

Hydrastine

- Found in the roots and rhizomes of *Hydrastis canadensis* (family: **Ranunculaceae**).

Uses:

- To control **uterine hemorrhage**.
- **Traditional use of this root as:**
 - 1. Tonic** {a medicine that strengthens}.
 - 2. Uterine hemorrhage.**
 - 3. Catarrhal conditions.**



Berberine:

- From **Berberidaceae** البرباريسية (**Berberies** species) and **Ranunculaceae** الفصيلة الحوذانية (**Hydrastis**).
- Used as antiemetic, antibacterial and anti-inflammatory.
- Also, it is used for liver diseases.



Sanguinarine:

- From the **roots** of *Sanguinaria canadensis* دموية (blood root) {Family **Papaveraceae**}.
- Native to America.
- Its effect resembles colchicine, i.e. causes doubling of chromosomes number (polyploidy).
- Used for atonic dyspepsia with hepatic symptoms.

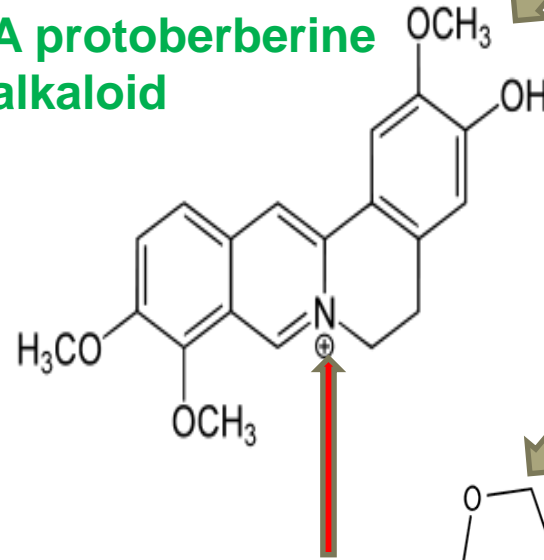
عسر الهضم

Benefits:

Antifungal,
antibacterial,
Antidiabetic,
antiinflammatory.

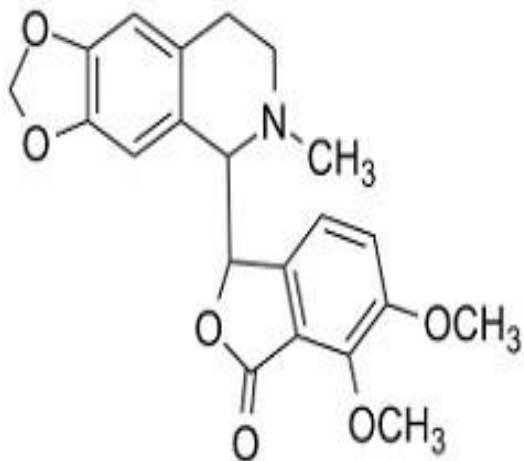
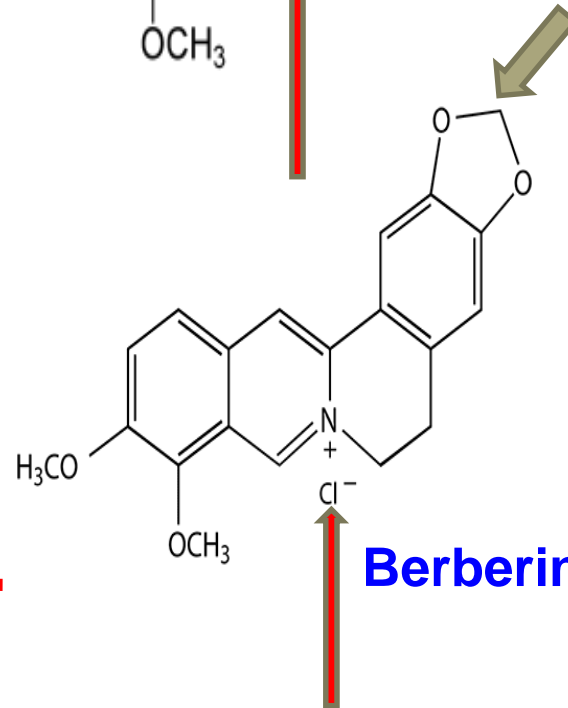
Jatrorrhizine

A protoberberine
alkaloid



Berberine

A quaternary amine
alkaloid.

