



J. C. Bose University of Science and Technology, YMCA, Faridabad
(formerly YMCA University of Science and Technology)

A State Govt. University established wide State Legislative Act. No. 21 of 2009
Accredited 'A' Grade by NAAC

Department of Environmental Sciences

Dated: 04.03.2020

NOTICE

It is for the information of all that Vasundhara – Student Society of the Department in association with Estate Office of the University has refurbished '**Green House**' recently. It houses about 26 varieties of ornamental, herbal, flowering and seasonal plants and saplings.

All the staff members and students are requested to cooperate in their maintenance and help in Green Campus Drive of the University.

4/3/2020
Chairperson (EVS)

All Notice Boards

Copy to:

- PA to VC for kind information of Hon'ble Vice-Chancellor
- PA to Registrar for kind information of Worthy Registrar
- All Chairpersons (ME/CE/IT/EL/EE/Civil/Physics/Chemistry/Maths/Humanities/MBA), Principal CCS&D - with a request to circulate among students and staff members.
- All branches (Estb/Accounts/Examination/Academics/S&P/TPO)
- XEN/SDE

REPORT ON GREENHOUSE



**J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY
YMCA, FARIDABAD
NAAC 'A' GRADE ACCREDITED STATE UNIVERSITY
SECTOR-6, MATHURA ROAD, FARIDABAD -121006
(HARYANA)**

Table of Contents

S.No.	Contents	Page No.
	Executive Summary	
1.	Introduction	4
2.	Objectives	4
3.	Importance of Greenhouse	5
4.	Significance of developing Greenhouse at campus	5
5.	Challenges faced during Greenhouse development	7
6.	Futuristic applications of Greenhouse	7
7.	Salient features of Gymnosperms	9
8.	Salient features of Angiosperms	10
	Annexure	

Executive Summary

Greenhouse is basically a structure for cultivating diverse plants customized as per our requirements in the university. The greenhouse provides a system for plant collection that serves the students, faculty and staff in the university. It will help research scholars, undergraduate and postgraduate students for smooth running of the plant-based experiments. There are polyphasic uses of developing greenhouse in the university premises. The greenhouse offers protection to the plants during adverse conditions. It also protects plants from harmful pests and predators that may severely damage the crop. Greenhouse will provide the ideal environment to learn about variety of plant species including herbal, medicinal, succulents and xerophytes. Green, ecofriendly, peaceful and serene environment shaped in the university campus have its own esthetic values that will help teachers, academicians, researchers, students and staff members to keep them positive, optimistic and confident in their opinions and thoughts. While developing the greenhouse several challenges were faced. Soil available in the campus was having very high pH and water initially available for the irrigation purpose was very hard. To overcome the constraints related to the high pH and hard water, a new water supply was made available, a watershed was constructed and fresh soil mixed with manures were used for plantation in greenhouse. All the efforts are well taken to arrange plants systematically inside the greenhouse on the basis of angiosperms and gymnosperms so that it can tremendously help our students.



Dr Komal Taneja
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J.C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA

(NAAC 'A' GRADE accredited State University)

SECTOR-6, MATHURA ROAD, FARIDABAD -121006 (HARYANA)

GREENHOUSE

Introduction

A Greenhouse is a structure with walls and roof made chiefly of transparent material, such as polyethylene, polycarbonates, green fabric cover in which plants requiring regulated climatic conditions are grown. These structures range in size from small sheds to industrial-sized buildings. The purpose of a greenhouse is to shield crops from excess cold or heat and unwanted pests. Certain types of economically important plants are cultivated inside greenhouse. A greenhouse works by converting light energy into heat energy. The shading cloth and polyacrylic sheet covering the greenhouse help in absorbing the sunlight and keep the environment warm in extreme winters.

Objectives

The objective of the greenhouse is to provide a system for plant collection that serves the students, faculty, staff and other academic units at the campus. Greenhouse will provide the ideal environment to learn about variety of plants including herbal, medicinal, succulents, xerophytes etc. It will also help researchers to study enormous plant diversity and different plant kingdom. Students of Department of Life Sciences and Environmental Sciences will be benefitted, as it will provide plant lab material for the related experiments. Green, ecofriendly environment created in the university campus have its own aesthetic values that will help the academicians, researchers, students and staff members to keep them positive in their thoughts and rejuvenated.

Importance of Greenhouse

- One of the main advantages of Greenhouse is that it offers a longer growing season. Temperatures don't vary as much within a greenhouse, since the sun's radiation is trapped in the enclosure, retaining the heat within the structure. Growing seasons can be extended, even in cold climates. Greenhouse protect the plants from outside rain and keep environment dry.
- Another advantage of greenhouse is that it protects plant from pest and pathogens. Pests and predators including squirrels can be easily kept out. Smaller pests, like certain rodents, can be kept out as the sealing of the green cover creates a boundary that blocks pest entry in the greenhouse.
- Bad weather like high winds, dust storms, thunder storms and blizzards can all cause damage to the naturally grown crops, however, a greenhouse offers plants a layer of protection from these elements.
- As greenhouse provides optimum growing environment for the plants. Different types of herbs, shrubs, climbers, flowers etc could be easily grown in the greenhouse.
- Adding more plants in the greenhouse helps to provide a fresh, clean atmosphere, making greenhouse a great tool for fighting global warming.

Significance of developing Greenhouse in campus

Development of Greenhouse in the university premises protect the plants from significant temperature fluctuations. The main significance of Greenhouse is to provide a plant collection that serves the students, faculty, staff and other academic units at campus so as to:

- Provide the ideal environment to learn about plants.
- For research and demonstration of the diversity of the plant kingdom.
- To provide plant material to the students for performing experiments.
- Greenhouse in campus help the botany students to perform their research work efficiently.

- Plant material could be harvested from different sections of monocots, dicots, angiosperms and gymnosperms for performing related experiments such as stem and root sectioning and staining.
- Students will be also taught about different plant irrigation system including drip irrigation, sprinkling methods for watering plants that will help in minimizing wastage of water.

Challenges faced during Greenhouse development

- While developing a greenhouse it is important to have a thorough knowledge of the plant's species. Moreover, it is essential to have technical knowledge about the correct temperature, humidity, daylight/shading patterns of the plant types.
- Sources for getting certified planting material is also a prerequisite for proper greenhouse development.
- The detailed information regarding amount of water supply to plant is essential. As some xerophytic plants like cactus need less quantity of water, whereas others may need daily supply of water.
- For providing proper water supply water shed is constructed near the greenhouse so that plants can be adequately watered as per the requirements.
- While developing greenhouse main problem faced was of saline water supply that was affecting the plants and causing damage to it. Hence, great efforts were taken to provide special water supply to the plants to avoid further damages.
- Organic manure was added to the soil to make it more productive as initially the pH of the soil was quite high and it was alkaline.



Glimpse of Green House in the university campus

Futuristic applications of Greenhouse

Futuristic application of greenhouse may include rearing of certain insects such as ladybug, butterflies, honeybees which helps in pollination. Greenhouse gardening can even offer the advantage of saving water. While using a greenhouse, it's possible to conserve water, since these energy sources can more easily be controlled as opposed to traditional gardening. Using a greenhouse is not just about the benefits and advantages of growing plants, but also during the lifestyles of the individual and living in a more environmentally friendly condition.

Following is the arrangement in which plants have been kept in the greenhouse on the basis of division in gymnosperms and angiosperms (monocots and dicots).



Angiosperms (Dicots)

Angiosperms (Monocots)



Top row (Gymnosperms), Middle row (Ferns), Lower Row (Succulents)

Gymnosperms are woody plants, either shrubs, trees, or, rarely, vines. They differ from flowering plants in that the seeds are not enclosed in an ovary but are exposed within any of a variety of structures, the most familiar being cones. Angiosperms are plants that produce flowers and bear their seeds in fruits. They are the largest and most diverse group within the kingdom Plantae. They are diverse in number and in our greenhouse, there are nearly seventeen different families of angiosperms and five different families of gymnosperms that are included. Monocots and dicots are types of angiosperms as the presence of covered seed and cotyledons is a feature of angiosperms only. Certain families of monocots as well as dicots placed in the greenhouse are Moraceae, Asteraceae, Cyperaceae, Apocynaceae, Verbenaceae, Arecaceae, Apiaceae, Malvaceae, Lamiaceae, Zingiberaceae, Fabaceae, Euphorbiaceae, Asparagaceae, Cactaceae, Crasulaceae and Araceae. Some of the important Gymnosperm family comprising Cupressaceae, Cycadaceae, Nephrolepidaceae, Poaceae and Asphodelaceae are also the part of our greenhouse.

Salient features of Gymnosperm families

Cupressaceae: The Cupressaceae are distinguished in being monoecious or dioecious trees or shrubs with spiral, decussate, or whorled deltoid-subulate, linear, or acicular leaves (in flattened or deciduous branchlets in some taxa), the pollen cones usually with multiple (2–10) microsporangia per microsporophyll.

Cycadaceae: The Cycadaceae are woody, unbranched or sparsely branched, palmlike, dioecious, seed-bearing trees or shrubs with thick, pithy stems.

Nephrolepidaceae: Kidney-shaped and scale like structure is the key feature of this family. It is represented by about 30 species. These species are distributed in the tropics of the entire world.

Poaceae: Mostly herbs, stem jointed, fistular, cylindrical; leaves simple, alternate, sheathing, sheath open, ligulate; inflorescence compound spike; flowers zygomorphic, hypogynous, protected by palea; perianth represented by 2- or 3-minute scales (lodicules); stamens 3, versatile; carpel one, style 2 or 3, stigmas feathery, basal placentation; fruit caryopsis; testa fused with pericarp.

Asphodelaceae: Members of the Asphodelaceae are diverse, with few characters uniting the three subfamilies currently recognized. The presence of anthraquinones is one common character. The flowers (the inflorescence) are typically borne on a leafless stalk (scape) which arises from a basal rosette of leaves. The individual flowers have jointed stalks (pedicels). A disk of woody tissue (a hypostase) is present at the base of the ovule.

Some of the important features of Angiosperm families

Euphorbiaceae : The Euphorbiaceae are distinctive in having unisexual flowers with a superior, usually 3-carpellate ovary with 1 ovule per carpel, apical-axile in placentation, many taxa with red, yellow, or usually white milky latex, the Euphorbioideae alone with reduced staminal flowers, some with a characteristic cyathium.

Malvaceae: Stellate hairs on the young parts, mucilaginous juice present, leaves alternate, stipulate, multicostate reticulate; inflorescence solitary or cyme; flower actinomorphic, hermaphrodite, hypogynous, pentamerous, with epicalyx, calyx free or united, corolla free; stamens indefinite,

monadelphous; anthers monothecous, stamens united to form a tube; gynoecium many often five, syncarpous, ovary multilocular, superior, axile placentation; fruit schizocarpic carcerulus or capsule.

