

## PUC I YEAR SEMESTER-II

### UNIT–V. PLANT SYSTEMATICS

#### Module 27: DESCRIPTION OF LILIACEAE

##### **FAMILY LILIACEAE**

The family Liliaceae belongs to monocotyledons and order liliales. It is commonly called '**Lily' family**. The members show worldwide distribution. They are mainly ornamental plants, but include vegetables (Onion, Garlic) and Asparagus, and some species have been used medicinally. Approximately 250 genera and 4550 species are known, of which 200 are found in India.

**IMPORTANT PLANTS:** Some of the important plants of the family Liliaceae are *Allium cepa*, *Allium sativum*, *Allium vineale*, *Gloriosa superb*, *Asparagus racemosus*, *Fritillaria*, *Tulips*, *Aloe barbadensis*, *Scilla*, *Smilax*, *Yucca*, *Dracaena*.

##### **DISTRIBUTION**

It is found in both temperate and **subtropical** zones.

**Habit** – Annual, biennial, perennial herbs and shrubs, but there are also evergreen succulents (*Aloe*) and woody evergreen climbers (*Lapageria*). Plants mostly herbaceous with perennating **rhizome** or bulb, a few climbers (*Asparagus* and *Smilax*), *Yucca* and *Aloe* are xerophytic.



## VEGETATIVE CHARACTERS

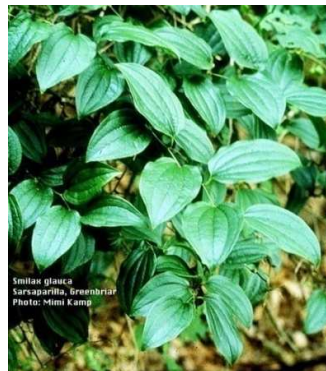
**Roots-** They are fibrous, tuberous in *Asparagus*. Many members of the family are perennial and have storage organs such as rhizomes.

**Stem** – Solid or fistular, underground as bulbs or starchy rhizomes or corm. The long stalk like peduncle that emerges from the underground stem is known as **scape**. This develops inflorescence. Stem may be modified into bulbs (onion, garlic), rhizome (*Gloriosa*) or a corm (*Colchicum*).

**Leaf** – The leaves of this family are usually long, thin, simple, radical or cauline, exstipulate, alternate, opposite or whorled, sessile or pedicellate, mostly parallel venation but reticulate venation in *Smilax*. The leaves are reduced to minute scales (cladode) in *Asparagus*. The leaf is modified into tendril for climbing in *Gloriosa superba*. In extreme cases, they have are scales (*Asparagus*) or modified into **tendrils** (*Gloriosa*).



*Gloriosa* Modified leaves



Reticulate venation in *Smilax*

## FLORAL CHARACTERS

**Inflorescence** – The flowers are often borne in racemes. Some are in **cymose** or **umbel** and others they may also be **solitary** as in the Tulip.

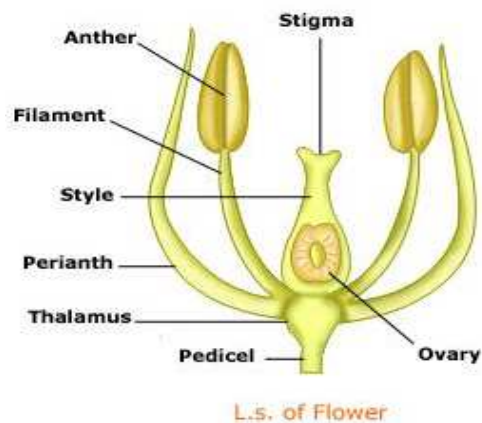


Umbel inflorescence in Onion



Solitary inflorescence in  
the Tulip

**Flower** – the flowers are usually bracteate, ebracteolate, pedicellate, actinomorphic, complete, bisexual, homochlamydeous, Trimerous and hypogynous. Exceptionally flowers are unisexual in *Ruscus* and *Smilax*.



**Perianth**- They are called **tepals**. The perianth typically consists of two whorls of undifferentiated or weakly differentiated petaloid tepals with 3 distinct members in each whorl. Valvate aestivation.



Tepals in *Lilium*

**Androecium** – The **androecium** usually consists of 6 fertile stamens attached to the receptacle or adnate to the perianth. Stamens are arranged in two whorls, epiphyllous and opposite to perianth lobes. Filaments long, anthers ditheous, introse, versatile or basifixed.



Androecium of White Lily (*Lilium candidum*)

**Gynoecium** – Tricarpellary, syncarpous, superior ovary, trilocular, many ovules on axile **placentation**, style single and stigma trilobed.



