

STUDY MATERIAL

TOPIC : FAMILY SOLANACEAE

CLASS - B.Sc. (BOTANY) II YEAR

PAPER - I

UNIT - II

&

CLASS - M. Sc. (BOTANY) II SEM

PAPER - I

UNIT - III

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SOLANACEAE

CLASSIFICATION

Bentham & Hooker
(1862-83)

Phanerogams
Dicotyledons
Gamopetalae
Bicarpellatae
Polymoniales
Solanaceae
Datura alba

Hutchinson's
(1959)

Angiosperm
Dicotyledonae
Herbaceae
Solanales
Solanaceae
Datura alba



CLASSIFICATION WITH IDENTIFICATION

Division - Phanerogames

- These are flowering plants.
- The plant body is divided into distinct root, shoot and leaves.

Group - Dicotyledons

- Two cotyledons present.
- Leaf veins reticulated venation.

Class - Gamopetalae

- Flowers with distinct calyx and corolla.
- The petals are joined together in the corolla.

Series - Bicarpellatae

- Flower with petals fused with the calyx and corolla with a superior ovary.
- Two carpels present.

Order - Polemoniales

- A cohort of gamopetalous plant characterized by a regular corolla with five lobes and five alternate stamens.
- Flowers are bisexual.

Family - Solanaceae

- Axile placentation.
- Ovaries 1 to 5 superior and obliquely located

Genus - *Datura*

- Gynoecium is bicarpellary.
- Stamens are epipetalous.

Species - *alba*

- Sepals are gamosepalous.
- Petals are gamopetalous.



DISTRIBUTION

- The members of this family are primarily distributed in tropical America and South America but they are also well represented in temperate region.
- The solanaceae family consist of about 98 genera and some 2700 species with a great diversity of habitats morphology and ecology.
- The largest genus of the family is *Solanum* .
- Which includes about 1700 species.
- The name solanaceae drived from the genus *Solanum*. "the nightshade plant".



FAMILY CHARACTERS

- The flowers are bellshaped and complete.
- Flowers are actinomorphic and pentamerous.
- Calyx persistent and gamosepalous.
- Corolla gamopetalous and campanulate.
- Androecium epipetalous and basifixed.
- Gynoecium bicarpellary, syncarpous, bilocular.
- Ovary 1 to 5 superior and obliquely located.
- Axile type placentation
- Fruit is capsule or Berry.



IMPORTANT GENERA

- *Solanum*
- *Lycopersicum*
- *Capsicum*
- *Nicotiana*
- *Datura*
- *Withania*
- *Cestrum*
- *Petunia*
- *Atropa*
- *Hyosayamus*

Datura alba

● **VEGETATIVE CHARACTERS:-**

- **Habit**:- Annual, wild herb.
- **Root**:- Tap root system.
- **Stem**:- Aerial ,erect ,branched,cylindrical ,hairy.
- **Leaf**:-Exstipulate ,petiolate ,simple ,alternate, ovate,acute,unicostate reticulate venation.

● **FLORAL CHARACTERS:-**

- **Inflorescence:-** Solitary axillary
- **Flower:-** Ebracteate ,Pedicellate, bisexual, Complete, actinomorphic, hypogynous, Pentamerous
- **Calyx:-** Number of sepals:5,gemosepalous,Persistent, valvate aestivation, green colour
- **Corolla:-** Number of petals 5,gamopetalous, Infundibuliform, valvate aestivation,white colours.

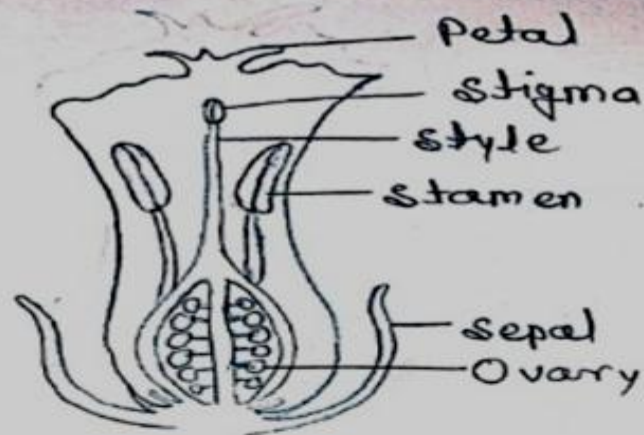
● FLORAL CHARACTERS:-

- Androecium:- Number of stamens: 5, polyandrous, epipetalous, ditheous, basifixed.
- Gynoecium:- Bicarpellary, syncarpous, ovary superier bilocular (sometimes become tetralocular due to false septation, axile placentation, carpels placed obliquely in the flowers, single style, stigma bilobed and capitute.
- Fruit:- Capsule Seed:- Endospermic

