

## السنة الثالثة

### عقاقير 2

د. عصام آغا

نظري





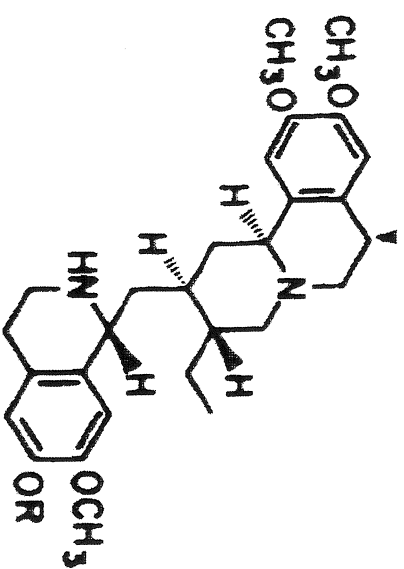


## Uses

- Ipecacunha is used as an
1. Expectorant
  2. Emetic
  3. In the treatment of amoebic dysentery

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Ipec

R = H, Cephaeline

R = CH<sub>3</sub>, Emetine

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## Uses

- Psychothrine and its O-methyl ether are selective inhibitors of human immunodeficiency virus.

## Uses

Emetine has a more expectorant and less emetic action than cephaline.

In the treatment of amoebic dysentery emetine hydrochloride is frequently given by injection, and emetine and bismuth iodide by mouth.

بذر اللحلاح وقرمه

## Colchicum seed and corm

- English name; autumn crocus or meadow saffron
- Latin name; *Colchicum autumnale*
- Family; Liliaceae
- Origin; Europe
- Used parts; seeds which are collected when ripe. They are globular in shape about 3 mm in diameter.

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## Phenethylisoquinoline Alkaloids

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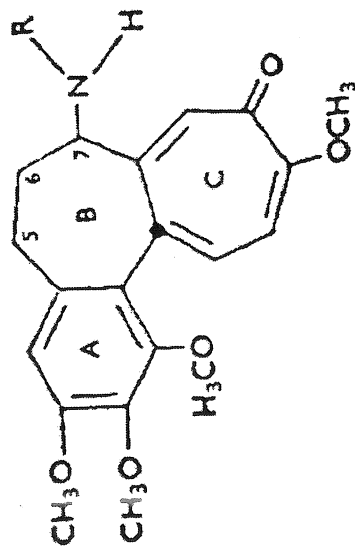
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## Colchicum seed and corm

- The seeds are extremely hard and have a reddish –brown, minutely pitted testea.
- During drying the seeds darken in colour and become covered with a sugary exudation.
- Colchicum seeds contain about 1.2% of colchicine, resin, fixed oil and reducing sugars.

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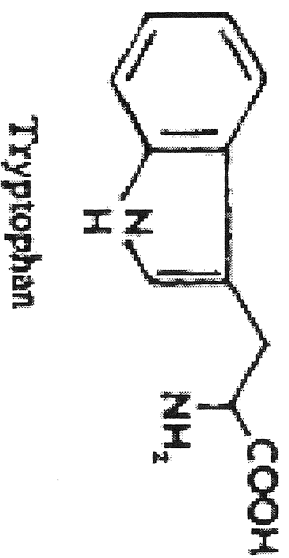
**R = CH<sub>3</sub>; Demecolcine**  
**R = COCH<sub>3</sub>; Colchicine**

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## Tryptophan-derived alkaloids



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## Uses

- Colchicum preparations are used to relieve gout القرص
- Colchicine is prescribed in tablet form and transdermal preparations
- The alkaloid is also used in biological experiments to produce multiplication of chromosomes in cell nucleus.

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## Macroscopical characters

- The drug consists entirely of sclerotia about 4 cm long and 7 mm broad; fusiform in shape and usually slightly curved.
- The outer surface is dark, violet-black colored.
- Ergot has a characteristic odour and an unpleasant taste.

