

## Practical 6

# IDENTIFICATION OF INDOOR AND OUTDOOR FOLIAGE ORNAMENTALS, CACTI-SUCCULENTS AND BULBOUS PLANTS

### Introduction:

Different indoor and outdoor foliage plants are identified based upon the knowledge of morphology and anatomy. For describing indoor and outdoor foliage plant, every part of it is to be studied in detail and compared with similar structures of other plant. Every plant part has a name and its study is called as **Phytography**. It is a branch of taxonomy or plant systematic. It deals with the descriptions of plants and their organs (parts). The main plant parts used for description of flowering plants are given below:

- Roots (position and morphology)
- Stem (Branching pattern, texture, shape, bark-surface, form, modifications, etc.)
- Buds (position, protectiveness, time of sprouting, etc.)
- Foliage (Leaf-simple/ compound, insertion, arrangement, parts, stalk, base, apex, shape, serration/ margins, incision, venation, surface/ texture, sap, duration, etc.)
- Inflorescence (type, size and number of flowers, duration, etc.)
- Flowers (shape, symmetry, completeness, parts, arrangement, insertion, union of floral parts, calyx- sepals, corolla- petals/ tepals, colour, shape, size, androecium- stamens, anthers, gynoecium- stigma, style, ovary, fragrance, duration, etc.)
- Fruits (type, shape, size, colour, fragrance, duration, etc.)
- Ovule/ Seed (shape, size, colour, number, duration, etc.)

## **EXERCISE 6.1:**

### **IDENTIFICATION OF MAJOR INDOOR FOLIAGE PLANTS**

#### **Objective :**

- To identify various foliage/ house plants based on primary morphological characters.

**Delivery schedule :** 1 period

#### **Student's expectations/ Learning objectives:**

- To get acquaint with different foliage/ house plants grown in India

**Pre-learning required :** Knowledge about various foliage plants.

**Handouts/material required/equipment's & tools:** Foliage/ house plants, hand lens and standard encyclopedia and books on Floriculture

#### **Introduction:**

Indoor gardening is the art of growing and arranging plants indoor or in the house for its best use for function and/ or beauty. The purposes of growing live/ indoor/ house- plants are given below:

- Primitive ways to cultivate ornamentals
- Exceptional value in interior decoration
- Cultivation for desired satisfaction
- Sense of interest for recreation
- Source of exercising gardening adventures
- To reduce expenditure on wide open areas outside the houses, since population density is increasing at alarming rate in urban areas
- Plants used to divide indoor living areas
- Brings permanence in the house

#### **Major qualities of indoor plants:**

- Robust (ability to tolerate hot, cold or dryer conditions inside the house)

- Evergreen
- Attractiveness

## Description of indoor foliage plants

## Photograph

### ***Aglaonema commutatum* (Aglaonema)**

Family: *Araceae*

Leaves are many, small to medium, ovate-lanceolate, broad, grayish-green irregular bands very prominent.



### ***Aglaonema modestum* (Chinese evergreen)**

Family: *Araceae*

Leaves elliptic, acuminate, green to dark green and branches freely.



### ***Asparagus plumosus* (Asparagus fern)**

Family: *Liliaceae*

A fine foliage climber with dark green foliage arranged in one plane, triangular in outline and cladodes numerous in fascicles. Flowers are small, white and berries are black.



### ***Asparagus sprengeri* (Asparagus)**

Family: *Liliaceae*

A tuberous rooted, much branched plant with soft, needle shaped leaves called cladodes. Flowers are small, white in clusters and bright red berries.



### ***Aspidistra elatior* (Cast Iron plant)**

Family: *Liliaceae*

Thick rooted compact plant with bluish green, shining, oblong-lanceolate, leathery leaves upto 60cm long and narrowly channel stalk. It is good for growing in dark areas in the house.





***Aucuba japonica* (Hill croton)**

Family: *Cornaceae*

Leaves are leathery, narrowly oval, shining and dark green with yellow spots. It has greenish flowers and scarlet-red berries.