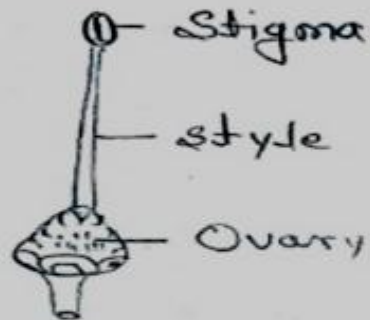
Datura alba



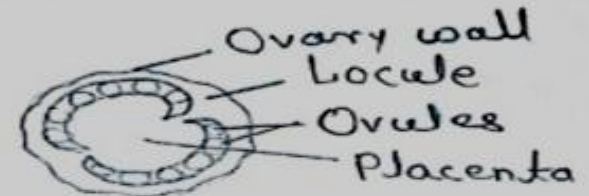
A Flowering twig



L.S. of Flower



Gynoecium



T.S. OF Ovary



Floral Diagram - *Datura alba*.

Floral Formula: $EB\gamma, \oplus, \text{♀}, K_{(5)}, \overline{C_{(5)}}, A_5, \underline{G_{(2)}}$

- The family is of great economic importance and includes many plants that furnish foods and drugs and species that are highly decorative as well as numerous poisonous plants.
- Ornamental plants :- *Petunia, Lycium, Nicotiana, Solandra*
- Drug -yeliding plants:- *Atropa belladonna, Withania somnifera, Nicotiana tabacum, Dutura alba, etc*
- Food yeliding plants:- *Solanum tuberosum, Solanum melongena, Lycopersicum, Capsicum annum, etc*

ECONOMICALLY IMPORTANT PLANTS OF SOLANACEAE

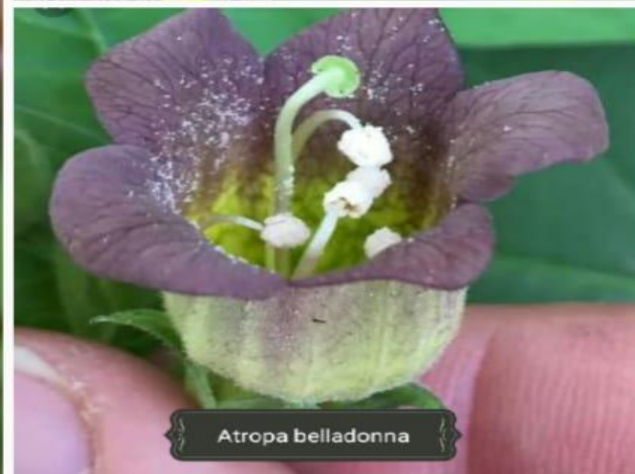
S No	Common name	Botanical name
1.	Tabacco	<i>Nicotiana tabacum</i>
2.	Potato	<i>Solanum tuberosum</i>
3.	Brinjal	<i>Solanum melongena</i>
4.	Lal mirch	<i>Capsicum annuum</i>
5.	Tomato	<i>Lycopersicum esculentum</i>
6.	Belladona	<i>Atropa belladona</i>
7.	Gooseberry	<i>Physalis peruviana</i>
8.	Datura	<i>Datura alba</i>
9.	Ashwagandha	<i>Withania somnifera</i>
10.	Queen of the night	<i>Cestrum nocturnum</i>
11.	Henbane	<i>Hyoscyamus niger</i>



• Solanum tuberosum •



Lycopersicum



Atropa belladonna



Capsicum annuum



Datura alba



Solanum melongena



AFFINITY OF FAMILY SOLANACEAE

- Allied to Scrophulariaceae but distinguished by the form of the corolla, number of stamens and oblique position of carpels. Differs from Convolvulaceae in having numerous seeds
- According to Engler it occupies a position under order Tubiflorae in the subseries
- Hutchinson considers it related to Convolvulaceae and Boraginaceae.
- Wettstein accepts it is closely associated with Convolvulaceae, that is why he has put the family under Tubiflorae
- Rendle is of opinion that the family Solanaceae be placed under Tubiflorae.
- Hallier considers it as a primitive member of the Tubiflorae and has derived from Linaceae



THANK YOU