Fabaceae: Fabaceae, also called Leguminosae, pea family of flowering plants (angiosperms), within the order Fabales. Fabaceae, which is the third largest family among the angiosperms consists of more than 700 genera and about 20,000 species of trees, shrubs, vines, and herbs and is worldwide in distribution. Some of the most important commercial species.

Moraceae: The mulberry family (Moraceae) comprises of deciduous or evergreen trees and shrubs, distributed mostly in tropical and subtropical regions. Plants of the family contain a milky latex and generally feature unusual fruits formed by the fusion of the ovaries of many flowers.

Asteraceae: The Asteraceae are distinctive in being herbs, shrubs, vines, or trees, the inflorescence a head (capitulum) subtended by an involucre of phyllaries, flowers either bilabiate, disk, or ray/ligulate.

Cyperaceae : Plants usually herbs with 3 angled stem, solid culm; leaves with entire sheathing base not split on one side; flowers in spikelets of cymes, subtended by a single glume, naked or with perianth of scales or hairs; stamens 1 to 3; carpels 2 or 3, ovary superior, unilocular with single basal ovule; fruit an achene or nut, seed endospermic.

Cactaceae: Plant fleshy with tufts of thorns; stems flattened, jointed, succulent, apparently leafless; flowers large, usually solitary, hermaphrodite, epigynous; tepals indefinite with gradual transition from sepals to petals, stamens indefinite, Carpels syncarpous, ovary inferior unilocular, parietal placentae; fruit berry.

Detailed description of all the plants kept in greenhouse is attached in the Annexure.

Annexure



Ficus elastica

Plant Name - *Ficus elastica* (Rubber fig)

Classification –

Kingdom - Plantae

Class - Magnoliopsida

Order - Rosales

Family - Moraceae

Genus - *Ficus*

Species - *elastica*

Habitat -

- The Rubber fig is native to southeast Asia and is commonly grown as an indoor pot plant.
- Temperature range - It grows well in a broad range of temperatures between 10 to 29 degree Celsius.
- Direct / Indirect sunlight – Bright, indirect sunlight is ideal for Rubber fig.
- Humidity – They need a habitat of high humidity. It grows well with a humidity level of over 50%.

Special Characteristics -

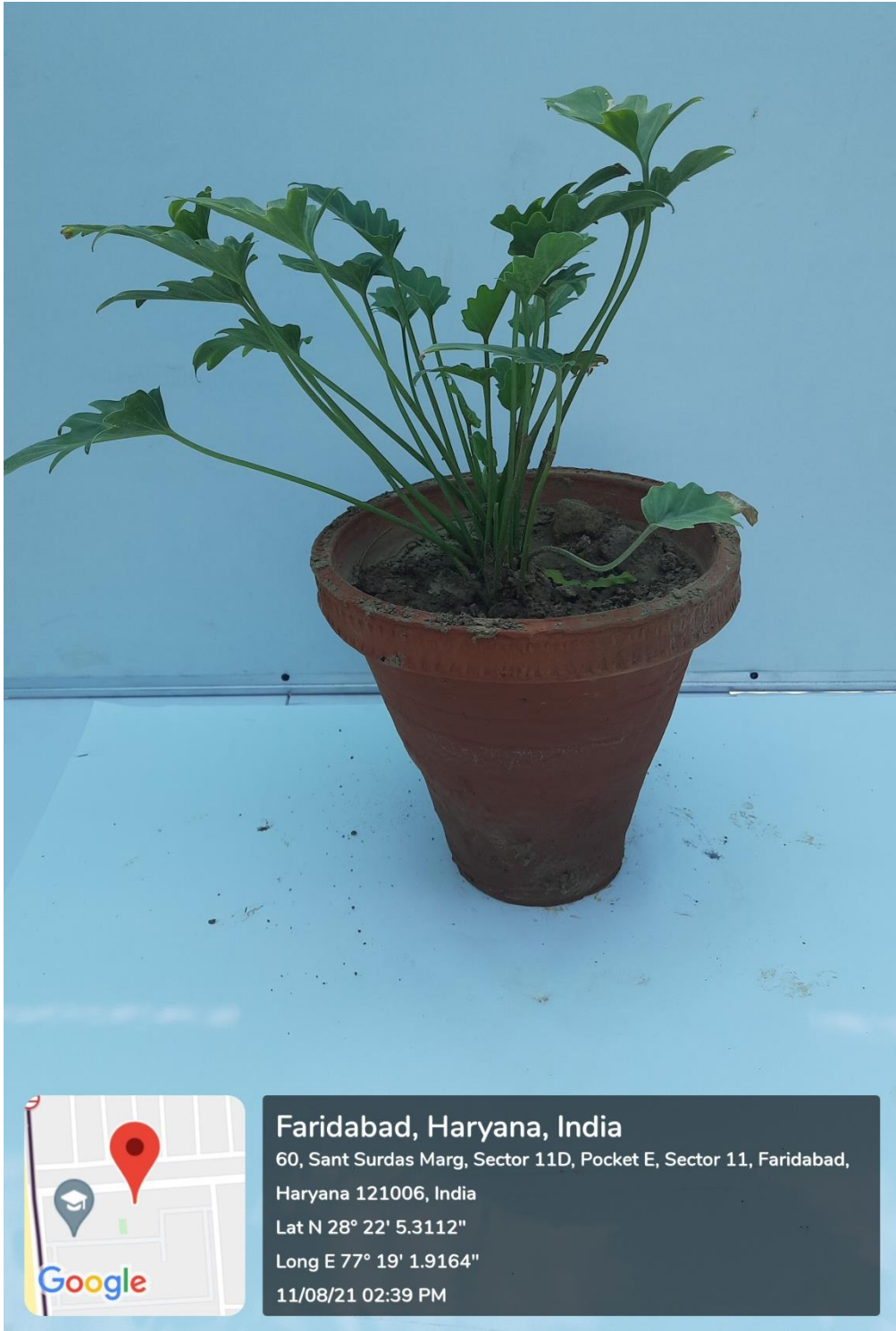
- Mature trees develop banyan – like aerial roots that form trunks.
- The milky sap of rubber fig is slightly toxic to pests. In humans, contact with the milky latex may result from simple, irritation to severe dermatitis.

Economic Importance -

- Medicinal use- full of vitamins and rich in sugar, the fruit of rubber fig contains a substance called mucilage which is also present in aloe vera and cactus. The dry fig water is a great mouth cleaner.
- The latex can be applied on warts and corns to heal them. The dry and raw figs can be very beneficial for constipation.
- It is also grown as an ornamental plant or a house plant.

Additional Feature –

- It is noted for its thick, leathery, glossy dark green leaves and pink to purplish stipules.
- Rubber fig reduces formaldehyde and carbon monoxide from surrounding air.



Gerbera jamesonii

Plant Name - *Gerbera jamesonii* (Gerbera daisy/African daisy)

Classification –

Kingdom: Plantae
Class: Magnoliopsida
Order: Asterales
Family: Asteraceae
Genus: *Gerbera*
Species: *jamesonii*

Habitat -

- *Gerbera jamesonii* is found naturally in grassland in sandy, well-drained soils in Mpumalanga, South Africa. It is also found in subtropical and temperate climate.
- Temperature range - 12-24 degree Celsius.
- Direct / Indirect sunlight - Full direct sunlight for 6-8 hours.
- Humidity - Above average humidity levels, although average is fine.

Special Characteristics -

- *Gerbera jamesonii* is native to South Africa. Commonly called gerbera daisy, Transvaal daisy or Barberton daisy, this species is a stemless, clump-forming, tender perennial.
- Each flower is attached to a leafless stem that raises about 6 inches above the plant's foliage, which is a tall 12-inch-wide clump of long, slightly "fuzzy" leaves.
- Gerberas produce flowers from late spring through autumn in the garden, and their blooms make long-lasting cut flowers.

Economic Importance -

- Used as a model organism in studying flower formation.
- Decorative uses.

Any Additional Feature -

- The species is perennial and reproduces asexually.
- This plant produces tall colorful flowers in season.
- The flowers may be red, yellow, pink, or orange.



Cyperus alternifolius

Plant Name - *Cyperus alternifolius* (Umbrella papyrus)

Classification –

Kingdom: Plantae
Class: Monocotyledonae
Order: Poales
Family: Cyperaceae
Genus: *Cyperus*
Species: *alternifolius*

Habitat -

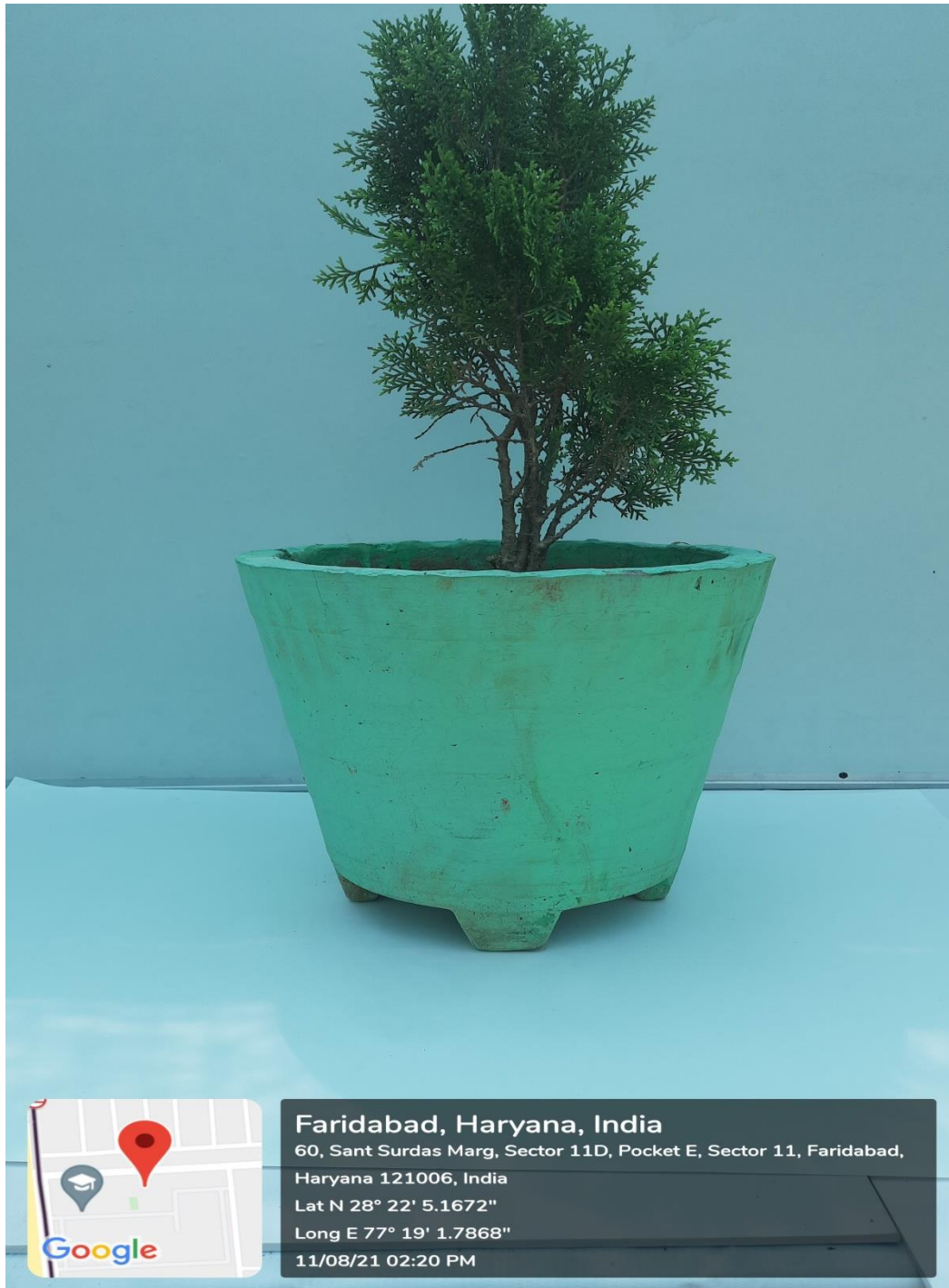
- Umbrella papyrus is native to West Africa, Madagascar, and the Arabian Peninsula, but widely distributed throughout the world.
- Temperature range - 10 to 22 degree Celsius.
- Direct/Indirect sunlight - Full sun to part shade
- Humidity - prefers a warm, humid environment.

