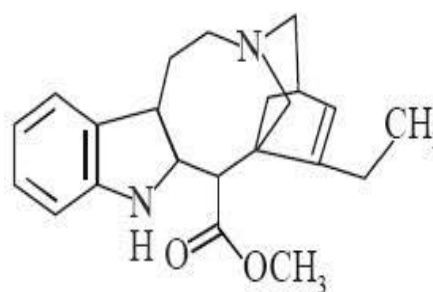
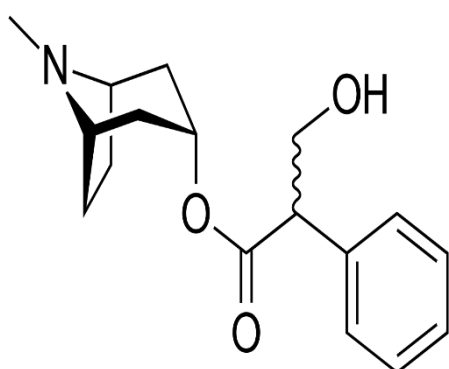




HAMDARD UNIVERSITY
FACULTY OF PHARMACY



PHARMACOGNOSY ADVANCED
(PHARM 513)



Cathranthine

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3RD YEAR (EVENING)

Submitted by:

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TROPANE ALKALOIDS

Condensation of tropane ring with piperidine constitutes the basic carbon framework of tropane nucleus. Plants of Solanaceae family are the major source of tropane alkaloids.

Atropine

Atropine is an alkaloid obtained from botanical sources (from *Atropa belladonna* Linné, from species of *Datura* Linné, and from *Hyoscyamus* Linné fam. Solanaceae) or produced synthetically. It is extremely poisonous.

Atropine sulfate occurs as colourless crystals or as a white, crystalline powder. It is extremely poisonous. It effloresces in dry air, is slowly affected by light, and is an anticholinergic.

Uses:

- Atropine sulfate is an anticholinergic.
- Used in surgery as an antispasmodic to control bronchial, nasal, pharyngeal, and salivary secretions, it is usually injected intramuscularly prior to induction of anesthesia.
- It is also useful in pylorospasm and other spastic conditions of the gastrointestinal tract and for ureteral and biliary colic when administered concomitantly with morphine.

Hyoscyamus

It is also called insane root, Hog's bean, Poison tobacco, Black Henbane.

Hyoscyamus or henbane is the dried leaf, with or without the stem and flowering or fruiting top, of *Hyoscyamus niger* Linné (Fam. Solanaceae).

contains not less than 0.04% of the alkaloids of *Hyoscyamus*

Uses :

- *Hyoscyamus* is smooth muscle relaxant, sedative, narcotic, anodyne, antiseptic, mydriatic and purgative agent.
- It is used in asthma and whooping cough.
- The parasympatholytic action of *Hyoscyamus* is weaker than *Stramonium* and *Belladonna*.

Scopolamine

Scopolamine or hyoscine is an alkaloid that is particularly abundant in *Datura fastuosa* var. *alba* and in *D. metel*. It is an ester that, upon hydrolysis, yields tropic acid and scopoline, a base resembling tropine. It occurs as an almost colorless, syrupy liquid from its chloroformic solution and as colorless crystals from its ether solution, it is levorotatory. Scopolamine hydrobromide or hyoscine hydrobromide occurs as colorless or white crystals or as a white, granular powder that is odorless and slightly efflorescent in dry air. It is extremely poisonous.

Uses :

- Scopolamine hydrobromide is classified as an anticholinergic.
- At usual therapeutic doses, scopolamine is a central nervous system depressant.
- Scopolamine is effective in the prevention of nausea and vomiting associated with motion sickness.

QUINOLINE ALKALOIDS

Alkaloids containing quinoline as their basic nucleus include those obtained from cinchona (quinine, quinidine, cinchonine, and cinchonidine). Cinchona and its alkaloids are the only members of this group that are therapeutically important at present.

Cinchona

Cinchona, cinchona bark, or Peruvian bark is the dried bark of the stem or of the root of *Cinchona succirubra* and also known in commerce as red cinchona.

Chemical Constituents : The Cinchona bark contains about 35 alkaloids (6.51/100). The cultivated bark contains 7-10% total alkaloids. The main alkaloids are quinine (70%), quinidine, cinchonine and cinchonidine. The alkaloids are present in combination with quinic acid, quinovic acid and cinchotannic acid. Cinchotannic acid is a polyphenol and its major amount is decomposed to give 'Cinchona red'.

Uses :

- Cinchona bark has antimalarial, antipyretic, and analgesic properties. Quinidine is used to treat prophylaxis of cardiac arrhythmias and atrial fibrillation. The barks and all preparations of Cinchona are specially valuable in intermittent fever.
- They have been prescribed as tonic in dyspepsia, gastric catarrh, adynamia and convalescence from fever, as a tonic and antiperiodic: it has been used in the prophylaxis and treatment of malaria.