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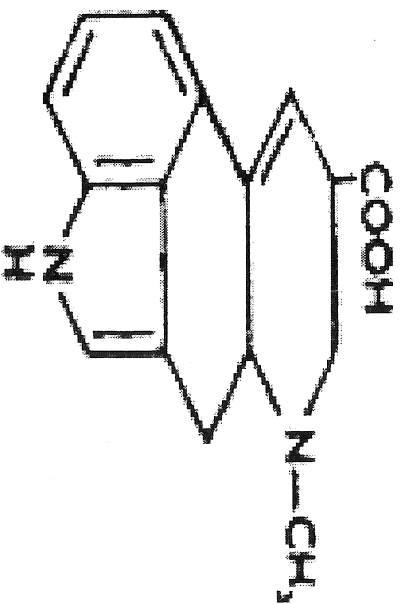
## Ergot and ergot alkaloids

### مهماز الشيلم

- Ergot , Ergot of rye, is the dried sclerotium of fungus, *Claviceps purpurea*, arising in the ovary of the rye, Secale cereal.. الشيلم (الجاودار)
- Family; Clavicipitaceae الفطور الزقية
- Origin; Europe
- Different selected strains of *C. purpurea* are used for the production of the alkaloids ergotamine, ergocristine or ergocormine and ergokryptine.

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**Lysergic acid**

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## Constituents

- The ergot alkaloids (ergolines) can be divided into two classes;
  1. The clavine type alkaloids dimethylergoline derivatives
  2. Lysergic acid derivatives (peptide alkaloids)

Each active alkaloid occurs with an inactive isomer involving isolysergic acid.

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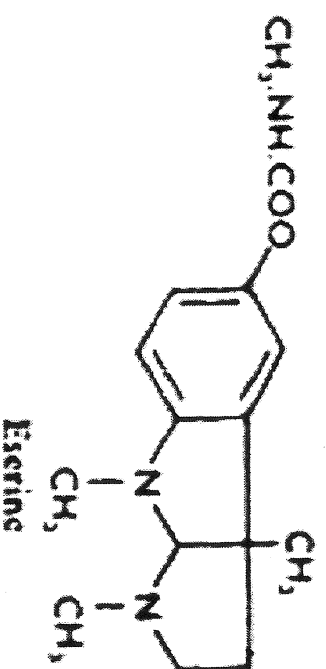
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## Calabar bean and physostigmine

- Latin name; *Physostigma venenosum*
- Family; Leguminosae, Papilionaceae
- Used parts; dried ripe seeds
- Calabar is a perennial woody climber
- Origin; west Africa

## Uses

- Ergometrine produce an oxytocic effect
- Ergotoxine and ergotamine have different action.
- Ergotamine and the semisynthetic dihydroergotamine salts are employed as specific analgesic for the treatment of migraine.
- Lysergic acid diethylamide (LSD-25), prepared by partial synthesis from lysergic acid, is a potent specific psychotomimetic.



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## Constituents

- The seeds contain the alkaloids phsostigmine or eserine, eseramine, geneserine, calabatine calabacine and others.
- The chief alkaloid, physostigmine 0.15% is derived from tryptophan. On exposure to air it oxidizes into a red compound, rubreserine. The official salt is more stable.

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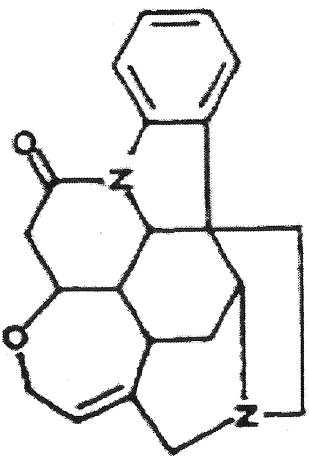
## Nux vomica

الجوز المقيء

- Latin name; Strychnos nux-vomica
- Family; Loganiaceae
- Used parts; dried ripe seeds
- A tree 10-13 m high
- Origin; east south Asia

## Uses

- Physostigmine salicylate is used for contracting the pupil of the eye.
- It used as injection to reverse the effect of sedatives.
- It is also useful in the treatment of Alzheimer.