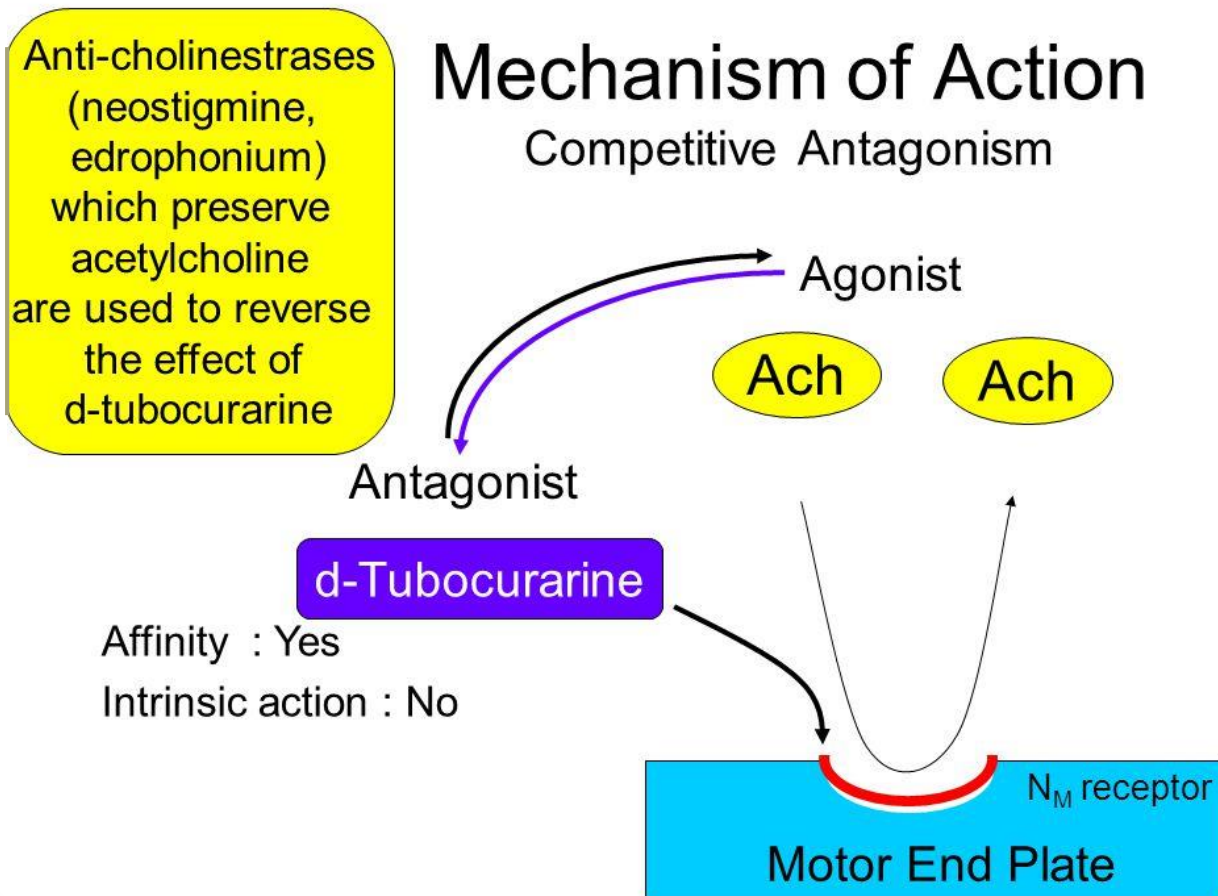


Hydrastine

Curare alkaloids:

- **Bis-benzylisoquinoline.**
- obtained from the bark and stems of *Chondrodendrum tomentosum* (family: *Menispermaceae*).
- The name is derived from “urari”; an Indian word indicating “poison”.
- The term “**curare**” is used to indicate the crude extract prepared from different species.
- Was used by certain natives of the Amazon regions of South America as arrow poison. Some of these extracts were poisonous by virtue of a convulsant action and others by paralyzing action (Most remarkable).

Mechanism of action of *d*-tubocurarine



- Curare possesses:
 1. A paralyzing effect on voluntary muscles.
 2. A toxic effect on blood vessels.
 3. A histamine-like effect.
 - Most of the activity is attributed to **α -tubocurarine**.