***Beaucarnea recurvata* (Elephant foot plant)**

Family: *Agavaceae*

It is a dwarf tree, but grown in pots for several years for its globose thick base of stem which is tapering upward and recurving dark green, tufted and thin leaves upto 1m.



***Begonia rex* (Foliage begonia)**

Family: *Benoniaceae*

Rhizomes are short and fleshy. Leaves are in various colours, large, obliquely ovate on the stalk.



***Calathea zebrina* (Zebra plant)**

Family: *Marantaceae*

Leaves are large, velvety, dark green with veins and midrib light green making strip patterns like zebra and purplish beneath.



***Chamaedorea elegans* (Chamaedorea)**

Family: *Palmaceae*

Plant is stem upto 2m. Leaves are pinnate, spirally arranged. Leaflets are straight and acuminate. Flowers are reddish orange and fruits small globose in shape.



***Codiaeum variegatum* (Croton)**

Family: *Euphorbiaceae*

It is an evergreen shrub with variety of size, shape and colour of leaves, which are simple, alternate, entire or twisted.



***Coleus blumei* (Coleus)**

Family: *Lamiaceae*

It is a soft perennial herb, branched and growing to one meter. Leaves are ovate, toothed and varied shape, size and colouring pattern.



***Cordyline terminalis* (Red dracaena)**

Family: *Liliaceae*

It is growing to 3m. Leaves are elliptic, ovate-lanceolate on slender stem, which is coppery green with red shade. Flowers are lilac tinted in long panicles.



***Cycas revolute* (Sago palm)**

Family: *Cycadaceae*

It is palm like foliage plant with naked seed bearing habit like gymnosperms. Leaves are crowded at top of cylindrical trunk.



***Dieffenbachia amoena* (Dumb cane)**

Family: *Araceae*

Leaves are large, oblong, pointed, stripped, spotted or speckled with white or yellow, 15-40cm long and poisonous sap causing pain and swelling of tongue.





***Dracaena marginata tricolor* (Rainbow plant)**

Family: *Dracaenaceae*

Leaves are long, linear, multi-colour, striped cream, yellow, green and red on margins.



***Dracaena sanderiana* (Lucky bamboo)**

Family: *Dracaenaceae*

Plants are with erect and slender growth. Leaves are lanceolate, 10-15cm long, wavy, green and cut leafy shoots are good for growing in plain water for interior decoration.



***Ficus benjamina* (Java fig tree)**

Family: *Moraceae*

Though a large tree in open, but grown as indoor pot plant or bonsai for its beautiful dark green leaves, shining, slender pointed in drooping branches.



***Ficus elastica* (Rubber plant)**

Family: *Moraceae*

Though a large tree in open, but grown as indoor pot plant for its glossy, oblong, thick leaves enclosed in rosy-red sheaths before opening.



***Fittonia verschaffeltii* (Fittonia)**

Family: *Acanthaceae*

Plants are herbaceous and are marked with coloured netted leaves having oval shape.



### ***Monstera deliciosa* (Monstera)**

Family: *Araceae*

Plants are climbing with thick stem. Leaves are large, thick, glossy, dark green (also variegated cream/yellow) with slashes and holes in leaf lamina. Greenish-brown aerial roots droop down from the climbing plants.



### ***Peperomia caperata* (Emerald ripple)**

Family: *Piperaceae*

It is a small compact plant bearing clusters of round, heart shape, corrugated leaves having dark green, chocolate or bronze colour with ridges often grayish or brown and petiole striped red.



### ***Philodendron selloum* (Selloum)**

Family: *Araceae*

It is a climbing plant on its own with thick large, bipinnate, dark green and lobed leaves without holes in lamina.



### ***Pilea cadierei* (Aluminium plant)**

Family: *Urticaceae*

Leaves are fleshy, obovate, quilled and dark green with irregular silvery bands between veins and greenish white flowers are borne in clusters.



### ***Platycerium bifurcatum* (Stag horn fern)**

Family: *Polypodiaceae*

It is a large epiphytic fern with large fronds, drooping, leathery, grayish to dark green and covered with white hairs. Fronds have forked twice and have soral patches at the end of the segments.





