

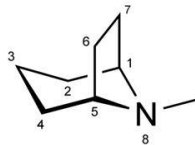
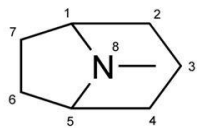


## Lab. 4

# Tropane Alkaloids

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## Tropane Alkaloids



Tropane ring system

- Class of alkaloids that contain a tropane ring system in their chemical structure.
- Naturally produced in plants of the family *Solanaceae*.
- Tropane alkaloids biologically perform one of two functions:
  1. Anticholinergics (blocks the activity of acetylcholine)
  2. Stimulants



o **Datura stramonium:**

- o Datura stramonium known by the **common names** Jimson weed or datura, is a plant in the **Solanaceae** (**nightshade**) family.
- o For centuries, datura has been used as a **herbal medicine** to relieve **asthma** symptoms and as an **analgesic** during surgery or bone setting.
- o It is also a powerful **hallucinogen** and **deliriant**, which is used spiritually for the intense **visions** it produces.
- o However, the **tropane alkaloids** which are responsible for both the medicinal and hallucinogenic properties are fatally toxic in only slightly higher amounts than the medicinal dosage, and careless use often results in hospitalizations and deaths.

**Constituents of datura are:**

- o **Hyoscyamine** and its isomer **atropine**, which is formed during extraction procedure. Also it contains **hyoscine** (scopolamine) alkaloid, which is found in trace amounts.
- o The medicinal use is mostly due to the **hyoscyamine** (atropine), used as **mydriatic**, **antispasmodic**, **antidote** to the toxicity of **cholinergic** compound, decrease in the secretion (upper and lower respiratory tract) before surgery.
- o While the use of **scopolamine** mostly in **motion sickness**.



## Buscopan Tablets

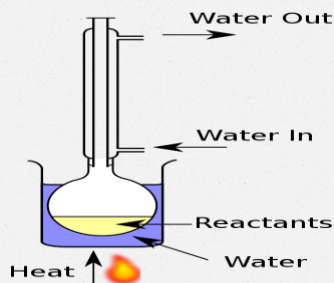
Buscopan is an anticholinergic medicine which relieves the pain of stomach and bowel cramps by helping your digestive system to relax. Each Buscopan tablet contains 10 mg of Hyoscine Butylbromide. It is also available as Buscopan Plus which contains Paracetamol 500 mg and Hyoscine Butylbromide 10 mg.

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- o **Isolation and Identification of the Datura Alkaloids:**
- o **Extraction:**
- o **Aim:** to isolate datura alkaloids.
- o **Equipments:**
- o *Reflex apparatus, Conical flasks, Stirrer, Funnel, Separatory funnel, Water bath, Filter paper, Litmus paper.*



## Reagents:

- o 90% ethanol.
- o 2% HCl.
- o Ammonium hydroxide solution.
- o Chloroform.

### Procedure:

- o Extract **50 gm** of the datura fruits in **150 ml** of 90% ethanol under Reflex condenser for **1 hrs.**

Filtration

Take **20 ml** of alc. Extract in conical flask and concentrate on the water bath to about **2 ml** to remove all of ethanol

Pour the concentrated in to **10 ml** of 2% HCl

Heat gently  
(**5 min.**)

Cool and filter the Acidic extract and place in a separatory funnel

[Wash with **5 ml** of Chloroform] two times

- o Take supernatant (upper layer) and made alkaline by addition of Ammonium hydroxide solution (check by litmus paper)
- o [Partition with 5 ml of Chloroform] two times
- o Take the lower layer, dehydrate by adding anhydrous sod. Sulphate filter (or decant) , evaporate to dryness.

## 2. Results:

- o Product containing the mixture of the alkaloids.
- o The Identification of Datura Alkaloids:
- o **Qualitative Analysis:**
- o A.The specific tests for tropane alkaloids (**Gerhard test**):
- o Add 2% HgCl<sub>2</sub> in 50% aqueous ethanol to 0.0006 g of atropine. **Result : A deep red color will be developed.**

## B. Identification of Datura Alkaloids By Chromatography:

- o  By the use of thin layer chromatography (T.L.C)
- o  The stationary phase = Silica gel G.
- o  The mobile phase = Butanone: Methanol: Ammonia (60:70:10) Or Acetone: Water: Ammonia (90:7:3).
- o  The standard compound = atropine or hyoscine.
- o  The spray reagent = Dragendorff's reagent.
- o  Mechanism of separation = Adsorption.
- o  Developing = Ascending.

### Procedure:

- o 1) Prepare 100ml of mobile phase, and place it in the glass tank.
- o 2) Cover the tank with glass lid and allow standing for 45 minutes before use.
- o 3) Apply the sample and the standard spots on the silica gel plates, on the base line by the use of capillary tube.
- o 4) Put the silica gel plate in the glass tank and allow the mobile phase to rise to about two-third the plate.
- o 5) Remove the plate from the tank, and allow drying, and then spray with the spraying reagent.