**Strychnine**

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## Constituents

- 5% indole alkaloids strychnine (1.5%) and brucine (2%).
- Strychnine is physiologically much more active than brucine and the seeds are assayed for strychnine and not for total alkaloids.
- Chlorogenic acid
- Fixed oil.

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## Rauwolfia, Rauwolfia

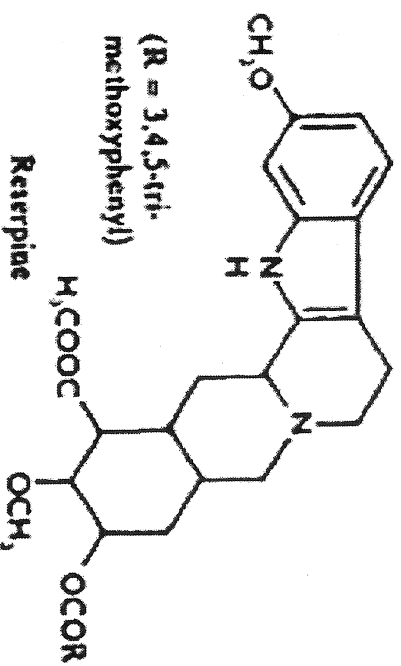
راولفيا

- Latin name; Rauwolfia (Rauwolfia) serpentina
- Family; Apocynaceae
- Rauwolfia is a small shrub
- Origin; east Asia

## Uses

- The alkaloid was formerly used as a circulatory stimulant in such cases as surgical shock.
- Now is used as stimulant of respiratory system in certain cases of poisoning.
- Strychnine improve the appetite and digestion





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## Constituents

- Rauwolfia contains about 30 alkaloids 2.4%.
- The chief therapeutically important alkaloids are reserpine and rescinnamine.
- These are esters derived from methyl reserpate and trimethoxybenzoic acid in the case of reserpine and trimethoxycinnamic acid in the case of rescinnamine.

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## Cinchona

- Latin name; *Cinchona succirubra*
- Used parts; The bark
- Family; Rubiaceae
- Origin; Latin America
- *Cinchona succirubra* is large tree

## Uses

- Rauwolfia preparations and reserpine are used in:
  1. the management of essential hypertension
  2. Certain neuropsychiatric disorders
  3. Ajmaline has pharmacological properties similar to those of quinidine and is marketed in Japan for the treatment of cardiac arrhythmias.

## Uses

- As bitter tonics and stomachics
- A decoction and acid infusion are sometimes used as gargales
- Quinine was the drug of choice for the treatment of malaria.

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## Constituents

- Cinchona bark contains quinoline alkaloids.
- The principal alkaloid are the stereoisomers quinine and quinidine, cinchonidine and cinchonine.
- The alkaloids present in combination with quinic acid and cinchotannic acid.
- Anthraquinones

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## Imidazole Alkaloids

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## Uses

- For the treatment of Plasmodium falciparum infections (falciparum malaria).
- Quinidine is employed for the prophylaxis of cardiac arrhythmias and for the treatment of arterial fibrillation; it also has antimalarial properties like quinine.

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## Constituents

- About 0.8% alkaloids, pilocarpine and others, Pilocarpine, the lactone of pilocarbic acid, contains a glyoxaline nucleus and with heat or alkalis isconverted into its isomer isopilocarpine.
- 0.5% volatile oil
- The dried leaves soon lose their activity on storage.