Uses:

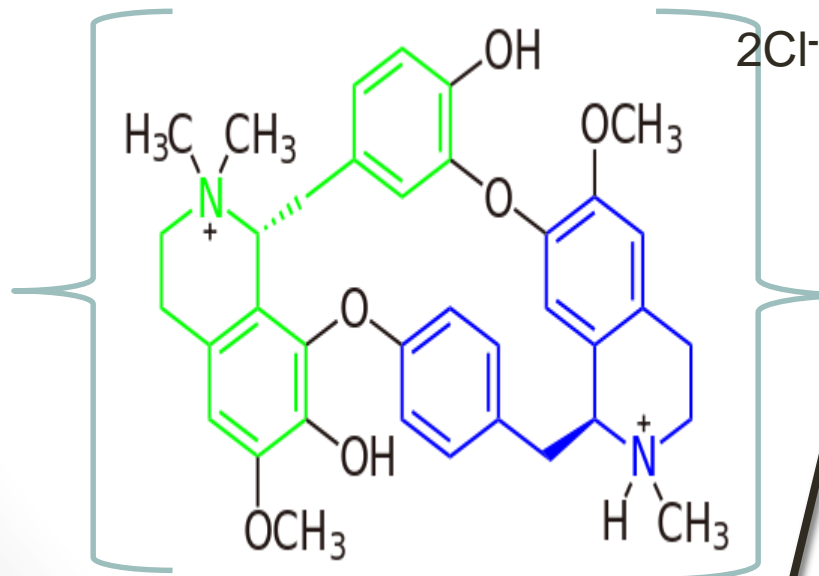
- 1- In **surgical anesthesia**, as it produces muscular relaxation without deep anesthesia.
- 2- After **shock treatment** (in mental diseases) as it reduces convulsions.
- 3- To control convulsions after **strychnine** poisoning (**Strychnine increases excitability**)

Toxiferine: is a curare toxin.

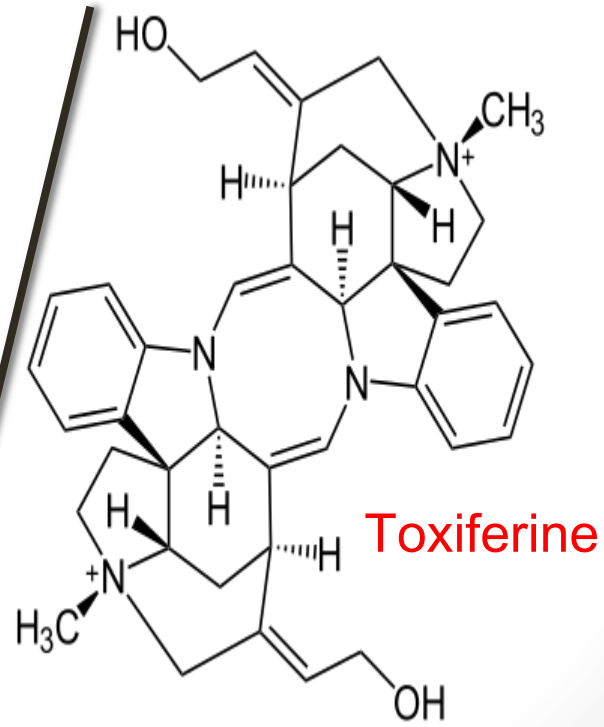
It is a bisindole alkaloid derived from

Strychnos toxifera and a

nicotinic acetylcholine receptor antagonist.



Tubocurarine

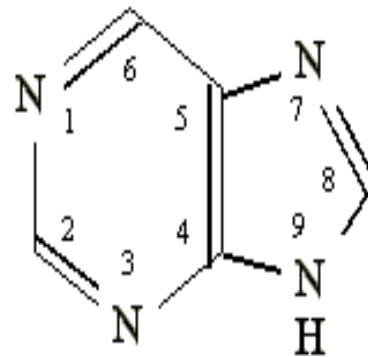


Toxiferine :

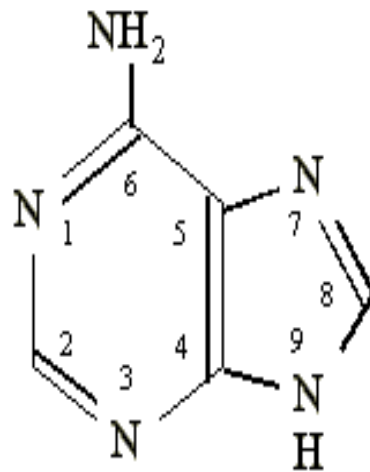
- Is a curare toxin.
- It is a **bisindole** alkaloid derived from *Strychnos toxifera*.
- It is a nicotinic acetylcholine receptor antagonist.
- Therefore, it is a muscle relaxant that causes the paralysis of the skeletal muscles.