Special Characteristics -

- *Cyperus alternifolius*, commonly called umbrella plant or umbrella palm, is a perennial sedge that features a grass-like clump of triangular green stems typically growing to 2-3 feet tall.
- Each stem is topped by a whorl of 10-25 drooping leaf-like bracts that resemble the ribs of a raised umbrella.
- Flowers in greenish-brown clusters appear in summer in the bract axils.
- Genus name comes from the Greek word **kypeiros** which was the name given to some local sedges.
- It is propagated by dividing the roots and requires copious amounts of water. The cultivar *Cyperus alternifolius* 'Variegatus' is grown for its variegated foliage and smaller size.

Economic Importance -

- Throughout the world, many species of Cyperaceae have regional importance in weaving mats, baskets, screens, and even sandals because of their strong, fibrous stems and leaves.
- *C. alternifolius* is widely grown as an ornamental plant, also indoors in temperate climates.
- In Kenya, it is also used as forage and, possibly because the plant contains alkaloids, in Africa, decoctions are taken to cure digestive system disorders and fevers, and ash is applied to disinfect wounds.



Platycladus orientalis

Plant name - *Platycladus orientalis* (Chinese thuja, Oriental thuja)

Classification –

Kingdom: Plantae
Class: Pinosida
Order: Pinales
Family: Cupressaceae
Genus: *Platycladus*
Species: *orientalis*

Habitat -

- Native to northwestern China, Korea, and Far East Regions of Russia.
- Temperature range - 25 to 32 degree Celsius.
- Direct / Indirect sunlight - Full sunlight to part shade.
- Humidity - low to high.

Special Characteristics -

- A monoecious shrub or small to medium sized tree up to 20m tall.
- Often forms multiple stems and have thin reddish-brown bark.
- Leaves decussately opposite.

Economic Importance -

- Leaves are antibacterial, antipyretic and diuretic.
- Twigs and leaves are a good source of tannin.
- Stems are used in the treatment of coughs, colds, and parasitic skin diseases.

Any Additional Feature -

- Grows as a dense, conical to columnar tree.
- It is also tolerant of soils with high pH.



Araucaria heterophylla

Plant Name - *Araucaria heterophylla* (Australian Pine, House Pine)

Classification –

Kingdom: Plantae
Class: Trachrophytes
Order: Pinales
Family: Araucariaceae
Genus: *Araucaria*
Species: *heterophylla*

Habitat -

- Norfolk Island in Pacific Ocean, East of Sydney, Australia between New Zealand & New Caledonia, Native to North America (Mediterranean climate), Suitable for growing indoors.
- Temperature range - Summer (18 to 24 degree Celsius), Winter (5 to 10 degree Celsius).
- Direct / Indirect sunlight - Direct sunlight .
- Humidity - 50% relative humidity, (plants require moist conditions).

Special Characteristics -

- Evergreen conifer.
- Long term health usually not affected by pests.
- Moderately salt tolerant.
- Pyramidal shape.

Economic Importance -

- Ornamental plants.
- Seeds are edible.
- High quality woods are used for making crafts.

Any Additional Feature -

- Whorled branches – 5 branches per whorl.
- Dioecious.
- Life cycle – perennial & woody.
- Propagation is by seeds or cuttings of erect shoot tips only.



Cycas revoluta

Plant Name - *Cycas revoluta* (Sago Palm, King Sago Palm)

Classification –

Kingdom: Plantae
Class: Cycadopsida
Order: Cycadales
Family: Cycadaceae
Genus: *Cycas*
Species: *vulgaris*

Habitat -

- *Cycas revoluta* is native only to Japan's southern islands and the extreme south end of the southernmost main island, Kyushu, in Kagoshima Prefecture. Its habitat is rocky shores where it can be found growing on near vertical rock faces in full sun.
- Temperature range - -11 to 42 degree Celsius.
- Direct / Indirect sunlight - bright light and full direct sunlight.
- Humidity - Average to above average humidity levels are best suited.

Special Characteristics -

- Trunk simple.
- rarely branched and 2-3 meters tall.

Economic Importance -

- Cycadales are of definite importance as food plants and used variously as the source of food materials such as 'sago' and 'seed starch' vegetables, cakes, kaffir bread and poultry feed.

Any Additional Feature -

- Cycads are woody plants which produce seeds within the living seed plants.
- They are nearly unique in that they produce motile sperm cells, and thus are an important link to the earliest of the ancient seed plants.



Nephrolepis exaltata

Plant Name - *Nephrolepis exaltata* (Sword fern or Boston fern)

Classification-

Kingdom: Plantae
Class: Polypodiopsida
Order: Polypodiales
Family: Nephrolepidaceae
Genus: *Nephrolepis*
Species: *exaltata*

Habitat -

- Native to Florida, West Indies, Mexico, America, Africa.
- Temperature range - 18-22 degree Celsius.
- Direct / Indirect sunlight - Partial sunlight (tolerate a shady place of 4 to 5 weeks, doesn't
- tolerate direct sunlight.
- Humidity - High humidity (50%+)

Special characteristics -

- It is an evergreen fern that grows with an upper spreading habit to 3 feet tall.
- Frond (leaves) are pinnately compound, lanceolate shaped.
- Pinnae are auricles and asymmetrical.

Economic importance -

- Used for medicines and as biofertilizer.
- It is the best air purifying houseplant (help to get rid of harmful toxins in homes), improves humidity.
- Used as an ornamental plant.

Any additional feature -

- Plant form dense clump.
- The stolons are slender and wiry, also with some scales.



Gymnema sylvestre

Plant Name - *Gymnema sylvestre* (Gurmar)

Classification -

Kingdom: Plantae

Class: Magnoliopsida

Order: Gentianales

Family: Apocynaceae

Genus: *Gymnema*

Species: *sylvestre*

Habitat -

- Temperature range - 25-35 degree Celsius
- Direct / Indirect sunlight - Full sunlight to partial sunlight.
- Humidity - 77-88%

Special characteristics -

- The plant is a climber with leaves having soft hairs on the upper surface.
- The leaves are elongated-oval in shape.
- It has a small, yellow, umbelliferous inflorescence that is produced throughout the year.

Economic Importance -

- It is an important medicinal climber.
- All parts of *Gymnema sylvestre* are used for the treatment of rheumatism, blood-vessel inflammation, hemorrhoids, and snake bites.
- The leaves are used in the treatment of fevers and coughs.

Any Additional Feature -

- Its leaves and extracts contain gymnemic acids, the major bioactive constituents that interact with taste receptors on the tongue to temporarily suppress the taste of sweetness.



Lantana camara

Plant Name - *Lantana camara* (Common lantana)

Classification -

Kingdom - Plantae

Class - Dicotyledonae

Order - Lamiales

Family - Verbenaceae

Genus - *Lantana*

Species - *camara*

Habitat -

- Temperature range - -2-12 degree Celsius
- Direct / Indirect sunlight - Full sun
- Humidity - 88-90%

Special Characteristics -

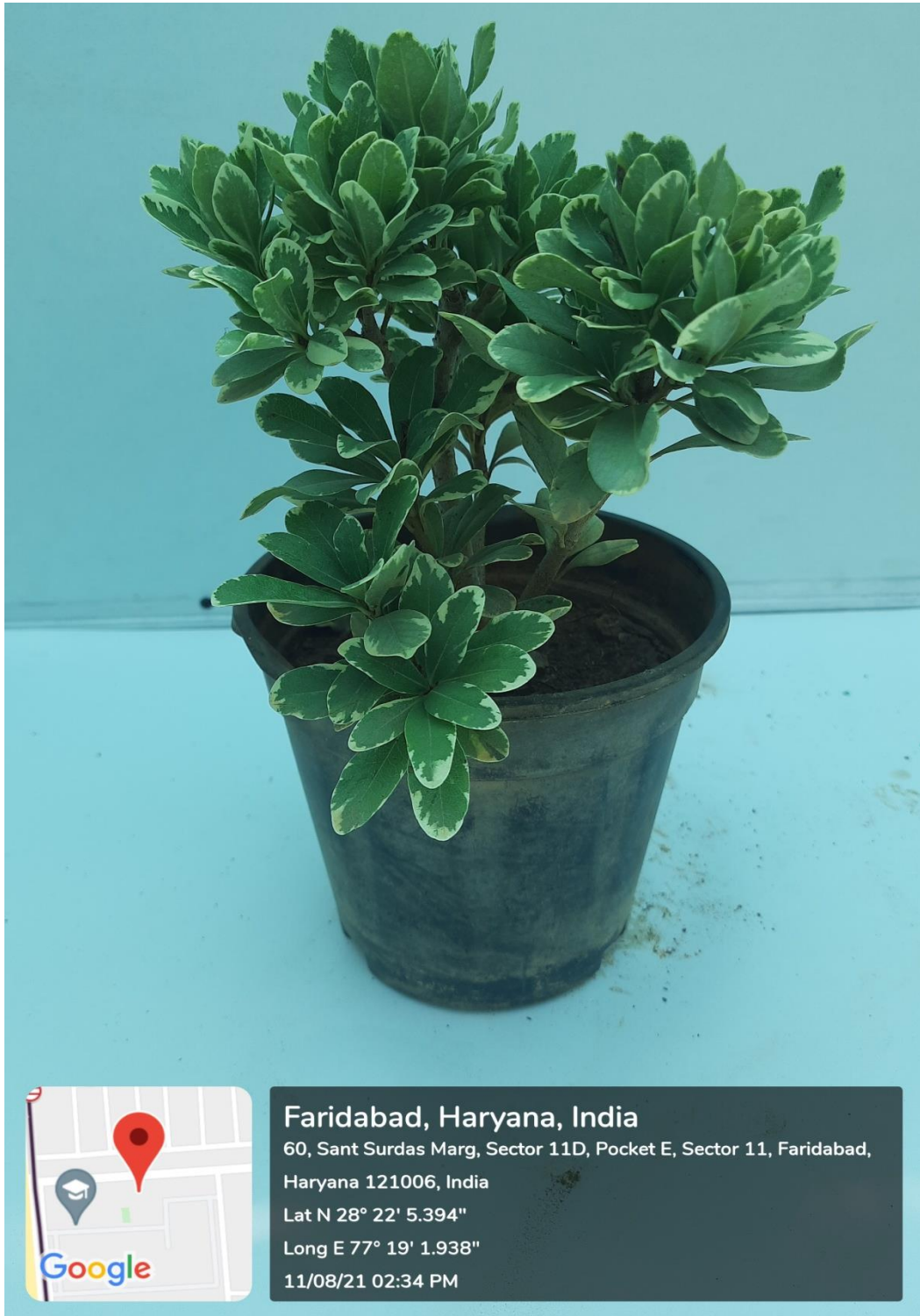
- It has thorny shrub upright, half climbing or sometimes more or less hanging, reaching 2-3 metre in height.
- The inflorescence is a hemispherical head, axillary or terminal, multi-coloured, made up of many small tubular flowers.

