SIES College of Arts, Science & Commerce (Autonomous)
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NAAC REACCREDITED - 'A' GRADE

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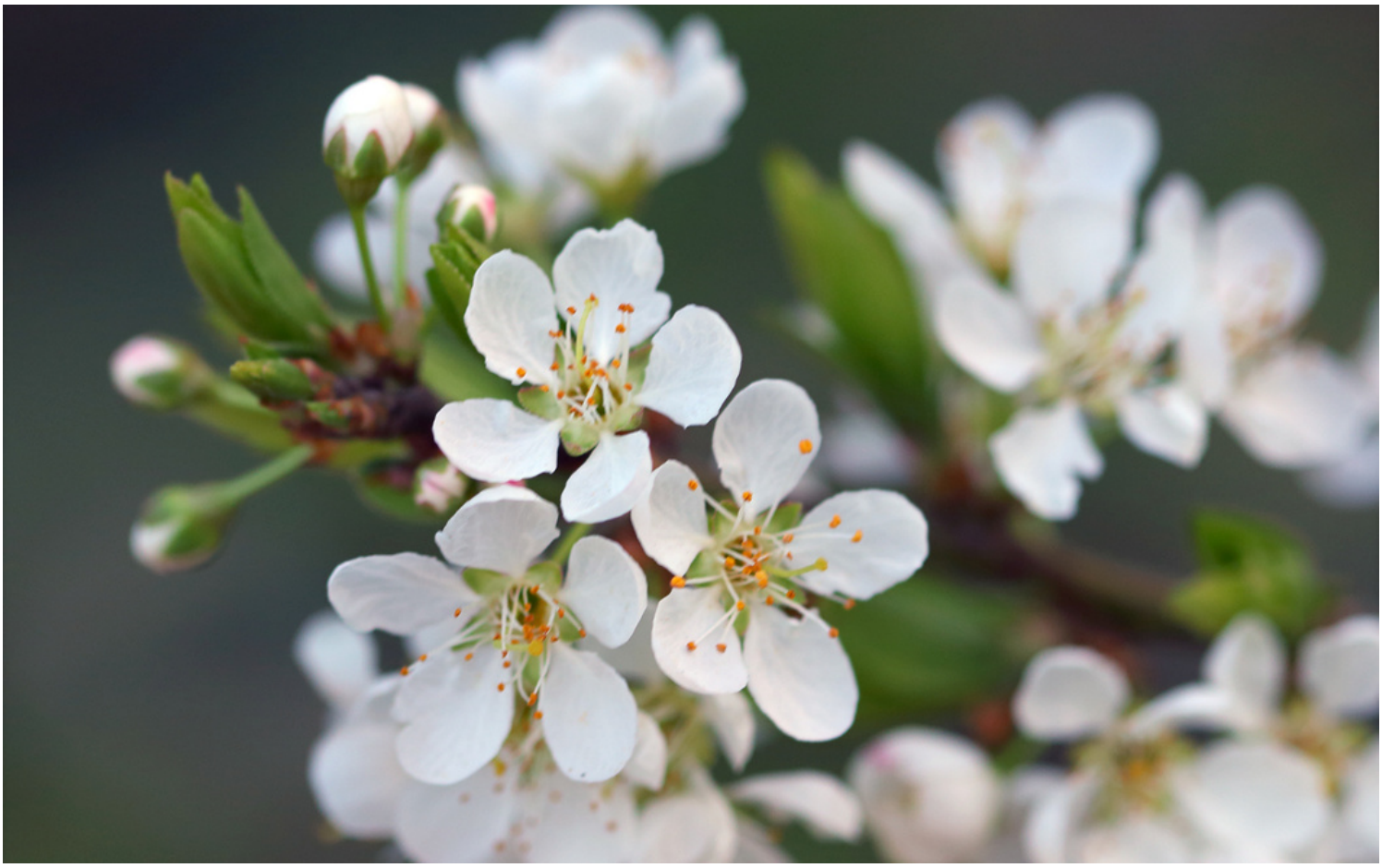
The Department of Botany presents

GULMOHAR

GULMOHAR NEWSLETTER



FROM THE EDITOR'S DESK

By Raghavi Vasanth Kumar
T.Y.B.Sc.