### ***Schefflera arboricola* ((Umbrella plant)**

Family: *Araliaceae*

Leaves are palmate, dark green with splashes or blotches of white, cream or yellow colours and arranged in a circle of 6-8 soft, leathery leaflets.



### ***Scindapsus aureus* (Money plant)**

Family: *Araceae*

It is a quick growing indoor climber having ovate, waxy, dark green with splashed white, cream or yellow leaves.



### ***Senecio cineraria* (Cineraria/ Silver dust)**

Family: *Asteraceae*

It is a semi-woody perennial with pinnately cut, thick ash or dusty silver colour leaves.



### ***Senecio radicans* (Fish hook)**

Family: *Asteraceae*

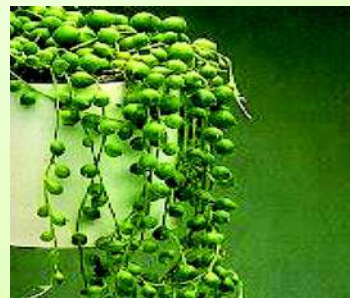
It is a succulent, trailing plant forming mats. Leaves are alternate, dark green, cylindrical, tapering, hooked and with translucent longitudinal lines.



### ***Senecio rowleyanus* (String of beads)**

Family: *Asteraceae*

It is a succulent, trailing plant and stem is filiform and forming mats. Leaves are globular like beads of green colour and flowers are creamy- white.



### ***Syngonium podophyllum* (Syngonium)**

Family: *Araceae*

It is a quick growing indoor climber with arrow shaped green and variegated leaves.





### ***Zebrina pendula* (Silvery wandering jew)**

Family: *Commelinaceae*

It is a trailing herb with small dark green to purple leaves having bright silvery bands and purple colour beneath.



**Exercise:** Visit the commercial Floriculture farms/ nurseries/ Florist shops and identify different foliage/ house plants being grown or sold based upon their distinguishable morphological characters.

#### **Observations:**

| S. No. | Name of the foliage/<br>house plant | Plant characteristics | Remarks |
|--------|-------------------------------------|-----------------------|---------|
| 1      |                                     |                       |         |
| 2      |                                     |                       |         |
| 3      |                                     |                       |         |

#### **Precautions:**

- Do not damage the foliage plants during identification.
- Carefully note the most distinguishable characters of foliage plants identified.

## EXERCISE 6.2: IDENTIFICATION OF MAJOR CACTI AND SUCCULENTS PLANTS

### Objective :

- To identify various cacti and succulents plants based on primary morphological characters.

**Delivery schedule :** 1 period

### Student's expectations/ Learning objectives:

- To get acquainted with different cacti and succulents plants grown in India

**Pre-learning required :** Knowledge about cacti and succulents plants.

**Handouts/material required/equipment's & tools:** Cacti and succulents plants, hand lens and standard encyclopedia and books on Floriculture

### Introduction:

Cacti and succulents are the group of plants, which have developed a special capacity to store water in thick fleshy leaves and/ or stem. These thrive well in sunny situation and are light loving requiring little care except when actively growing. Most of these plants are native to dryer part of the world. Cacti are different from succulents because of the following characters:

- ❖ All cacti are perennial belonging to dicotyledonous group
- ❖ All cacti are succulents on account of storing water, but all the succulents are not cacti
- ❖ Cacti are characterized by the presence of areoles (thick wooly hair cushions like barber hair brush) carrying spines, hairs or glochids
- ❖ All cacti belong to family Cactaceae
- ❖ Flowers arise from or near the areoles at top of ovary having almost every colour
- ❖ Fruits of cacti are one-celled berry
- ❖ Spines in cacti are modified leaves, provide shade, save from sun-scorching, protect from birds and conserve moisture by reducing transpiration
- ❖ Cacti plants are leafless except Pereskia (Rose cactus)



## Description of cacti and succulents plants

## Photograph

### *Aeonium arboreum* (Aeonium)

Family: *Crassulaceae*

It is a shrubby succulent growing to one meter tall. Leaves appear in dense rosette form at the apical part of branches. Flowers are golden yellow.