Economic Importance -

- The aromatic leaves are used to make a tea.
- The ripe black fruits are eaten in handfuls, especially by children as a snack.
- *Lantana* leaves can display antimicrobial, fungicidal and insecticidal properties.
- It has also been used in traditional herbal medicines for treating cancer, skin itches, leprosy, chicken pox, measles, asthma and ulcers.
- *Lantana camara* has been grown specifically for use as an ornamental plant.

Any Additional Feature -

- *Lantana camara* is poisonous to livestock and children have been known to die after eating unripe berries.
- Green unripe fruits of the plant are toxic to human. However, ripen fruits are edible and non-toxic according to other survey and studies conducted.



Faridabad, Haryana, India

60, Sant Surdas Marg, Sector 11D, Pocket E, Sector 11, Faridabad,
Haryana 121006, India

Lat N 28° 22' 5.394"

Long E 77° 19' 1.938"

11/08/21 02:34 PM

Calotropis gigantea

Plant Name - *Calotropis gigantea* (Crown flower)

Classification –

Kingdom - Plantae

Class - Dicotyledons

Order - Gentianales

Family - Apocynaceae

Genus - *Calotropis*

Species - *gigantea*

Habitat -

- Temperature range – USDA hardiness zone 10-12 (lows- 1.1 degree Celsius or 30 degree Celsius).
- Direct / Indirect sunlight – full sun to part shade.
- Humidity – at 28-37, humidity- 70-75 %

Special Characteristics-

- *Calotropis gigantea*, commonly called crown flower or giant milkweed, is a large shrub or small tree.
- The aestivation found in *Calotropis* is valvate i.e., sepals or petals in a whorl just touch one another at the margin, without overlapping.
- The plant has oval, light green leaves and milky stem. The latex of *Calotropis gigantea* contains cardiac glycosides, fatty acids, and calcium oxalate.

Economic Importance -

- *Calotropis* is used for digestive disorders including diarrhea, constipation and stomach ulcers; for painful conditions including toothache, cramps, and joint pain; and for parasitic infections including elephantiasis and worms.
- *C. gigantea* is reported to exhibit mosquito controlling properties against *Culex gelidus* and *Culex tritaeniorhynchus* mosquitoes which serve as vectors for Japanese encephalitis. The aqueous extract of the *C. gigantea* leaves demonstrated significant larvicidal, repellent and ovicidal activity.
- DIP-2, a product developed by DIPAS, India, from the alcoholic extract of *C. gigantea*, has been found to be a potential skin permeation enhancer.
- The milky juice of *Calotropis* was used against anthrax, cancer, and as an antidote from snake bite.

Any Additional Feature -

- Recent studies have displayed use of calotropin as a contraceptive and as a promising cancer medication.
- Calotropin from milk of *Calotropis gigantea* a potent inhibitor of COVID 19 corona virus infection by Molecular docking studies.



Livistona chinensis

Plant Name - *Livistona chinensis* (Fountain palm)

Classification -

Kingdom - Plantae

Class - Monocotyledonae

Order - Arecales

Family – Arecaceae

Genus - *Livistona*

Species - *chinensis*

Habitat -

- Temperature range - 18-29 degree Celsius.
- Direct / Indirect sunlight - It requires heat and light but direct sunlight can cause burning of the leaves.
- Humidity - They thrive in warm, humid weather.

Special Characteristics-

- *Livistona chinensis*, commonly called as Chinese fan palm or fountain palm, is a species of subtropical palm tree of east Asia.
- These slow-growing palms have a bushy appearance when they are young.
- They are fairly hardy and are not overly particular about their growing conditions.
- It grows to heights of up to 30-50 feet and a width of around 12 feet.

Economic Importance -

- The ethanol extract of *Livistona chinensis* leaves showed a favourable antioxidant activity in our preliminary screening test.
- They are used to screen out antioxidants from the herb leaves further and evaluate their efficacy in acute myocardial ischemia treatment at the cellular level.
- The leaves of this plant are harvested from the wild and have been widely used to make fans in China.
- They are also used for manufacturing rain hats and coats, brooms etc.

Any Additional Feature -

- Chinese fan palms can tolerate a variety of soil types.
- These palms actually have some resistance to cold and frost and can survive temperatures as low as 15-20 degree Celsius.



Hyophorbe lagenicaulis

Plant Name - *Hyophorbe lagenicaulis* (Bottle palm)

Classification -

Kingdom - Plantae

Class - Monocotyledon

Order - Arecales

Family - Arecaceae

Genus - *Hyophorbe*

Species - *lagenicaulis*

Habitat -

- Temperature range - 25-30 degree Celsius.
- Direct / Indirect sunlight - Indirect sunlight.
- Humidity -50-60 %

Special Characteristics -

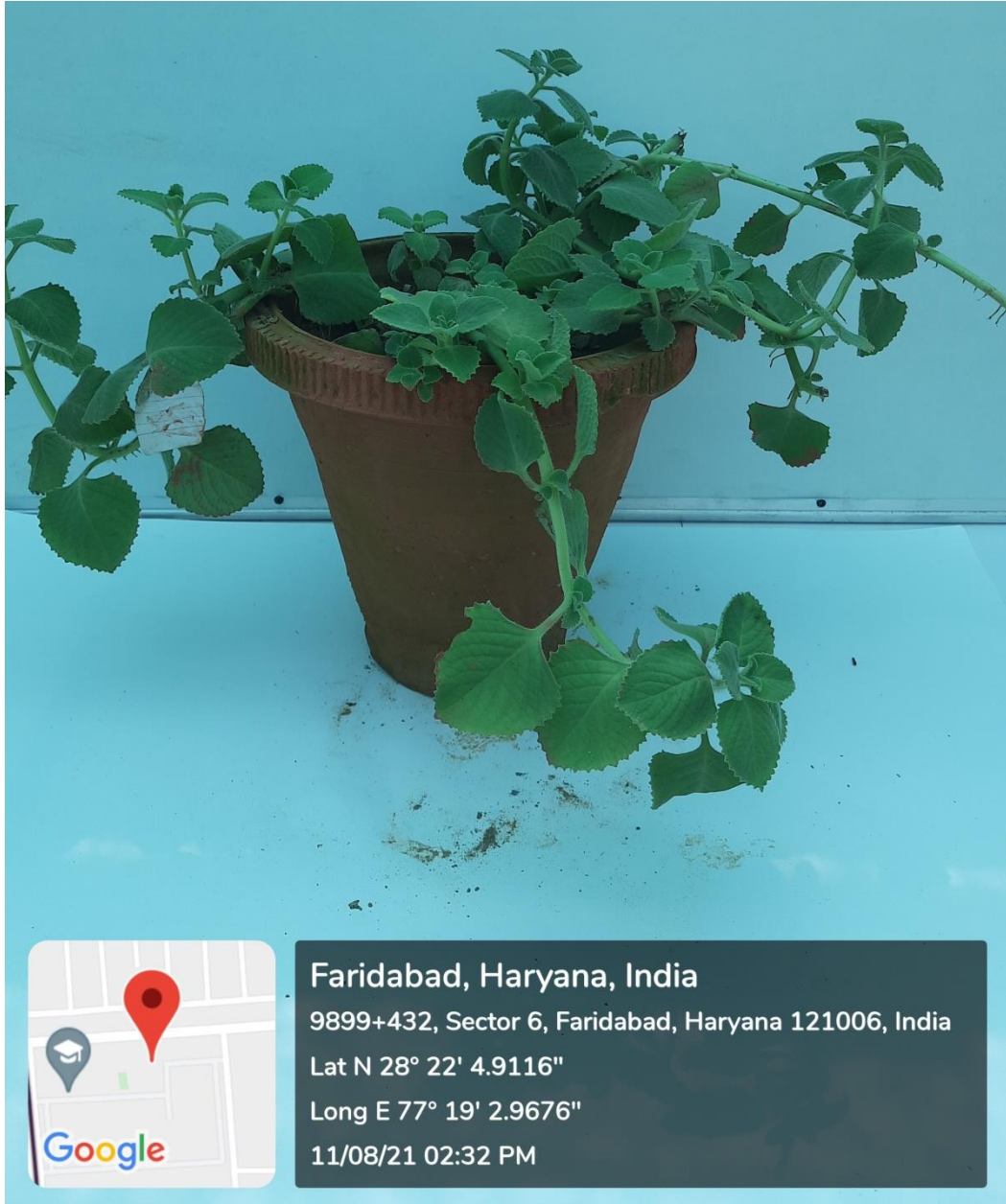
- Enlarge base; look like bottle, Showy, Evergreen.

Economic Importance -

- Ornamental and Medicinal values.

Any Additional Feature -

- *Hyophorbe lagenicaulis* is a species of tree in the family of palms. They have a self –supporting growth form. They are listed as critically endangered by IUCN. They have compound, broad leaves. Individual can grow to 7 meters.