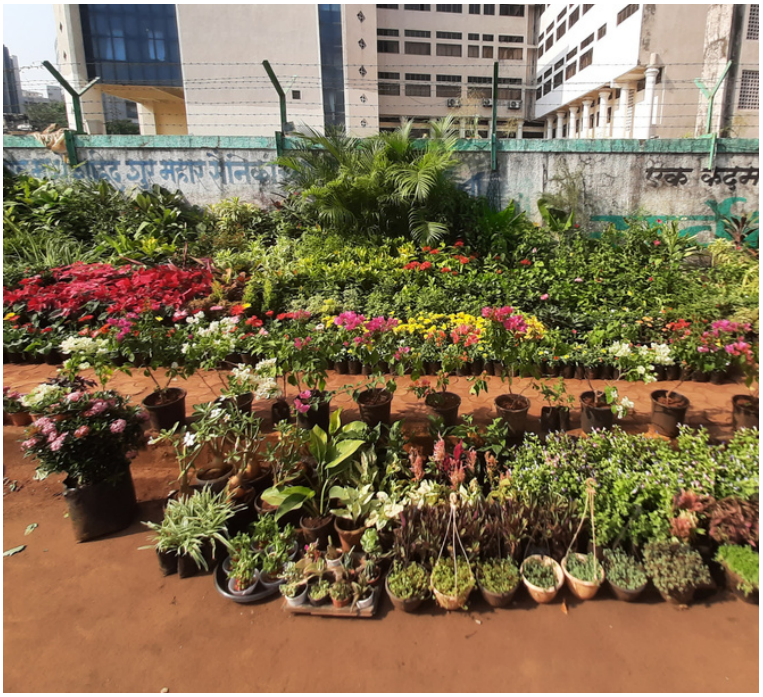
Welcome to a new edition of the Gulmohar newsletter for the year 2021-22. In this edition, we have put up some fascinating articles and photographs.
In this edition, we have an article about the roadside nursery as well as a recipe for a healthy brew of fennel tea. Did you know about the recently discovered carnivorous plant? If not then read our article on it. In our next article learn more about natural cosmetics and their benefits. Up next, we have an article on the gene that helps plants to sustain themselves. We also have an article that discusses various institutions where you can pursue higher education in the subject of Botany. Finally, yet importantly, we have some fun facts and a photo gallery to showcase the photography skills of the students.

HAPPY READING!

WHAT'S IN THIS ISSUE

VISIT TO A ROADSIDE NURSERY

Location - Behind Mumbai University, Kalina, Santacruz (East)



Buying plants from your area might feel unpleasant sometimes because of the high-priced and fewer varieties of plants. Therefore, Nursery is a great place to buy plants.

As the lane begins, you will see a line of nurseries fringed on both sides of the road. They have indoor house plants, outdoor plants, any material you may need to start a garden, herbs, ferns, and even brightly colored planters. If you want to buy succulents and cacti, they have them too. Special mention about the ceramic pots, they have such beautiful collections at a lower price.

While most of the retailers are unskilled workers, they do understand their plants. If you are a beginner, you can ask them what kind of care each plant needs, and they will be happy to help. Do remember to have some sort of vehicle with you to load up if you are planning to pick more than a couple of plants, or if you don't have any vehicle, you can take an autorickshaw from there.

Plants that are of great attraction or not commonly seen like a wild red-colored petaled rose plant, *Euphorbia*, Portulaca (*Portulaca oleracea*), Ornamental cabbage (*Brassica oleracea*), *Graptopetalum mendozae*, ferns, varieties of succulents.

They also have many flowering plants like Gerbera, Rosa, Marigold (*Tagetes*), Dianthus, Hibiscus (*Hibiscus rosa-sinensis*), Petunia, Anthurium (*Anthurium andraeanum*), Gazania, Pentas (*Pentas lanceolata*), Ixora (*Ixora coccinea*), *Torenia*, Cosmos, Passion flower.

