Term introduced by German chemist Carl F.W Meissnerin (1819).
- Alkaloids are basic nitrogen containing compound obtained from plant, animal and microorganism having marked physiological action.
- Term alkaloids are derived from "alkali like" they are basic in nature; they contain one or more nitrogen atom (usually in heterocyclic ring).

Properties:

- Most of alkaloids are basic in reaction due to the availability of lone pair of electron on nitrogen.
- Alkaloids are usually colorless, crystalline, non-volatile solids which are insoluble in water but soluble in ethanol, ether, etc.
- Some alkaloids are liquids, soluble in water. Ex: Nicotine
- Most alkaloids have a bitter taste and are optically active (laevorotatory).

Chemical Classification:

Alkaloids are classified according to the nature of heterocyclic ring.

- Heterocyclic Alkaloid (Typical alkaloid): Containing N-atom in the heterocyclic ring.

- Pyrrolidine – Ex: Hygrine
- Piperidine – Ex: coniine
- Pyridine-piperidine- Ex: Anabasine
- Quinoline – Ex: quinine,
- Isoquinoline – Ex: papavarine
- Indole – Ex: Lysergic acid
- Pyrrolidine - Pyridine – Ex: Nicotine
- Phenanthrene – Ex: Morphine
- Tropane – Ex: Atropine

- Purine – Ex: Caffeine

❖ B. Non-heterocyclic Alkaloid (Atypical alkaloid):

- Phenylethyl amine (Amino alkaloid) – Ex: Ephidrine
- Tropolone – Ex: Colchicine

Pharmacological activity:

Alkaloidals exhibit a wide range of pharmacological activities. They can be used as:

- Analgesic and narcotics: e.g. morphine
- CNS stimulants: e.g. caffeine
- Anticancers: e.g. vincristine, vinblastine and taxol
- Mydriatics: e.g. atropine
- Anti-asthmatics: e.g. ephedrine
- Antitussives: e.g. codeine.
- Expectorants: e.g. lobeline.
- Anti-hypertensives: e.g. reserpine
- Smooth muscle relaxants: e.g. papaverine
- Anthelmintics: e.g. pelletierine and arecoline.
- Antiparasitics: e.g. emetine

CHEMICAL TEST FOR ALKALOIDS :

S.No.	**Reagent ion**	**Observation**
1	Mayer's Reagent (Potassium mercuric iodide solution)	Creamy precipitate
2	Wagner's reagent (Potassium triiodide solution)	Reddish brown precipitate

3	Dragendroff's reagent (Potassium bismuth iodide solution)	Reddish brown precipitate
4	Hager's reagent (Picric acid)	Yellow precipitate