Trachyspermum ammi

Plant Name – *Trachyspermum ammi* (Ajowan caraway, Thymol seed)

Classification –

Kingdom - Plantae

Class – Magnoliopsida

Order - Apiales

Family – Apiacea

Genus - *Trachyspermum*

Species - *ammi*

Habitat

- Temperature range – 15-25 degree Celsius.
- Direct / Indirect sunlight - Full sun to partial shade.
- Humidity – 60-70 %

Special Characteristics -

- Ajwain is erect, annual herb with soft fine hairs, height range from 70-90 centimeters. It has small, oval shape like seed with bitter and pungent smell.

Economic Importance -

- Ajwain seeds used in traditional Indian Ayurvedic medicine. It has antibacterial and anti-inflammatory effect, effective in treating peptic ulcers, acidity or common cold, reduce blood pressure and cholesterol.

Any Additional Feature -

- Ajwain is one of the important herb for Indian kitchen to make Indian cuisine tasty. It is used for making herbal tea known as Ajwain tea.



Hibiscus moscheutos

Plant Name - *Hibiscus moscheutos*

Classification- Kingdom - Plantae

Class - Magnoliopsida

Order - Malvales

Family - Malvaceae

Genus - *Hibiscus*

Species - *moscheutos*

Habitat –

- Grows in fresh, brackish and salt marshes and wetlands and prefers full to partial sun.
- Temperature range – 0 degree Fahrenheit during their dormancy. The rose mallow -Texas star cross, hardy hibiscus, tolerates temperatures to 30 degrees below 0 degree Celsius.
Direct / Indirect sunlight - Full sun (6 or more hours of direct sunlight a day). Partial shade (Direct sunlight only a part of the day (2-6 hours).
- Humidity - It thrives in humidity and need a constant temperature of 70-75 degree Celsius in the green house .

Special Characteristics -

- The flowers are large, conspicuous, trumpet-shaped, with five or more petals, colour from white to pink, red, blue, orange, peach, yellow or purple, and from 4–18 centimeters broad.

Economic Importance -

- It has been used medicinally in the form of tea to treat digestive and urinary tract inflammations.
- The principle economic use of *Malvaceas* plant is as a source of natural fibres, the family providing perhaps the world's 3 most important fibre crops. Plants of the family are also used for food, beverages, timber in traditional medicine and in horticulture.

Any Additional Feature -

- The most prominent feature of this plant in winter is its persisting seed heads, found at the apex of stems 6 feet tall. The fruit capsules split, or dehisce to reveal round, brown seeds approximately 1/4 - inches in diameter that lightly rattle when shaken and disperse easily.



Faridabad, Haryana, India

60, Sant Surdas Marg, Sector 11D, Pocket E, Sector 11, Faridabad,
Haryana 121006, India

Lat N 28° 22' 5.178"

Long E 77° 19' 1.8552"

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Thymus vulgaris

Plant Name - *Thymus vulgaris* (Garden Thyme)

Classification -

Kingdom - Plantae

Class - Magnoliopsida

Order - Lamiales

Family - Lamiaceae

Genus - *Thymus*

Species - *vulgaris*

Habitat -

- Temperature range - 20-30 degree Celsius.
- Direct / Indirect sunlight - Full sun.
- Humidity - 40-45%

Special Characteristics -

- Leaves are highly aromatic and have fine hairs.
- Contain high amount of flavonoids.

Economic Importance -

- It is used as culinary herb.
- It is used for curing various diseases.
- It is used as an easily available source of natural antioxidants and antibiotics in foodproducts and drugs.

Any Additional Feature -

- Tolerate drought, dry soil, shallow-rocky soil and air pollution.



Curcuma longa

Plant Name: *Curcuma longa* (Turmeric)

Classification:

Kingdom - Plantae
Class - Magnoliopsida
Order - Zingiberales
Family - Zingiberaceae
Genus - *Curcuma*
Species - *longa*

Habitat –

- Temperature range - 20-30 degree Celsius.
- Direct / Indirect sunlight - *Curcuma longa* grow in partial shade.
- Humidity - 70-80%

Special Characteristics -

- It is commonly known as turmeric. It is a tropical rhizomatous herbaceous perennial.
- It typically grows to 3-4 feet tall in foliage clump of ornamentally attractive cannalike, pleated, elliptical to lanceolate green leaves.

Economic Importance -

- It is used as condiment in every Indian household.
- It is used as coloring matter for foodstuffs.
- It has medicinal properties and used in preparation of cosmetics and Ayurvedic medicines.
- It is a very important cash crop.

Any Additional Feature -

- Turmeric can lower testosterone level and decrease sperm movement. This might reduce fertility.
- Turmeric contains a chemical called curcumin which might act like estrogen hormone.



Rauwolfia serpentina

Plant Name - *Rauvolfia serpentina* (The Indian snakeroot)

Classification -

Kingdom - Plantae

Class - Mangoliopsida

Order - Gentianales

Family - Apocynacea

Genus - *Rauvolfia*

Species - *serpentina*

Habitat -

- Temperature range - 10-30 degree Celsius.
- Direct / Indirect sunlight - Grow in full sun and light shade.
- Humidity - should exceed up to 40-50%

Special Characteristics -

- Peduncles are deep red and flowers are small, white or pinkish in color.
- It is evergreen, woody, glabrous and perennial shrub with maximum height up to 1 metre.

Economic Importance -

- Root extract is given in the treatment of diarrhea and dysentery.
- The drug is useful during child birth as it stimulates uterine contractions.

Any Additional Feature -

- It exerts a significant antagonistic effect on dopamine.



Faridabad, Haryana, India
60, Sant Surdas Marg, Sector 11D, Pocket E, Sector 11, Faridabad,
Haryana 121006, India
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Long E 77° 19' 1.884"
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Melissa officinalis

Plant Name - *Melissa officinalis* (Lemon balm)

Classification -

Kingdom - Plantae

Class - Magnoliopsida

Order - Lamiales

Family - Lamiaceae

Genus - *Melissa*

Species - *officinalis*

Habitat -

- Temperature Range - Plant can grow rapidly at the temperature from 15-35 degreeCelsius.
- Direct/ Indirect Sunlight - *Melissa officinalis* needs shade. Especially in areas in which the summer is hot, this plant grows best with some shade in the afternoon or in a spot where there are tall trees to lessen the intensity of the sun.
- Humidity - It grows best in slightly moist soil.

Special characteristics -

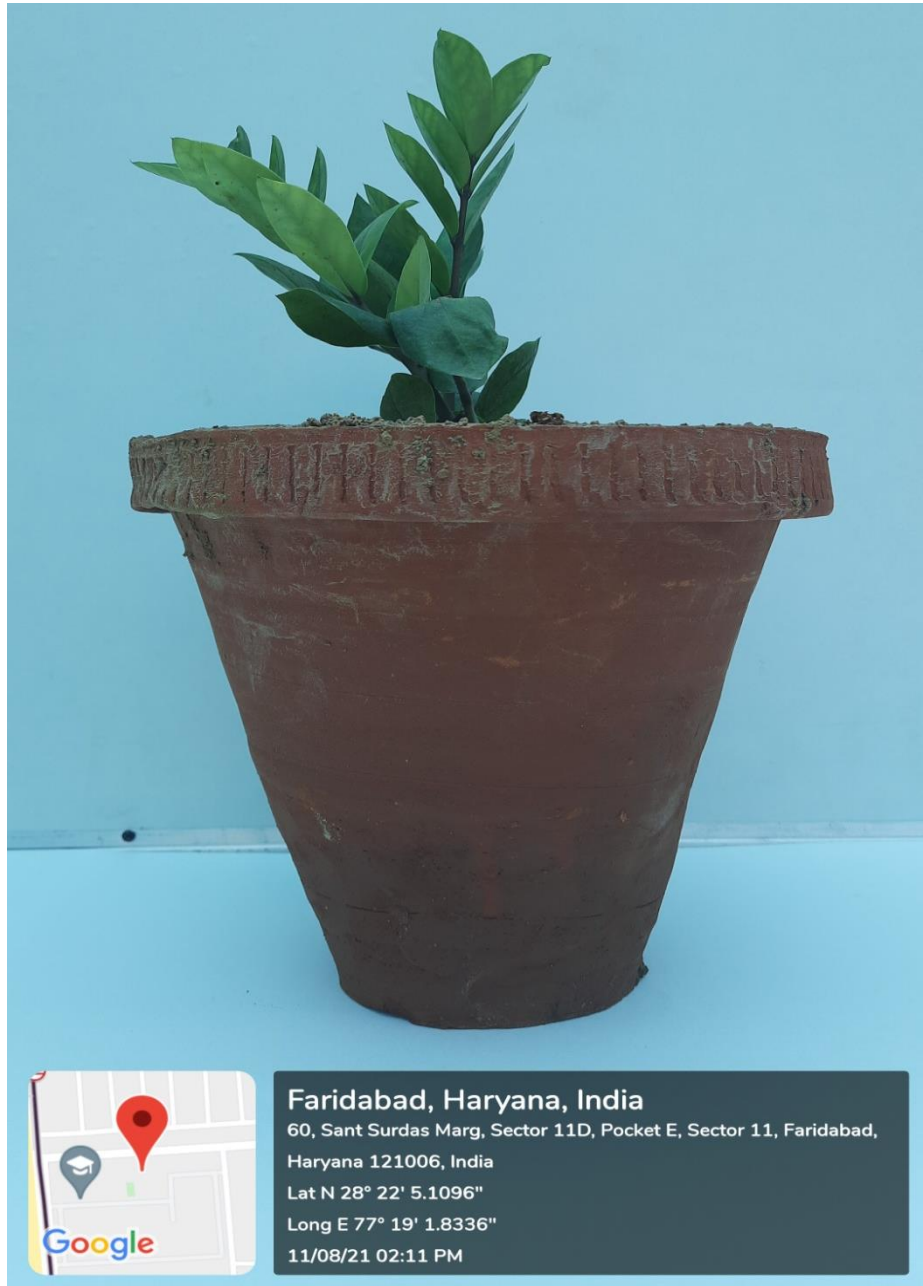
- Lemon balm is a 50-80 centimetres high perennial herb with a four-edged, branching, sparsely-haired stalk. The opposed leaves, whose stalked stems vary in length, are broadly oval to heart shaped and have an irregular crenate or serrate edge.
- Pale white labial flowers, which are approximately 1 centimetre in size, grows from the leaf axils in semi - verticils.

Economic importance -

- Lemon balm is also used medicinally as an herbal tea, or in extract form. It is claimed to have antibacterial, antiviral properties, and it is also used as a mild sedative or calming agent.
- The plant is grown and sold as an ornamental plant, and for attracting bees.