Indoor plants like Snake plant, Aloe Vera, Lucky Bamboo Plant (*Dracaena braunii*), *Nephrolepis* (Ferns), Chinese Evergreen (*Aglaonema commutatum*), Areca palm (*Dypsis lutescens*), Money Plant (*Epipremnum aureum*), Green Spider Plant (*Chlorophytum comosum*), Jade Plant (*Crassula ovata*), Asparagus Fern (*Asparagus aethiopicus*), Kalanchoe and Coleus (*Coleus scutellarioides*), etc.

The above information provides all the details about the roadside nursery!

AUTHOR: RAGHAVI VASANTH KUMAR

REFERENCE: www.whatshot.in

HEALTHY RECIPE (Fennel Tea)

Fennel (Saunf)

Family : Apiaceae

Scientific Name : ***Foeniculum vulgare***

Fennel tea is worth drinking for its pleasant aroma and soothing flavour. It is a common spice from the Indian kitchen that has amazing health benefits.

Tips to make Fennel Tea:

1. Select the perfect fennel seeds, sold in sealed packets to ensure a pleasing aroma.
2. Do not go for grey fennel seeds as they are very mature and likely lose their flavour.
3. Crush the fennel seeds with mortar and pestle and add it to warm water.
4. The seeds have a high content of essential oil, which seeps into the water. Allow the seeds to stay for about 10-20 minutes.
5. Your soothing tea is ready!

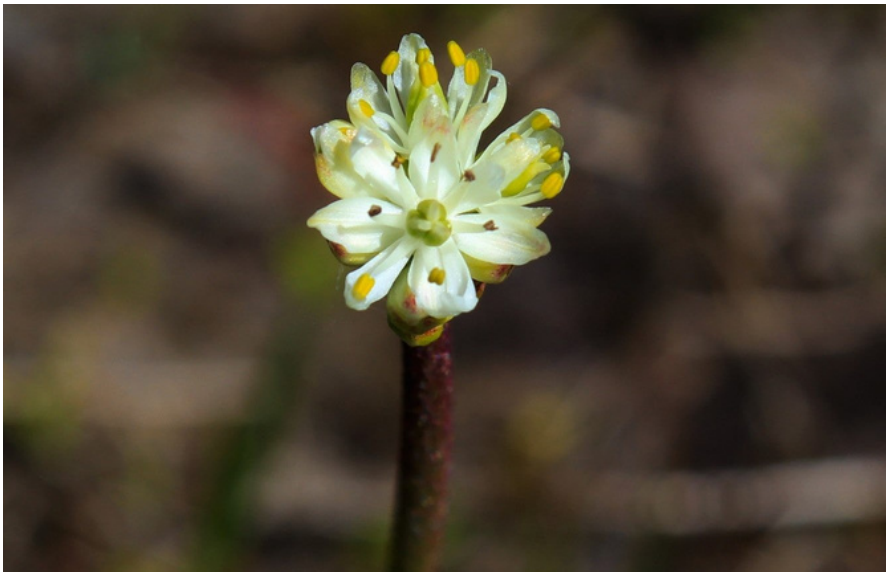
Benefits of Saunf Tea:

1. Drinking tea every day is beneficial for people who lack time to take care of their body.
2. It is a perfect digestive cleanser, very effective in relieving constipation.
3. Fennel seeds are generally had after meals to aid digestion and have a carminative effect on the intestine.
4. The tea helps to reduce flatulence by eliminating undigested food from the colon.

AUTHOR: NADAR JEBA RESHMA

REFERENCE: m.tarladalal.com

THE WORLD'S NEWEST CARNIVOROUS PLANT



An unassuming herb found on the western coast of North America known as *Triantha occidentalis*, or western false asphodel, has now joined the ranks of carnivorous plants.

This common herb is one of only two carnivorous plants to be identified in the past two decades. Its newfound status suggests that other unrecognized meat-eaters may also be growing near major cities.

“The plant’s been known for a long time, but it’s never been understood that it’s a carnivore,” says Sean Graham, a botanist at the University of British Columbia in Vancouver and co-author of the new findings.