### *Agave victoriae-reginae* (Queen Agave)

Family: *Agavaceae*

Rosette spherical shaped plant with numerous leaves marked with white lines on the margins and terminal stiffed spine.



### *Aloe arborescens* (Aloe)

Family: *Liliaceae*

Plants are initially stem less. Leaves appear in loose rosette, spreading sword shaped and thick. Flowers are red or yellow appearing tall inflorescence like spike.



### *Astrophytum ornatum* (Monk's hood)

Family: *Cactaceae*

Stem spherical is with 8 spiral or straight ribs with silvery scales. Areoles are with 5-11 yellow-brown spines. Flowers are light yellow appearing at tip.



### *Cephalocereus senilis* (Old man cactus)

Family: *Cactaceae*

Stem is columnar growing straight and 20-30 ribs. Areoles are large with 1-5 yellowish spines and 20-30 hair like white bristles. Flowers are reddish and opening during night.



***Crassula arborescens* (Silver dollar/ jade)**

Family: *Crassulaceae*

It is a tree branching shrubby succulent. Leaves are thick green and nearly attached with the stem and with reddish dots. Flowers are white to pink.



***Echeveria spp* (Rock rose)**

Family: *Crassulaceae*

It is a low growing stem less plant with leaves appearing in rosette and in various colours. Flowers are red, pink, yellow colour and appear in raceme.



***Echinocactus grusonii* (Golden ball)**

Family: *Cactaceae*

Stem is globular and flat at top with white/ yellow wooly growth. It has 10-30 ribs. Areoles are large with 8-10 radial spines and 3-5 central spines of yellow or white colours. Flowers are small tubular and brown in colour.



***Euphorbia milii* (Crown of thorns)**

Family: *Euphorbiaceae*

It is a spiny shrubby succulent with long green leaves. Inflorescence is with coloured cyathophylls in red pink and yellow colours.



***Gasteria carinata verrucosa* (Warty aloe)**

Family: *Liliaceae*

It is an attractive succulent with suckering from the base with green leathery leaves having white spots and red tips.





***Gymnocalcium mihanvichii* (Plain chin cactus)**

Family: *Cactaceae*

Stem is depressed with globular shape in many colours like pink, yellow red, etc. Areoles are 3 on each rib and radical 5 spines. Flowers are creamy white.



***Haworthia species***

Family: *Crassulaceae*

Stem less rosette of various coloured leathery leaves with spiny tips and white markings in parallel lines



***Kalanchoe blossfeldiana* (Kalanchoe)**

Family: *Crassulaceae*

It is a bushy and compact stem growing erect with fleshy ovate-oblong leaves having sinuate and crenate margins. Flowers appear in bunches of red, yellow, pink or purple colours.



***Opuntia ficus indica* (Indian fig)**

Family: *Cactaceae*

Plant is shrubby growing to 3-4m tall with profuse flat branching. Areoles are white with yellow glochids. Flowers are pale yellow and fruits pear shaped and red when ripened.



***Pereskia aculeata* (Rose/ Lemon vine cactus)**

Family: *Cactaceae*

It is leafy climbing cactus with yellow to pink colour foliage. Areoles are 1-3, short and needle like spines. Flowers are white to yellow lemon scented.



### ***Schlumbergera bridgesii* (Christmas cactus)**

Family: *Cactaceae*

Stem is initially erect, flat, segmented and recurving later with 2-3 notched on either side. Flowers are cherry red.



### ***Sedum morganianum* (Donkey tail)**

Family: *Crassulaceae*

It is a sub-shrub with thick, round and drooping stem. Leaves are curved/ elongate and overlapping densely. Inflorescence is terminal with small scarlet flowers.



### ***Selenicereus grandiflorus* (Queen of night/ Brahma Kamal)**

Family: *Cactaceae*

Climbing type cactus with flat segmented stem and pinkish red large scented flowers opening during mid night.



**Exercise:** Visit the commercial Floriculture farms/ nurseries/ Florist shops and identify different cacti and succulents plants being grown or sold based upon their distinguishable morphological characters.