Additional features -

- Drought tolerant and can even be used in rock garden. Great specimen to plant in a pot as this limits its vigorous spreading habit as it tends to re-seed itself easily.



Ceasalpinia bonduc

Plant Name - *Caesalpinia bonduc* (Fever nut)

Classification -

Kingdom - Plantae
Class - Magnoliopsida
Order - Fabales
Family - Fabaceae
Genus - *Caesalpinia*
Species - *bonduc*

Habitat -

- Temperature range - 25-30 degree Celsius.
- Direct/Indirect sunlight - *bonduc* grows in full sun and is tolerant of shade, but can withstand areas with partial shade. Callus induction and shoot regeneration from epicotyl explants of ethnobotanically important *C. bonduc*.
- Humidity - 60-100% (Relative humidity required for the plant growth.)

Special characteristics -

- Yellow Nicker is a large, thorny, straggling shrub which behaves like a strong woody climber, taking support of trees.
- Leaves are large, double compound, with 7 pairs of pinnae, and each with 3-8 pairs of leaflets with 1-2 small recurved prickles between them on the underside.

Economic Importance -

- *C. bonduc* seeds have long been used in traditional medicine in treating symptoms and ailments, including abdominal pain, colic, leprosy, fever, edema, and malaria.
- It is also used as a uterine stimulant, and to cleanse the uterus during the postpartum period.

Any Additional feature -

- Antipyretic especially if used regularly.
- Seeds containing quinine. In malaria, seed powder + black pepper are given.
- Uterine stimulant, given after delivery, it involutes the uterus.



Tecoma stans

Plant Name - *Tecoma stans* (Trumpet bush)

Classification-

Kingdom - Plantae

Class - Tracheophytes

Order - Lamiales

Family - Bignoniaceae

Genus - *Tecoma*

Species - *stans*

Habitat -

- Temperature range - Grows generally in annual low temperature from 12 to 25 degreeCelsius, average annual high temperature from 23 to 34 degree Celsius.
- Direct / Indirect sunlight - Indirect sunlight.
- Humidity - Requires hot and humid conditions.

Special Characteristics -

- Showy flowers and Rapid growth.
- Versatile use - accent, mass planting, container planting, attracts humming birds, bees and butterflies.
- High heat and disease resistance.

Economic Importance -

- It provides firewood and charcoal.
- It's leaf infusion can be taken orally for diabetes and stomach pain.

Any Additional Feature -

- It is multi- stemmed.
- Evergreen ornamental shrub with tropical look.



Cymbopogon citratus

Plant Name - *Cymbopogon citratus* (Lemon grass)

Classification -

Kingdom - Plantae

Class - Liliopsida

Order - Poales

Family - Poaceae

Genus - *Cymbopogon*

Species - *citratus*

Habitat -

- Temperature range - average 24-30 degree Celsius.
- Direct / Indirect sunlight - bright but indirect sunlight.
- Humidity - prefer hot, humid weather.

Special Characteristics -

- Long slender foliage growing to about 2-3 feet tall.
- Leaves are grayish-green in color.

Economic Importance -

- They are widely used as a lemon flavour ingredients in herbal tea.
- The plant yields lemon grass oil of commerce after the hydro/steam distillation of leafy herbs. It is used as antiseptic and treatment for nervous and gastrointestinal disorder and fever.

Any Additional Feature -

- It is used to treat digestive problems and high blood pressure.
- Lemon grass essential oil is a popular tool in aromatherapy to help relieve stress, anxiety and depression.



Codiaeum variegatum

Plant Name - *Codiaeum variegatum* (Trishul croton)

Classification -

Kingdom - Plantae
Class - Dicotyledonae
Order - Malpighiales
Family - Euphorbiaceae
Genus - *Codiaeum*
Species - *variegatum*

Habitat -

- Temperature range - 18-27 degree Celsius
- Direct / Indirect sunlight - Indirect Light
- Humidity - 40-80%

Special Characteristics -

- An erect evergreen shrub with thick, large, leathery, glossy leaves that display an array of colors.
- Leaf forms are highly diverse in shapes and colors.

Economic Importance -

- A decoction of the crushed leaves is used in the treatment of diarrhoea.
- It is often grown as an ornamental in gardens, being especially valued for its vast range of variegated-leaf cultivars.

Any Additional Feature -

- This species may be poisonous if consumed in large quantities.
- The bark, roots, latex and leaves are poisonous, containing the toxin called 5-deoxyingenol.
- Chewing the bark and roots is said to cause burning of the mouth. The latex has caused eczema in some gardeners after repeated exposure.



Ficus retusa

Plant name - *Ficus retusa* (Fig tree)

Classification -

Kingdom - Plantae
Class - Magnoliopsida
Order. - Rosales
Family. - Moraceae
Genus - *Ficus*
Species - *retusa*

Habitat -

- Temperature range - 15-23 degree Celsius
- Direct/Indirect sunlight - Indirect sunlight
- Humidity - 40%

Special Characteristics -

- They have self-supporting growth form.
- They have simple broad leaves.
- Reproduction in monoecious.
- It can reach up to 10 meter in height.

Economic Importance -

- Figs are of paramount cultural importance throughout tropics as object of worships.
- Having medicinal value.
- Figs are cultivated ornamentals or a source of rubber and paper.

Any Additional Feature -

- The small size and thick trunk make it a decorative plant, one of the common bonsaitree.



Ficus benjamina

Plant Name: *Ficus benjamina* (Starlight / Weeping fig)

Classification -

Kingdom - Plantae
Class - Dicotyledonae
Order - Urticales
Family - Moraceae
Genus - *Ficus*
Species - *benjamina*

Habitat -

- Temperature range - 18-29 degree Celsius
- Direct/Indirect Sunlight - bright indirect sunlight
- Humidity - 60-80%

Special Characteristics -

- Good for Topiary, Hedges and Borders and it is recommended for creating shade.
- Weeping fig is Suitable for road median planting.

Economic Importance -

- *F. benjamina* Wood is suitable for making match- boxes.
- Bark is used for making ropes.
- Decoction of leaves is mixed with oil and applied to ulcers.

Any Additional Feature -

- Leaves simple, alternate, blade ovate to elliptic, 4-12 centimeters long (1 5/8-5 inch), typically light green, finely veined, with a sharp or attenuate tip.
- Fruits can be found on the tree throughout the year. Fruit an orange, red, pink or purple, subglobose synconium 7-12 millimeter long (1/4-1/2 inch), paired in the leaf axils.



Cordyline terminalis

Plant Name - *Cordyline terminalis mahatma* (Dracaena mahatma)

Classification -

Kingdom - Plantae
Class - Monocotyledon
Order - Asparagales
Family - Asparagaceae
Genus - *Cordyline*
Species - *mahatma*

Habitat -

- Temperature range - 16-32 degree Celsius
- Direct / Indirect sunlight - Indirect sunlight
- Humidity - 60-80%

Special Characteristics -

- Best air purifying plant eliminating formaldehyde, benzene and carbon dioxide.
- Also used in landscaping.
- It is hardy drought tolerant.

Economic Importance -

- Widely used for ornamental purpose because this plant has beautiful slender greyishgreen leaves with colorful margins tinted with hues of red across the leaves.

Any Additional Feature -

- It is easy to grow, require minimal care.
- This plant requires well drained soil rich in organic content.
- The leaves are toxic if eaten by pets.



Aloe barbadensis miller

Plant Name - *Aloe barbadensis miller* (Aloe vera)

Classification –

Kingdom - Plantae
Class - Liliopsida
Order - Asparagales
Family - Asphodelaceae
Genus - *Aloe*
Species - *vera*

Habitat -

- Temperature range - 13-27 degree Celsius
- Direct/Indirect sunlight - Indirect sunlight
- Humidity - No extra humidity is required, can handle dry air.

Special Characteristics -

- The plant has triangular, fleshy leaves with serrated edges, yellow tubular flowers and fruits that contain numerous seeds.
- Each leaf is composed of three layers-
- An inner clear gel that contains 99% water and rest is made of glucomannans, amino acids, lipids, sterols and vitamins.
- The middle layer of latex which is the bitter yellow sap and contains anthraquinones and glycosides.
- The outer thick layer of 15–20 cells called as rind which has protective function and synthesizes carbohydrates and proteins.
- Inside the rind are vascular bundles responsible for transportation of substances such as water (xylem) and starch (phloem).

Economic Importance -

- The cosmetic, pharmaceutical, and food industries use *Aloe vera* extensively, and the plant has an estimated annual market value of \$13 billion Trusted Source globally.
- It has antioxidant and antibacterial properties.
- It helps treat canker sores.
- It reduces constipation.
- It may improve skin and prevent wrinkles.
- It accelerates wound healing.

Any Additional Feature -

- Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.
- Vitamins: It contains vitamins A (beta-carotene), C and E, which are antioxidants. It also contains vitamin B12, folic acid, and choline.