It belongs to a family with no previous evidence of carnivory but often grows near known carnivorous plants such as sundews and butterworts. The flowering stems of *T. occidentalis* can grow to about two-and-a-half feet tall during summertime and are lined with reddish hairs covered in shiny secretions. This character was neglected by the scientist to prove the plant as a carnivore as sticky secretions are usually a defence system developed among various plants.

A reason why *T. occidentalis* escaped notice until now: Its traps aren’t as striking and elaborate as those boasted by other carnivorous plants such as Venus flytraps.

The first sign that the species might have a carnivorous lifestyle came when a colleague of Graham’s noticed that *T. occidentalis* is missing a gene involved in photosynthesis that’s also absent in a number of carnivorous plants.

The researchers fed captive fruit flies a rare form, or isotope, of nitrogen known as nitrogen-15.

The researchers then stuck the flies to the leaves or stems of *T. occidentalis*, a carnivorous sundew, and a non-carnivorous plant from the daisy family known as wandering fleabane.

“The key thing here is to prove that the nutrients have come from the dead animals and been incorporated into the plant’s body,” suggests Graham. Unsurprisingly, the presence of fruit flies seemed to have no effect on the amount of nitrogen-15 in the fleabane. However, the proportion of nitrogen-15 in both the sundew and *T. occidentalis* increased substantially after the plants had been presented with flies.

Additionally, the researchers observed, the sticky hairs on the stalks of *T. occidentalis* secrete a digestive enzyme called phosphatase that’s also found in other carnivorous plants.

The findings suggest that *T. occidentalis* uses its glistening hairs to lure and ensnare insect snacks. Bizarrely, however, these hairs are located very near *T. occidentalis*’s flowers. “That’s really weird, and it’s pretty much unheard of to have the trap close to the flower,” Graham opines.

Most carnivorous species keep a healthy distance between their meat-eating bits and the parts of the plant that must be pollinated by insects. However, Graham is of opinion that *T. occidentalis* probably isn’t putting its own pollinators at risk. The hairs only trap very small flies and beetles, rather than the larger, stronger bees and butterflies responsible for pollinating the plant.

Graham concludes that still many questions remain unanswered about *T. occidentalis.* He and his team are sequencing the plant’s genome to search for features related to carnivory.

EDITED BY: NADAR JEBA RESHMA AND TRISHIK JOGI

SOURCE: www.popsci.com

NATURAL BEAUTY PRODUCTS

1. TURMERIC (***Curcuma longa***):

Turmeric contains antioxidants and anti-inflammatory components. These characteristics may provide glow and luster to the skin. Turmeric eliminates free radicals that damage the skin and enhances collagen production that helps keep the skin supple and fresh.

Directions to use: Mix about half a teaspoon of turmeric powder with a tablespoon of yogurt. Add a few drops of lemon juice and mix well to form a smooth paste. Now, add a few drops of rose water and remix it. Apply this paste on your face and neck and leave it on till it dries. Then, rinse with cool water.

2. BEETROOT (***Beta vulgaris***):

Beetroot is high in iron and vitamins. It is fiber-rich food and contains an amino acid called betaine & vitamin C. It has beneficial effects on skin cells and has bleaching properties, and is often added in lip balms to give you perfectly tinted lips. Apart from making your lips rosy pink, it will also moisturize and nourish your lips.

Directions to use: Slice a beetroot and store it in the refrigerator. After a few minutes, rub it on your lips for a few minutes. Wash off after 15-20 minutes and watch your lips lighten to rosy pink.

We can also drink the juice to clear the blood and body off the toxins for glowing skin. And also, applying this juice to the skin helps flake off the dead cells accumulated onto the skin and make the skin shine.

3. TOMATO (***Solanum lycopersicum***):

Tomatoes are high in lycopene that combats cell damage, skin inflammation and helps in shrinking large pores, curing acne, treating sunburn, and rejuvenating dull skin. Its extract is widely used in many lotions, sunscreen, and skincare products, making it one of the best plants with cosmetic uses on the list.