#### **Observations:**

| S. No. | Name of the Cacti/ succulents plant | Cacti/ Succulent | Plant characteristics | Flowers and inflorescence | Remarks |
|--------|-------------------------------------|------------------|-----------------------|---------------------------|---------|
| 1      |                                     |                  |                       |                           |         |
| 2      |                                     |                  |                       |                           |         |
| 3      |                                     |                  |                       |                           |         |

#### **Precautions:**

- Do not damage the cacti/ succulents plants during identification.



- Carefully note the most distinguishable characters of cacti/ succulents plants identified.
- Do not injure yourself from spine and areoles of cacti.

## **EXERCISE 6.3:**

### **IDENTIFICATION OF MAJOR BULBOUS PLANTS**

#### **Objective :**

- To identify various bulbous flower crops based on primary morphological characters.

**Delivery schedule :** 1 period

**Student's expectations/ Learning objectives:**

- To get acquaint with different bulbous flower crops grown in India

**Pre-learning required :** Knowledge about bulbous flower crops.

**Handouts/material required/equipment's & tools:** Bulbous flower crops, hand lens and standard encyclopedia and books on Floriculture

#### **Introduction:**

Those ornamental plants, which have specialized modified underground stem structures to overcome the unfavorable environmental conditions are known as ornamental bulbous plants. Different specialized modified underground structures, which function as storage of food- material are given below:

- ❖ Bulbs
- ❖ Corms
- ❖ Rhizomes
- ❖ Tubers
- ❖ Tuberous roots
- ❖ Tuberous stems, and
- ❖ Pseudo-bulbs

In Ornamental Horticulture (Floriculture), all these are known as bulbs or bulbous plants, but in Botany all differ in morphology and physiology, thus are known with

separate entity. The major purposes of planting bulbous plants in the garden are as follows:

- ❖ To enhance the beauty of surroundings
- ❖ To provide fragrance in the garden
- ❖ To divide different areas or features in the garden
- ❖ Softening harsh building lines as corner and foundation planting
- ❖ To provide background for growing annual flowers
- ❖ To grow alongside of stream, pond
- ❖ To make herbaceous borders
- ❖ To reduce soil erosion
- ❖ To conserve moisture
- ❖ To discourage weed growth
- ❖ To grow in pots and hanging baskets

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#### Description of bulbous plants

#### Photograph

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##### ***Agapanthus africanus* (Agapanthus/ Blue African Lily)**

Family: *Alliaceae*

It has long, thick, narrow and dark green foliage. Flowers are trumpet shaped blue or white coloured and borne in umbels on long stalk. It has true tunicate bulbs.



##### ***Amaryllis belladonna* (Amaryllis)**

Family: *Amaryllidaceae*

The plant is 60-70 cm tall and has long strap shape, long and dark green leaves. Flowers are large trumpet shape in red, pink, white or in strips during in 2-4 flowers borne on long scape. It has true tunicate bulbs.



***Begonia tuberhybrida* (Tuberous begonia)**

Family: *Begoniaceae*

The tuberous rooted begonia plants are growing to 45 cm tall and has beautiful flowers resembling rose mainly double in various colours. It has true tubers.



***Canna indica* (Canna/Indian shot)**

Family: *Cannaceae*

Canna plants are growing to 1.5m tall and have green to bronze colour foliage. Flowers are orchid or truss flowering in various colours like red, yellow and orange.



***Clivia miniata* (Kaffir lily)**

Family: *Amaryllidaceae*

It is an attractive evergreen bulbous plant having dark green strap shape leaves. Flowers are orange-yellow funnel shape and borne in umbels on scape during February-April. It has true tunicate bulbs.



***Crocasmia aurea* (Montbretia)**

Family: *Iridaceae*

It is an attractive bulbous plant with orange-yellow flowers (florets) borne in spikes during May-September. It has true corms.



***Crocus sativus* (Saffron)**

Family: *Iridaceae*

It is a dwarf growing with grass like green leaves and fragrant violet-blue flowers borne on slender long stalks during September-October. It has true corms.