Dracaena trifasciata

Plant name - *Dracaena trifasciata*

Classification-

Kingdom: Plantae

Class: Magnoliopsida

Order: Asparagales

Family: Asparagaceae

Genus: *Dracaena*

Species: *D. trifasciata*

Habitat -

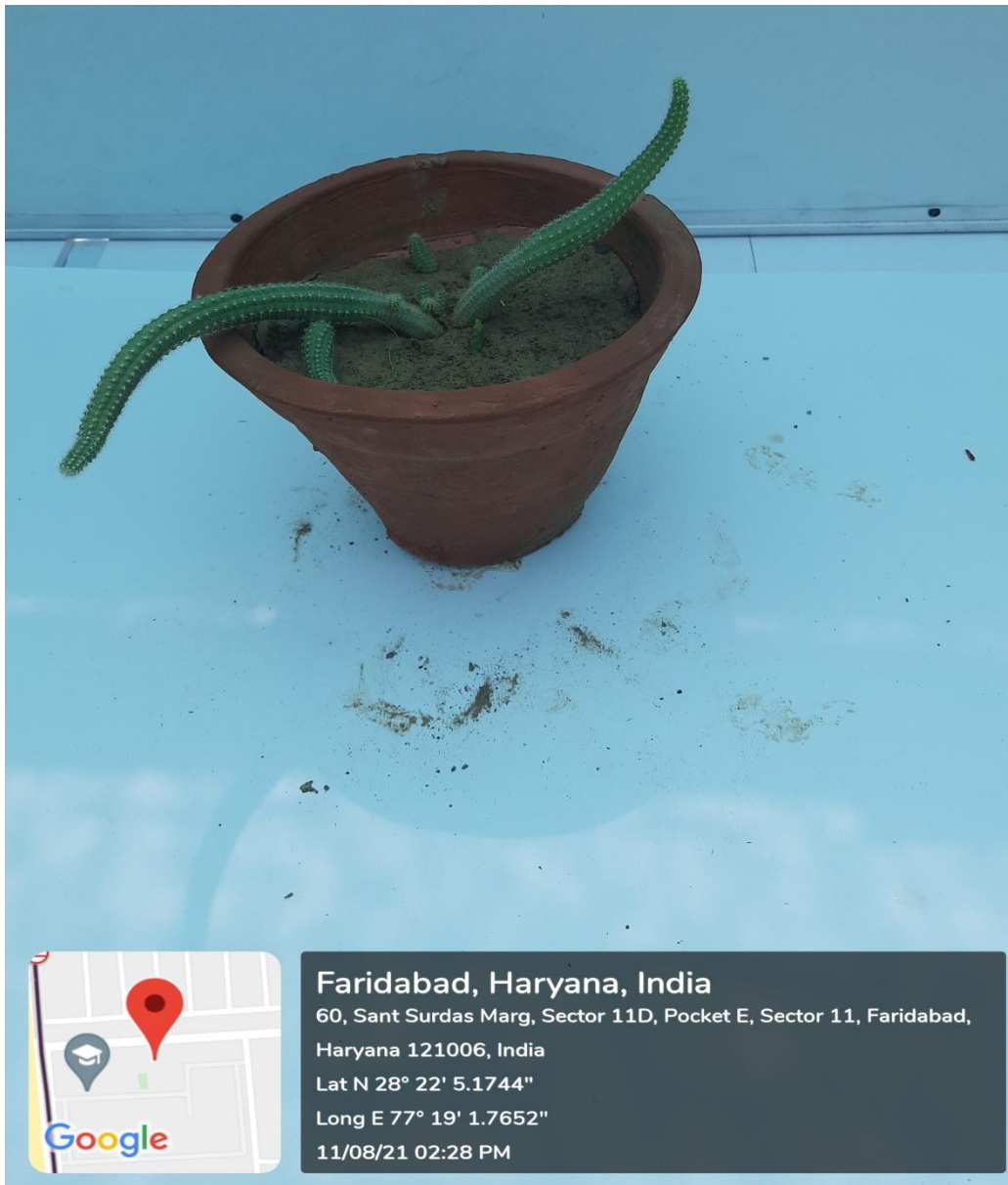
- Temperature range between 70°F and 90°F (21°C – 32°C).
- This *Dracaena* species doesn't need extra humidity.
- Requires bright light or partial shade to grow well.

Special characteristics-

- *Dracaena trifasciata* or snake plants grow faster when it's warm, and there is plenty of bright light.
- It is a perennial flowering plant that blooms in spring.
- Its stiff leaves grow vertically upward, giving the plant its unique appearance.

Economic importance –

- It requires low maintenance.
- Removes air pollutants like formaldehyde, benzene, xylene, etc.,.
- Absorbs carbon dioxide at night.
- It is very effective against allergies.
- A great oxygen producing house plant.



Aporocactus flagelliformis

Plant name- *Aporocactus flagelliformis*

Classification:

Kingdom: Plantae

Class: Dicotyledoneae

Order: Caryophyllales

Family: Cactaceae

Genus: Cactoideae

Species: *A. flagelliformis*

Habitat –

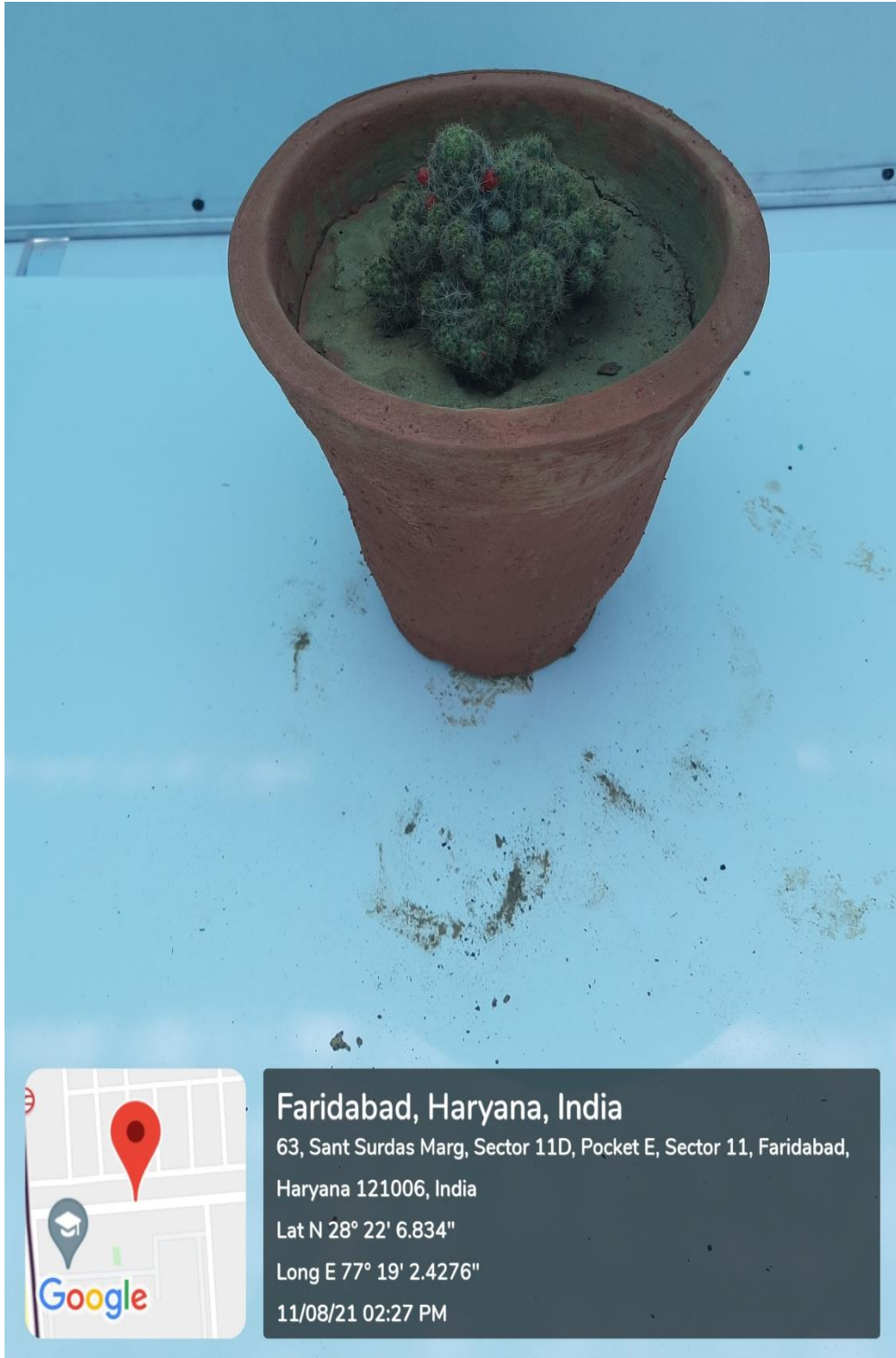
- *Aporocactus flagelliformis* is lithophytic or epiphytic cactus native to southern Mexico and Central American deserts.
- In its natural habitat is found trailing or pendent, often epiphytic over rocks or up in trees.
- Requires direct sunlight.
- Tolerate temperatures up to 15-16°C (59-61°F).
- Requires plenty of water during active growth period and low humidity.

Special characteristics-

- *Aporocactus flagelliformis* is an epiphytic cacti which has pendant stems that can grow up to 1.5m (5 feet) long and 2cm (0.8 inch) thick in course of only five years.
- Tubular, crimson-pink flowers about 5cm (2 inch) long and 2.5cm (1 inch) wide appears on mature growth.
- The stems are covered in short, bristly spines coloured yellow-brown, aging to a grey shade.

Economic importance-

- An ornamental plant.
- Very easily propagate.
- Drought resistant and can survive longer periods with little care.



Mammillaria elongata

Plant name- *Mammillaria elongata*

Classification:

Kingdom: Plantae

Class : Magnoliopsida

Order: Caryophyllales

Family: Cactaceae

Genus: Mammillaria

Species: *M. elongata*

Habitat –

- Requires direct light.
- The optimum temperature range is between 18-30 ° C.
- Very drought resistant.

Special characteristics –

- They are small cacti that form very branched groups of creeping bearing up to 15 cm in length.
- Its body is rather cylindrical, of intense green color and is characterized by forming thin tubular stems of approximately 2.5 cm in diameter.
- The flowers are white or yellowish, the petals have a medium reddish-brown line; each petal has a serrated margin and a rounded or sharp apex.
- Very susceptible to root rot due to stagnation of water in the substrate.

Economic importance-

- Horticultural value.
- Do not require much water to grow.
- Can tolerate several environmental conditions.



Stapelia gigantea

Plant name- *Stapelia gigantean*

Classification:

Kingdom: Plantae
Class: Magnoliopsida
Order: Gentianales
Family: Apocynaceae
Genus: Stapelia
Species: *S. gigantea*