Directions to use: Tomato has astringent properties that help reduce pore size. Thus you can make a skin toner by mixing one teaspoon of tomato juice with one cucumber juice. Apply this liquid on your face with a cotton ball, rinse with water after 15 minutes and apply a non-greasy moisturizer.

4. HIBISCUS (***Hibiscus rosa-sinensis***):

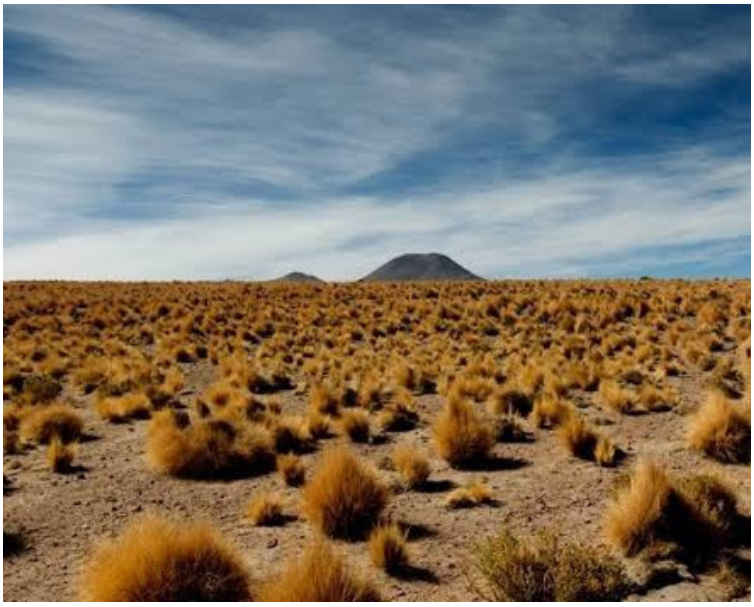
Hibiscus plants are rich in amino acids, antioxidants, and oligopeptides that help in reducing fine lines and wrinkles from the skin, doing an anti-aging effect. Also, the leaves and flowers are suitable for hair care. The flowers are used in the preparation of many skin and hair nourishment products.

Directions to use: Hibiscus leaf is a natural hair conditioner, as it contains 'mucilage polysaccharides.' Take 15-20 leaves, and boil them. Apply the water to your hair for two weeks for reduced hair fall and increased shine.

AUTHOR : PRIYA RAJU AMBATOR

REFERENCE: balconygardenweb.com, researchgate.com, bollywoodshaadis.com

GENETIC GOLDMINE- GENE THAT ENABLES PLANTS TO SURVIVE HARSHEST ENVIRONMENT ON EARTH



"In an era of accelerated climate change, it is critical to uncover the genetic basis to improve crop production and resilience under dry and nutrient-poor conditions," said Gloria Coruzzi, Carroll & Milton Petrie Professor in the New York University (NYU) Department of Biology and Center for Genomics and Systems Biology, who co-led the study with Rodrigo Gutiérrez.

"Our study of plants in the Atacama Desert is directly relevant to regions around the world that are becoming increasingly arid, with factors such as drought, extreme temperatures, and salt in water and soil posing a significant threat to global food production," which could ultimately help to enhance crop growth and reduce food insecurity said Gutiérrez, professor in the Department of Molecular Genetics and Microbiology at Pontificia Universidad Católica de Chile.

Establishing a "natural laboratory" in one of Earth's driest places

The Atacama Desert in northern Chile, sandwiched between the Pacific Ocean and Andes Mountains, is the driest place on the planet (excluding the poles). Yet dozens of plants grow there, including grasses, annuals, and perennial shrubs. In addition to limited water, plants in the Atacama must cope with high altitude, low availability of nutrients in the soil, and extremely high radiation from sunlight.

The Chilean research team established an unparalleled "natural laboratory" in the Atacama Desert over a 10-year period, in which they collected and characterized the climate, soil, and plants at 22 sites in different vegetational areas and elevations (every 100 meters of altitude) along the Talabre-Lejía Transect. Measuring a variety of factors, they recorded temperatures that fluctuated more than 50 degrees from day to night, very high radiation levels, soil that was largely sand and lacked nutrients, and minimal rain, with most annual rain falling over a few days.