### ***Dahlia variabilis* (Dahlia)**

Family: *Asteraceae*

Dahlia has plants from one 0.3 to 2m. Leaves are on every node in opposite having 3-5 leaflets. Flowers are single to double from 5cm to 20cm across in almost every colour. It has true tuberous roots.



### ***Freesia refracta* (Freesia)**

Family: *Iridaceae*

It is a dwarf bulbous plant. Highly fragrant trumpet shape flowers (florets) in various colours are borne in racemes/ spikes during December-April. It has true corms.



### ***Gloriosa superba* (Glory lily)**

Family: *Liliaceae*

It is a climbing bulbous flower. It has primrose yellow to dark red flowers with wavy and corrugated petals during July to September. It has true tubers.



### ***Haemanthus multiflorus* (Football lily)**

Family: *Liliaceae*

It is medium height bulbous flower with strap shape green and oblong leaves. Flowers are large ball shape and crimson red coloured during May-September. It has true bulbs.



### ***Hemerocallis fulva* (Day lily)**

Family: *Liliaceae*

It is tall bulbous flower opening during day- time. Flowers are large trumpet shape and orange-yellow colour during May-September. It has true bulbs.



### ***Hyacinthus orientalis* (Hyacinth)**

Family: *Liliaceae*

It is dwarf bulbous flower. Flowers are tubular to bell shaped in compact racemes of various colours during February to April. It has true bulbs.



### ***Iris nepalensis* (Iris)**

Family: *Iridaceae*

It is a medium height bulbous plant. Leaves are sword shaped. It has blue to lilac flowers appearing during February-April. It has true rhizomes.



### ***Kniphofia aloides* (Torch lily)**

Family: *Liliaceae*

It is medium height bulbous flower. Leaves are narrow, long and recurving. Flowers are tubular, yellow, orange and red colour and borne in long spikes at upper portion during March to August. It has true bulbs.



### ***Lilium tigrinum* (Tiger lily)**

Family: *Liliaceae*

It is a tall bulbous flower. Leaves are small, glossy green and growing upward on the whole stem. Flowers are recurving, light orange with black spots during April-July. It has true non-tunicate bulbs.



### ***Narcissus pseudonarcissus* (Daffodil)**

Family: *Amaryllidaceae*

Leaves are narrow, dark green and growing straight upward. It has large trumpet flowers. Flowers are yellow, orange, white with same of different color corona during December-April. It has true tunicate bulbs.





### ***Ornithogalum thyrsoides* (Chinchee-rinchee)**

Family: *Liliaceae*

It is a dwarf bulbous flower. Leaves are green, long and narrow. Flowers are white, star shape and fragrant during April to June. It has true tunicate bulbs.



### ***Tulipa hybrida* (Tulip)**

Family: *Liliaceae*

It is a dwarf bulbous flower. Leaves are strap shape large at base and narrow upward. Solitary flowers are borne on long scape in various colours during February to April. It has true tunicate bulbs.



### ***Zantedeschia aethiopica* (Calla lily)**

Family: *Araceae*

Leaves are large, dark green and arrow-head shape. It has beautiful white, cream and yellow spathe and spadix during February to June. It has true rhizomes.



### ***Zephyranthes grandiflora* (Zephyr lily)**

Family: *Liliaceae*

It is a dwarf bulbous flower. Leaves are barrow grass like appearing after flower scape emergence. Star shape pink, white flowers borne solitary on scape during April to July. It has true tunicate bulbs.



### **Procedure:**

- Visit the commercial Floriculture farms/ nurseries/ Florist shops and identify different bulbous flowers being grown or sold based upon their distinguishable morphological characters.



### Observations:

| S. No. | Name of the bulbous flower/ plant | Under ground plant part | Plant characteristics | Flowers and inflorescence | Remarks |
|--------|-----------------------------------|-------------------------|-----------------------|---------------------------|---------|
| 1      |                                   |                         |                       |                           |         |
| 2      |                                   |                         |                       |                           |         |
| 3      |                                   |                         |                       |                           |         |

### Precautions:

- Do not damage the bulbous flower crops during identification.
- Carefully note the most distinguishable characters of flower crops identified.