ISOQUINOLINE ALKALOIDS

IPECAC:

Ipecac consists of the dried rhizome and roots of *Cephaelis ipecacuanha*. Ipecac yields not less than 2% of the ether-soluble alkaloids of ipecac.

Chemical Constituents : Ipecac contains 2-2.50% alkaloids of which 30-75% is emetine. The predominant alkaloids are emetine (40-70%), cephaeline, psychotrine, psychotrine methyl ether, protoemetine and emetamine.

Uses :

- Ipecac is emetic and used as an expectorant and diaphoretic and in the treatment of amoebic dysentery. The alkaloids have local irritant action.

OPIUM:

Opium or gum opium is the air-dried milky exudate obtained by incising the unripe capsules of *Papaver somniferum*.

Chemical Constituents: Opium contains about 25 alkaloids among which morphine (10-16%) is the most important base, The alkaloids are combined with meconic acid. The other alkaloids isolated

from the drug are codeine (0.8-2.5%), narcotine, thebaine (0.5-2%), noscapine (4-8%), narceine, and papavanne (0.5-2.5%). Morphine contains a phenanthrene nucleus.

Uses :

- Opium is a pharmaceutical necessity for powdered opium.
- it acts chiefly on the central nervous system; its action first stimulates and then depresses nerve response.
- It serves as an analgesic, a hypnotic and a narcotic and checks excessive peristalsis and contracts the pupil of the eye.

MORPHINE:

Morphine is the most important of the opium alkaloids. Morphine and the related alkaloids are phenanthrene derivatives. The molecule contains a phenolic and an alcoholic hydroxyl group.

Uses :

- Morphine and its salts are classed as narcotic analgesics; they are strongly hypnotic and narcotic. Their use tends to induce nausea, vomiting, constipation, and habit formation

INDOLE ALKALOIDS

The important alkaloids possessing Indole as a part of their structures are strychnine and brucine (Nux vomica), lysergic acid and its derivatives (Ergot), physostigmine (Physostigma), reserpine (Rauwolfia) and vinblastine and vincristine (Catharanthus). The compounds usually contain two nitrogens, one is present in the indole nucleus and the second is usually two carbons apart from the Beta-position of the indole ring.

Rauwolfia Serpentina

Rauwolfia serpentina is the dried root of Rauwolfia serpentina (Linné) Bentham ex Kurz (Fam. Apocynaceae). The plant is referred to as sarpgandha in Sanskrit, chota-chand or chandnka in Hindi.

Chemical Constituents : Rauwolfia contains about 0.7-2.4% total alkaloidal bases from which more than 80 alkaloids have been isolated. The prominent alkaloids isolated from the drug are reserpine, rescinnamine, w-reserpine, rescidine, raunescine and deserpidine

Uses :

- Rauwolfia is used as hypnotic, sedative and antihypertensive.
- It is specific for insanity, reduces blood pressure and cures pain due to affections of the bowels.
- It is employed in labours to increase uterine contractions and in certain neuropsychiatric disorders.

CATHARANTHUS

Catharanthus is the dried whole plant of *Catharanthus roseus* G. Don (syn. *Vinca rosea* Linn.)

(Family : Apocynaceae)

Chemical Constituents : About 90 alkaloids have been reported from *C. roseus*. Vindoline, and catharanthine are indole monomeric alkaloid. s. The alkaloids such as ajmalicine, lochnerine, reserpine, serpentine and tetrahydroalstonine are also present in other genera of Apocynaceae. About 20 dimeric alkaloids, including vindesine, vincristine and vinblastine, have been isolated from Catharanthus. These alkaloids possess antineoplastic activity

Uses :

- Catharanthus is used to cure diabetes and in wasp-sting. Vinblastine sulphate is an antitumor alkaloid employed to cure Hodgkin's disease and chlorionepithelioma. Vincristine sulphate is a cytotoxic compound and used to treat leukaemia in - children. Catharanthus alkaloids are antineoplastic in nature.

Nux vomica

Synonyms : Nux vomica seeds: Kuchia (Hindi); Quaker buttons: Bachelor's buttons; Poison nut; Dog buttons; Vomit nut: Crow fig; *Semina strychni*.

Biological Source Nux vomica is the ripe, dried seed of *Strychnos nux-vomica* Linn. which should contain 1.2% of strychnine. (Family : Loganiaceae)

Chemical Constituents About 1.8-5.3% of total alkaloidal base is present in Nux vomica. The main alkaloids of therapeutic importance are strychnine (1.25%) and brucine (1.5%) which are present in large thick-walled cells of endosperm.

Uses :

- Strychnine is used as circulatory stimulant and bitter tonic.
- Nux vomica increases the tone of intestine. It is given in atonic dyspepsia, as nervine and sex tonic, circulatory stimulant in surgical shock, alcohol poisoning and as vermine killer.
- Strychnine improves the appetite and digestion.