Using genomics to explore the evolution of resilient plants

The Chilean researchers brought the plant and soil samples—preserved in liquid nitrogen—1,000 miles back to the lab to sequence the genes expressed in the 32 dominant plant species in the Atacama and assess the plant-associated soil microbes based on DNA sequences. The study identified 265 candidate genes whose protein sequence changes were selected by evolutionary forces across multiple Atacama species. These adaptive mutations occurred in genes that could underlie plant adaptation to the desert conditions, including genes involved in response to light and photosynthesis, which may enable plants to adapt to the extreme high-light radiation in the Atacama.

What one can learn from this "genetic goldmine"

By studying an ecosystem in its natural environment, the scientists were able to identify adaptive genes and molecular processes among species facing a common harsh environment. Most of the plant species they characterized in this research have not been studied before.

As some Atacama plants are closely related to staple crops, including grains, legumes, and potatoes, the candidate genes they identified represent a genetic goldmine to engineer more resilient crops, a necessity given the increased desertification of our planet.

EDITED BY : RUDRA PATRA
SOURCE: sciencedaily.com

INSTITUTIONS FOR HIGHER STUDIES IN BOTANY

After completing graduation in botany, many aspirants will be looking for an M.Sc. Botany course. M.Sc. Botany course is best suited for botany students. Various post-graduation courses of botany are available with mixed mainstream like Biology and Genetics, Biotechnology, and Environmental Science. A candidate is given a complete idea about the entire plant kingdom and plant physiology during this course. Following are the well-known institutions in India that offer post-graduation courses in Botany:

INDIAN INSTITUTE OF SCIENCE (Bengaluru)

The Indian Institute of Science (IISc) is a public, deemed research university for higher education and research in science. It is located in Bengaluru. A joint admission test for M.Sc., commonly called the JAM exam, is conducted every year for admission into Master of Science (M.Sc.) and other post-graduate science programs at the Indian Institute of Science (IISc). IISc was ranked 301–350 in the world by the Times Higher Education World University Rankings in 2021, the top institute in India, as well as 36th in the 2020 Asia University Rankings.

TATA INSTITUTE OF FUNDAMENTAL RESEARCH (Mumbai)

TIFR is a National Centre of the Government of India, under the umbrella of the Department of Atomic Energy and a deemed University awarding degrees for masters and doctoral programs. The TIFR University runs Ph.D. and integrated M.Sc.-Ph.D. programs in all areas of natural sciences that include Physics, Chemistry, and Biology, and Mathematics and Computer Science. TIFR also supports a selective M.Sc. program in various sub-domains of Biology. TIFR GS is a nationwide entrance exam conducted by the Tata Institute of Fundamental Research (TIFR) to provide admission to candidates. Students are admitted to TIFR through a rigorous selection process, which involves a written test followed by an interview. Selection is strictly by merit: only the top 1.5 percent of applicants are selected.

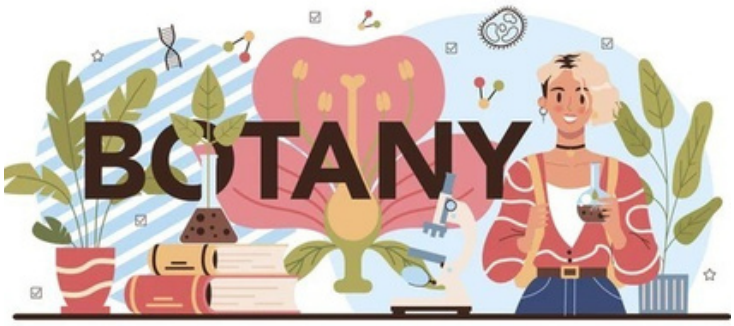
FOREST RESEARCH INSTITUTE (Dehradun)

The Forest Research Institute (FRI) is a Natural Resource Service training institute of the Indian Council of Forestry Research and Education. It is an institution in forestry research in India for Indian Forest Service cadres and all State Forest Service cadres. It is located at Dehradun in Uttarakhand and is among the oldest institutions of its kind. In 1991, it was declared a deemed university by the University Grants Commission. This institution offers post-graduation courses in Forestry, Environment Management, Wood Science, and Technology. These are some of the prime colleges of India for post-graduation in botany which will provide good knowledge to the aspirants and hence help them build a promising career in the field of Botany.