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## Jaborandi leaf and Pilocarpine

الجابور اندي و البيلو كار بين

- Latin name; Pilocarpus jaborandi, Pilocarpus microphyllus.
- Used parts; The leaves
- Origin; Brazil
- Family; Rutaceae

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## Purine Alkaloids

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## Uses

- Salts of pilocarpine are used in ophthalmic practice, as they cause contraction of the pupil of the eye.
- In early glaucoma treatment they serve to increase the irrigation of the eye and relieve pressure.

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## Constituents

- 3% Theobromine in the kernels, 0.4% caffeine
- 50% cocoa fat in the kernels

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## Cocoa seed

- Used parts; the seeds
- Latin name; theobroma cacao
- Family; Sterculiaceae
- Cocoa is a tree about 6 m high
- Origin; South and central America, west Africa

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## Mate leaf

- Latin name; *Ilex paraguensis*
- Family; Aquifoliaceae
- Origin; Latin America
- Used parts; the leaves
- Mate is small tree or shrub

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## Uses

- Cocoa has nutritive, stimulant and diuretic properties.
- Theobromine is used as a diuretic
- Theobromine has less action on the central nervous system than caffeine but is more diuretic.
- Oil of theobroma is used in pharmacy as a suppository base.

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## Hemlock fruit

الشوكران

- Latin name; *Conium maculatum*
- Family; Umbelliferae, Apiaceae المظلية
- Origin; Europe
- Used parts; dried unripe fruits
- Spotted hemlock is a poisonous biennial plant

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## Constituents and uses

- Mate leaves contain about 2% of caffeine, 16% of chlorogenic acid
- Mate leaves are used as tea

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## Terpenoid Alkaloids

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## Constituents and uses

- Alkaloids about 2.5% , coniine
- Coniine is volatile alkaloid
- The drug and its alkaloids are used as poison.

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## Constituents and uses

- Aconite contains terpene ester alkaloids, of which most important is aconitine 1.2%.
- It was used as sedative in the treatment of nervous pains.
- Aconite is very potent and quick-acting poison

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خانق الذئب

## Aconite root

- Latin name; *Aconitum napellus*
- Family; Ranunculaceae الحوذانية
- Origin; Europe
- Used parts; dried roots

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## Veratrum

- American veratrum is called also Green Hellebore .
- Latin name; *Veratrum viride*, *Veratrum album*
- family: Liliaceae
- Perennial herbs.
- Part used: rhizomes

## Steroid Alkaloids

- Steroidal alkaloids arise by the inclusion of a basic nitrogen at some point in the steroid molecule.
- Those of the C27 group include the *Solanum* alkaloids and *Veratrum* alkaloids

## Uses

- American veratrum is used for the preparation of Veriloid, a mixture of the hypotensive alkaloids.
- European veratrum is used for the preparation of the protoveratines.
- Both drugs, and the closely related cevadilla seeds (*Schoenocaulon officinale*), are used as insecticides.

## Constituents of Veratrum

- Numerous steroidal alkaloids are present in both *V. album* and *V. viride*.
- There are two distinct chemical groups of veratrum steroidal alkaloids and these are now referred to as the jerveratrum and ceveratrum groups.

## Role of plants in cancer treatment

- Plant materials have been used in the treatment of malignant diseases.
- A comprehensive survey of literature describing plants used against cancer listed over 1400 genera.

## Tumour inhibitors from plants

- The main forms of treatment for cancer in humans are surgery, radiation and drugs (cancer chemotherapeutic agents).
- Cancer chemotherapeutic agents can often provide temporary relief of symptoms, the prolongation of life, and occasionally cures.

## Catharanthus roseus

- E. N. Madagascan periwinkle
- L. N. *Catharanthus roseus*
- *Vinca rosea*

## Plant used as anti cancer drug

- Podophyllum hexandrum (Lignans and their glycosides)
- Solanum dulcamara (the expressed juice, solamarine)
- Lichens such as Cladonia, Cetraria and Usnea (usnic acid).
- Mistletoe (*Viscum album*)
- Mezeoreon (*Daphne mezereum*)
- *Catharanthus roseus* (vinblastine, vincristine).