Habitat-

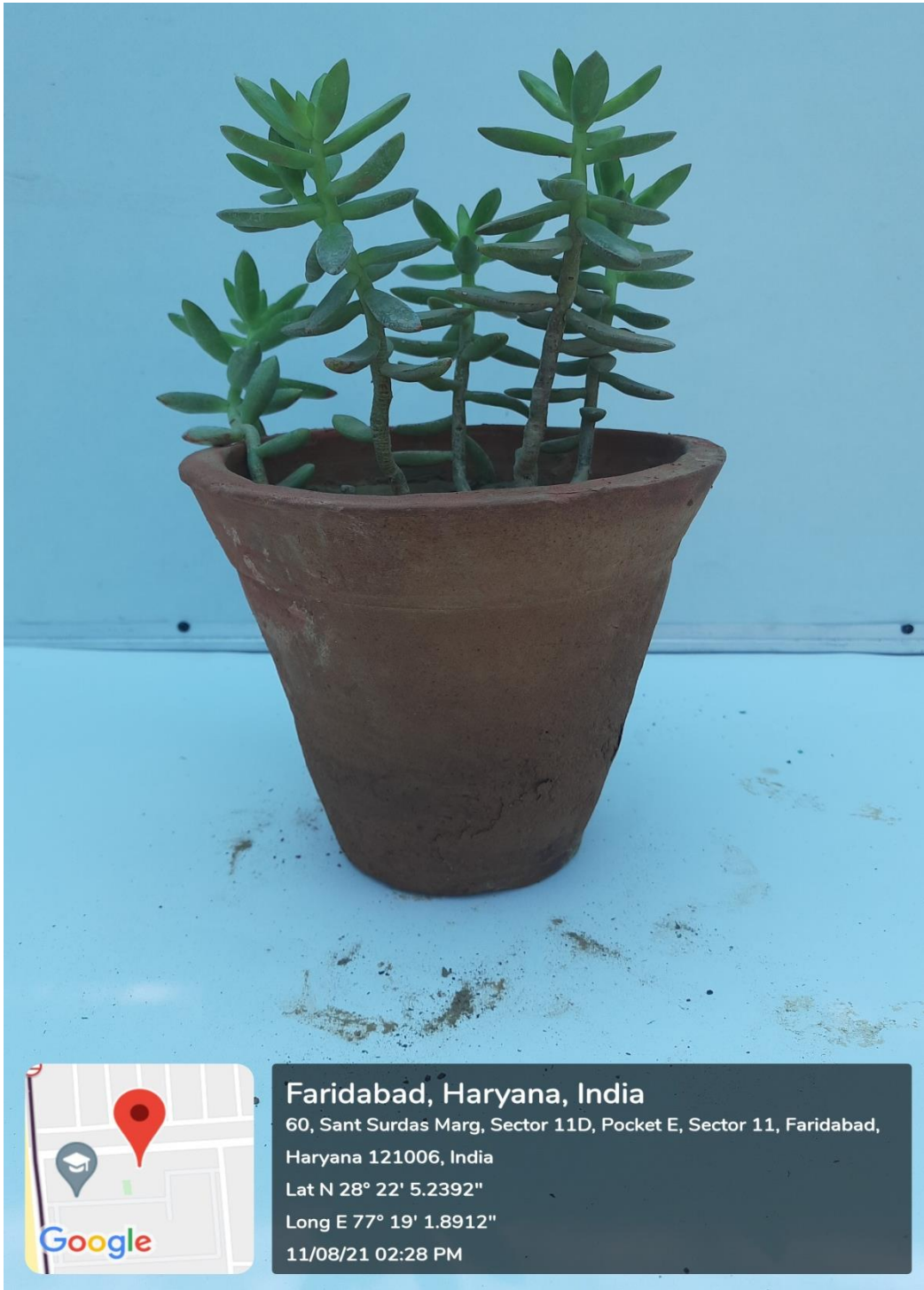
- Plants commonly grow in arid and sparsely vegetated areas and on rocky outcrops.
- Grow in warm and dry places.
- Develop back spot and other fungal diseases when the temperature is too low or when the moisture is very high.

Special characteristics-

- *Stapelia gigantea* has the largest flowers (up to 40 cm across) of any plant in our region and is one of the easiest stapeliads to grow.
- This is a very variable species, with erect, succulent, perennial stems, up to 25 cm tall, branching strongly from the base and spreading vegetatively.
- Stems are usually green but may turn reddish-purple when exposed to direct sunlight.
- Flowers have a strong, unpleasant scent.
- Plants occupy a wide diversity of habitats, mostly in arid areas. It is not uncommon to see flowers covered with the eggs of flies that were deceived by the odour and thus laid their eggs around the fleshy corona, convinced that it would be a food source for their hatching larvae.

Economic importance-

- Has many medicinal and cultural (magic) uses and is traditionally used as an emetic to treat hysteria, but also has analgesic and purgative effects.
- It is also used to treat pain of bruised skin by rubbing ash from burnt plants into the wounds.
- Crushed stems are used, mixed with various other plants, as a proactive charm and sprinkled on family members to protect them from the 'pollution' of visitors.
- This is also one of the species planted near homesteads to ward off lightning.
- Plants are apparently also traditionally used as poison that may lead to death.



Sedum rubrotinctum

Plant name: *Sedum rubrotinctum*

Classification:

Kingdom: Plantae

Class : Dicotyledonae

Order: Saxifragales

Family: Crasulaceae

Genus: Sedum

Species: *S. rubrotinctum*

Habitat-

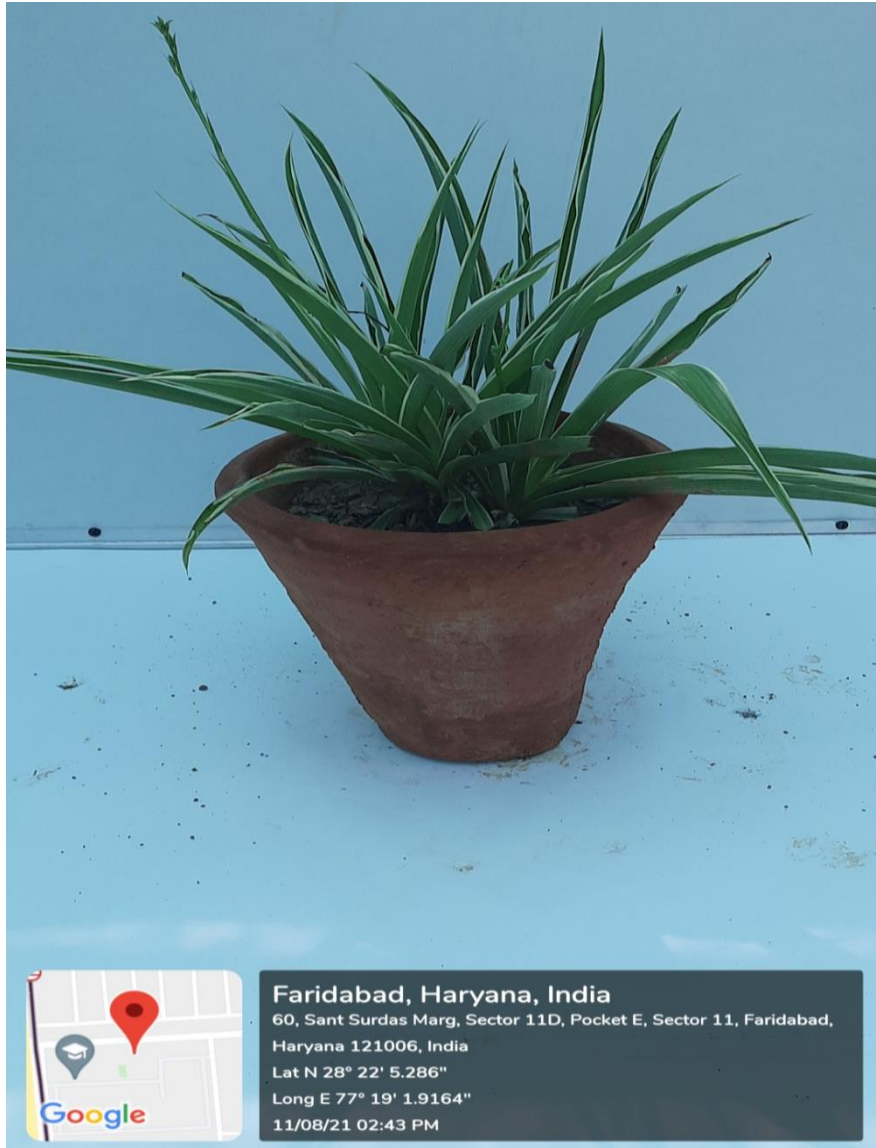
- Wet soil for long periods of time will promote root rot.
- Requires bright light for good growth.
- Low moisture.

Special characteristics –

- Leaves look like jelly beans and the color of the leaves are changing from green to red during the summer.
- This plant is classified as a hybrid plant.
- It will approx. grows up to 15 cm tall and spreads up to 90 cm.

Economic importance-

- The usage of these plants is for groundcover, container, house plant and rock garden.
- Heat and drought tolerant, succulent, and are of foliage interest.
- Ornamental use.



Yucca filamentosa

Plant name- *Yucca filamentosa*

Classification:

Kingdom: Plantae

Class : Magnoliopsida

Order: Asparagales

Family: Asparagaceae

Genus: *Yucca*

Species: *Y. filamentosa*

Habitat-

- Woodlands, forests, dunes, roadsides, disturbed areas.
- Prefers coarse sandy soil that is well-drained but tolerates other soil types.
- It prefers full sun but tolerates partial shade.

Special characteristics-

- The sword-shaped leaves are evergreen with thread-like filaments curling along the edges and sharp pointed tips.
- The tall panicle of white bell-shaped flowers is very lovely in late spring to early summer.
- In areas of poor drainage, the leaves may be sensitive to leaf spot or blight.
- The plant can tolerate strong winds but not maritime exposure.

Economic importance-

- Fruit and flower have edible uses.
- Medicinal use in treatment of sore, skin diseases and sprains.
- Fibre obtained from leaves is used to make robe, paper, cloth, basket and mats.



Agave americana

Plant name- *Agave americana*

Classification:

Kingdom: Plantae

Class : Magnoliopsida

Order: Asparagales

Family: Asparagaceae

Genus: Agave

Species: *A. americana*

Habitat-

- It can grow in a wide range conditions, including cliffs, urban areas, woodlands, grasslands, riparian zones, beaches and sandy areas, and rocky slopes.
- Tolerant of wind, salt, high temperatures, and extreme drought. It can grow in shallow, very dry, low fertility soil and can colonise bare sand

Special characteristics-

- A large and stemless succulent, with leaves that can grow up to 2 m.
- Leaves are robust and spear-like, and are in a basal rosette. The leaves have sharp hooks or spines on the edges, and very sharp tips.
- Leaves have stomata which open at night, taking in carbon dioxide.
- Flowers are yellow and occur rapidly after maturity, when the plant is 10 - 15 years old.
- Flowers are at the top of a long stalk (up to 10 m), and are branched, candelabra-like, from the main stalk. These are followed by seed capsules with seeds (black, 5 cm long).
- The plant dies after fruiting.

Economic importance-

- Ornamental use
- Medicinal use as a vertebrate poison
- Agricultural, fodder
- erosion control
- Fibres derived from *A. americana* have been shown to be more extensible than other natural fibres, and also exhibit high tensile strength and are low density and have a high moisture content.



Epipremnum aureum

Plant name: *Epipremnum aureum*

Classification:

Kingdom: Plantae

Class : Magnoliopsida

Order: Alismatales

Family: Araceae

Genus: Epipremnum

Species: *E. aureum*

Habitat-

- Prefer indirect or curtain- filtered sunlight.
- Normal room temperature is good for their growth.
- Low humidity.
- Less water requirement.

Special characteristics-

- It is a climbing vine that produces abundant yellow-marbled foliage.
- In its native habitat, it climbs tree trunks by aerial rootlets and tumbles along the ground as a ground cover, reaching up to 40' or more in length.
- Young plants feature bright, waxy, heart-shaped green leaves (to 4" long) that are variegated with yellow or white.
- On large mature vines, however, the leaves become much larger (to 30" long) with deep lobes.
- The plant is somewhat suggestive of philodendron. All parts of this plant are poisonous if ingested.

Economic importance-

- Good houseplant for sun to part-sun areas.
- Suitable for use in hanging baskets or trained to grow up a trellis or other support structure.