**Fruit** – Berry (*Asparagus*, *Clintonia*) or capsule (*Lilium*, *Fritillaria*).



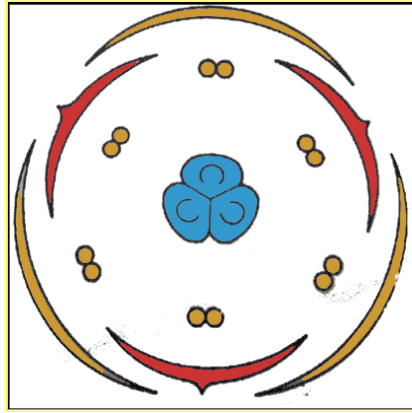
Capsule



Berry

**Seed** – Endospermic.

**Floral formula** - Br  $\oplus$   $\frac{\text{♀}}{\text{♂}}$   $P_{3+3}$   $A_{3+3}$   $G_{(3)-}$



Floral Diagram

### ECONOMIC IMPORTANCE

1. *Allium cepa* (onion), *Allium sativum* (garlic), *Asparagus* (shatavari) are edible.
2. *Smilax*, *Aloe*, *Gloriosa*, *Colchicum* (It is used to obtain chemical mutagen colchicine), *Scilla* are used in preparation of drugs.
3. Aloin is obtained from *Aloe vera*, which is a **purgative**.
4. *Urginea* and *Scilla* yield rat poison.
5. Tonic is obtained from *Asparagus* (shatavari)
6. *Yucca Gloriosa*, *Phormium tenax* yield fibers.
7. *Dracaena* and *Xanthorrhoea* yield resin. It is used for preparation of sealing wax.
8. *Lilium*, *Gloriosa*, *Ruscus*, *Asparagus* are used as garden plants.

### CHECK POINTS

- The plants are mostly herbs with perennating rhizome or bulb.
- Roots are fibrous rarely **tuberous**.
- Simple leaves, exstipulate, parallel venation.

- Inflorescence racemose or cymose or umbel.
- Flowers trimerous with less distinguished sepals and petals and hypogynous.
- Androecium stamens 6 with long filaments.
- Gynoecium tricarpellary, syncarpous, trilocular, axile placentation.

### Short Answer Questions

1. Give a brief account of the floral parts of Liliaceae.
2. Write an account of the essential organs of the flower of Liliaceae.
3. Write the general floral formula for the family Liliaceae.
4. Give an account of the economic importance of the plants belonging to the family Liliaceae.
5. What are the characters of nonessential parts of the flower?
6. Give the characters of leaf of Liliaceae.
7. What type of modification you find in *Asparagus* plant.

### Long answer questions

1. Give an account of the characters of the family Liliaceae. Add a note on its economic importance.

### MCQS

1. Parallel venation is characteristic of
  - a. **Onion**
  - b. Chilli
  - c. Potato
  - d. Night queen
2. In Liliaceae, the gynoecium is
  - a. Bicarpellary
  - b. **Tricarpellary**

- c. Unicarpellary
  - d. Multicarpellary
3. The flowers of Liliaceae are mostly
- a. Bimerous
  - b. Trimerous**
  - c. Tetramerous
  - d. Pentamerous
4. The position of ovary in the family Liliaceae is
- a. Hypogynous
  - b. Epigynous**
  - c. Perigynous
  - d. Absent
5. Which of the following statement is correct to describe the flowers of Liliaceae
- a. Ovary trilocular with many ovules**
  - b. Ovary trilocular with three ovules
  - c. Ovary bilocular with many ovules
  - d. Ovary pentalocular with many ovules
6. The leaves of *Gloriosa superba* showing modification for
- a. Protection
  - b. Storage
  - c. Climbing**
  - d. reproduction
7. The floral characters of Liliaceae are different from solanaceae in having:
- a. Pentamerous flowers and apocarpous condition
  - b. Tricarpellary apocarpous condition

- c. Simple leaves and tricarpeal ovary**
  - d. Epipetalous stamens and dithecous anthers
- 8. The position of the gynoecium and number of carpels in Onion is
  - a. Superior and 5
  - b. Inferior and 3
  - c. Superior and 3**
  - d. Inferior and 5
- 9. The stem of garlic is modified into
  - a. Phylloclade
  - b. Bulb**
  - c. Corm
  - d. Scale
- 10. The stigma of Liliaceae plants has how many lobe(s) more than solanaceae member?
  - a. One**
  - b. Two
  - c. Three
  - d. Four