Purine Base Alkaloids:

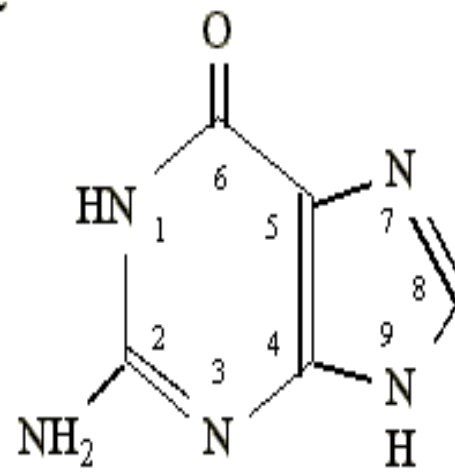


Purine



Adenine

135.1 gm/mol

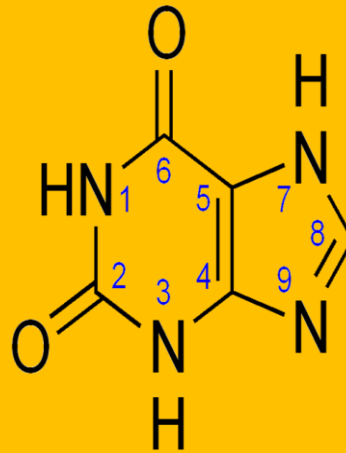


Guanine

151.1 gm/mol

- The most important alkaloids in this group are the alkaloids derived from the **xanthine** nucleus (oxidized purine), and these are:

1. Caffeine.
2. Theobromine.
3. Theophylline.



Botanical source:

1. *Cola nitida* (from **coat of seeds**).
2. *Thea sinensis* or *Camellia sinensis* (from **leaves**).
3. *Coffea arabica* (from **seeds**).
4. *Guarana* (from **seeds**).
5. *Theobroma cacao* (from **seeds**).



Cola nut = Kola=Cola= *Cola nitida*



Camellia sinensis



Coffea arabica

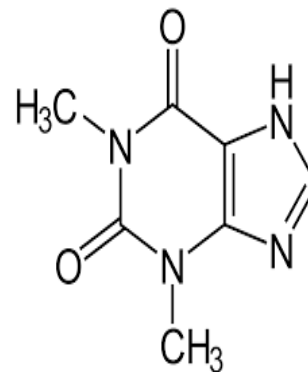
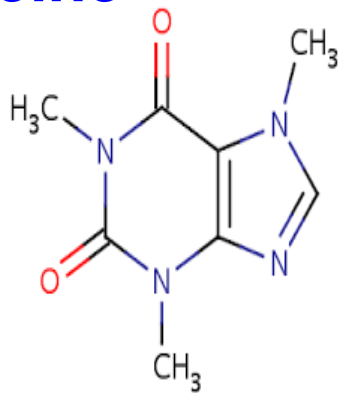


Guarana



Theobroma cacao

Caffeine

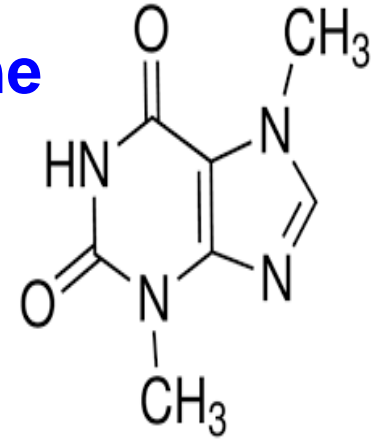


Theophylline

Caffeine



Theobromine



PHARMACOLOGY:

1. CNS stimulant.
2. Smooth Muscle relaxant.

For **cardiac edema** and **angiana pectoris**
(**because of the diuretic and**
vasodialting effects, especially for
theobromine).

Terpenoid alkaloids:

= are most simplistically described as aminated **terpenes** or even “azaterpenes

Aconitine (20 carbons)

Atisine (18 carbons)

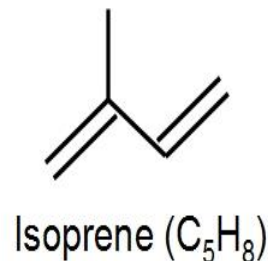
Viaticine

Terpenoids

Any of a large class of organic compounds including terpenes, diterpenes, and sesquiterpenes. They have unsaturated molecules composed of linked isoprene units, generally having the formula $(C_5H_8)_n$.

Terpenes - classification:

- | | |
|-------------------------------|--------------|
| • monoterpenes (C_{10}) | 2 x isoprene |
| • sesquiterpenes (C_{15}) | 3 x isopren- |
| • diterpenes (C_{20}) | 4 x isopren |
| • triterpenes (C_{30}) | 6 x isopren |
| • tetraterpenes (C_{40}) | 8 x isopren |



- formed by bonding „head to tail“ or „tail to tail“
- different degree of unsaturation
- variety of functional groups

Aconite root:

- The alkaloids (**1. 20 carbon atoms**) of this group is found mainly in species of *Aconitum* البيش and *Delphinium* العائق (**Ranunculaceae**).
- The alkaloids are **aconiine** and **aconitine** from the tuber of *Aconitum napellus*.
- Aconite is known to be the most poisonous plant, 10 gms can kill an adult.



Tuber

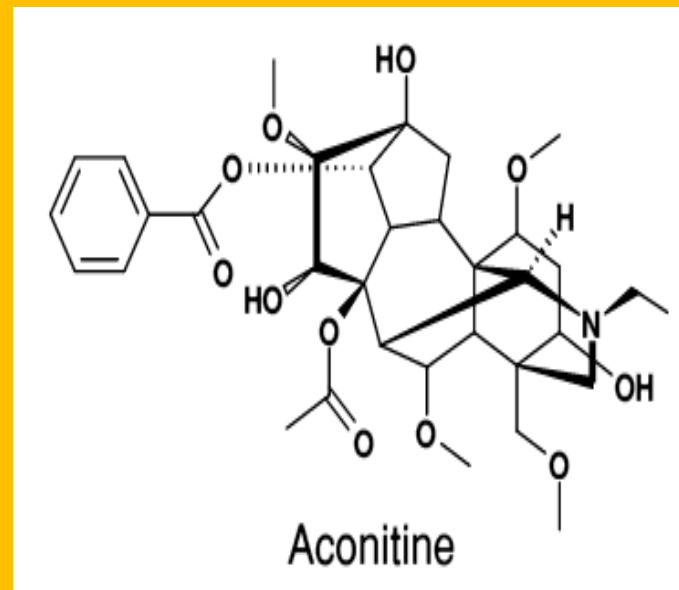


Aconitum napellus



The drug **was** used in the treatment:

1. Neuralgia [(a stabbing, burning, and often quite severe pain that occurs along a damaged nerve)]
2. Rheumatism.
3. Gout.
4. Hypertension.
5. Anti-inflammatory.
6. Antipyretic.
7. Analgesic.
8. Local anesthetic.



Toxicity

- At the toxic doses, the victim feels tingling in the lips, the tongue, the throat, then the face and limbs. Anguish (**كرب** **غم**, **Hardship, misery, suffering**), dizziness, myasthenic **واهن العضل**, numbness, chills, rashes and diarrhea as well as cardiac system alterations.
- Death occurs by **respiratory arrest** while the subject remains fully conscious, (similar to coniine toxicity of *Conium maculatum*).
- **Aconitum** : herbaceous perennial plants are chiefly native to the mountainous parts of the northern hemisphere.

Delphinium:

- Is a genus of about 300 species of perennial flowering plants in the family **Ranunculaceae**, native throughout the Northern Hemisphere and also on the high mountains of tropical Africa.
- All members of the *Delphinium* genus are toxic to humans and livestock.
- Death is through **cardiotoxic** and **neuromuscular blocking** effects, and can occur within a few hours of ingestion.
- All parts of the plant contain various **diterpenoid** alkaloids, typified (represented or symbolized) by **methylycaconitine**, so they are very poisonous.



2. Alkaloids with C-19 carbon atoms:

- ❖ Atisine and viaticine.
- ❖ Diterpene alkaloids.
- ❖ These are less toxic than aconite alkaloids.



Annona squamosa
القشطة الصدفية

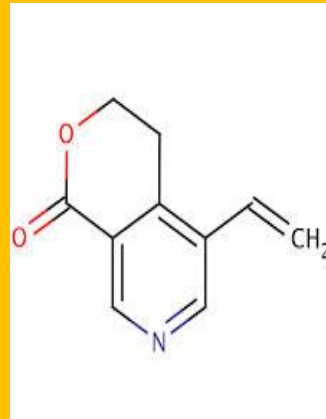
Monoterpene alkaloids

➤ **Gentianine:**

➤ This alkaloid is found in *Gentiana* species الكوشاد أو الكوشد

Pharmacological effects:


1. CNS stimulant.
2. Hypotensive.
3. Anti-inflammatory.
4. Muscle relaxant.
5. Tonic (strengthening and refreshing
6. effect).



References

- Pharmacognosy Trease and Evans. 16th Edition, 2009, Published by ELBS, London ISBN 978-0702029332.
- Drugs of Natural Origin, 7th edition 2015 Gunnar Samuelsson. Swedish Pharmaceutical Press , ISBN 978—91-980942-5-1

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THE END

Thankyou...

Dr. YousefAbusamra