AUTHOR: ROOPA SINGARAVEL NADAR

REFERENCE: university.careers360.com

FUN FACTS!



HEALTHY RECIPE (FENNEL TEA)

1. Fennel is a perennial herb with yellow flowers and a flavor similar to licorice.
2. All parts of the fennel plant have culinary and medicinal uses, including flowers, bulbs, and seeds. However, only the seeds are crushed and steeped to make fennel tea.
3. Fennel tea is a favorite after-dinner drink because it can help promote healthy digestion and keep things moving.
4. Fennel tea may help to calm fussy babies who have a condition called colic, which is characterized by crying that doesn't ever stop.

NATURAL BEAUTY PRODUCTS

1. Buying better quality, organic and natural products actually means you end up saving a lot in the long run!
2. If you use natural and organic skincare products not only will you reap the benefits of beautiful skin, but also can enjoy them guilt-free without harming the environment.
3. Traditional products contain chemicals to artificially freshen the smell of the lotion or cream. Organic products have a natural, pleasant smell and are scented with oils.
4. There is no better test than the test of time, and these natural ingredients have proven their worth and shown not to have any adverse side effects, guaranteeing healthy and beautiful-looking skin.

ROADSIDE NURSERY

1. There are three main categories for plant nurseries, which are: 'Wholesale', 'retail', and 'mail-order'
2. There are three main types of nursery beds: flat, raised, or sunken. These beds can be in an open, under a screen shade, or in a greenhouse.
3. Prior to the development of the gas engine, all nursery stock was harvested and shipped bare-root due to weight considerations.
4. "Pot-in-pot" describes a nursery production system that uses containers (production pots) placed inside permanent in-ground containers (socket pots). Pot-in-pot is used for the production of caliper-sized shade trees, flowering trees, and large shrubs.

INSTITUTIONS FOR FURTHER STUDIES IN THE FIELD OF BOTANY

- **Courses After B. Sc. Botany:**

1. M. Sc. Botany
2. M. Sc. Forestry
3. M. Sc. Horticulture
4. M. Sc. Life Science
5. M. Sc. Bioinformatics

- **Top Recruiters**

1. Department of Agriculture
2. Environmental Protection Agency
3. Forest Service
4. Nature Conservancy
5. Seed company
6. Horticulture Companies
7. Companies Manufacturing medicinal drugs

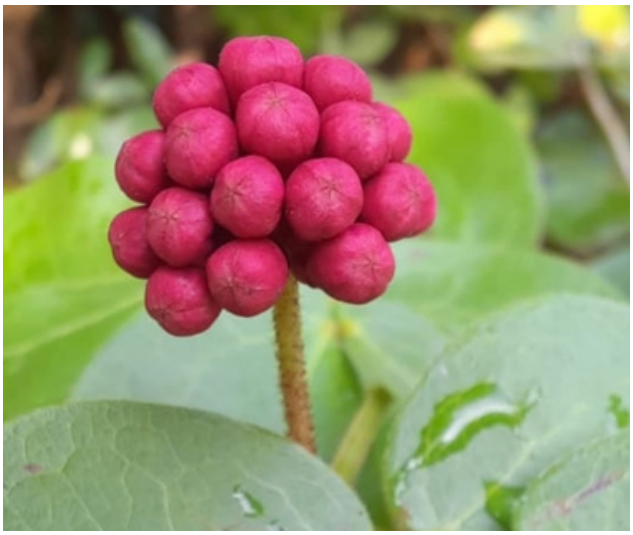
- **M. Sc. Botany Entrance Exams**

1. BHU-PET
2. DU Entrance Test (DUET)
3. TUEE
4. CUCET

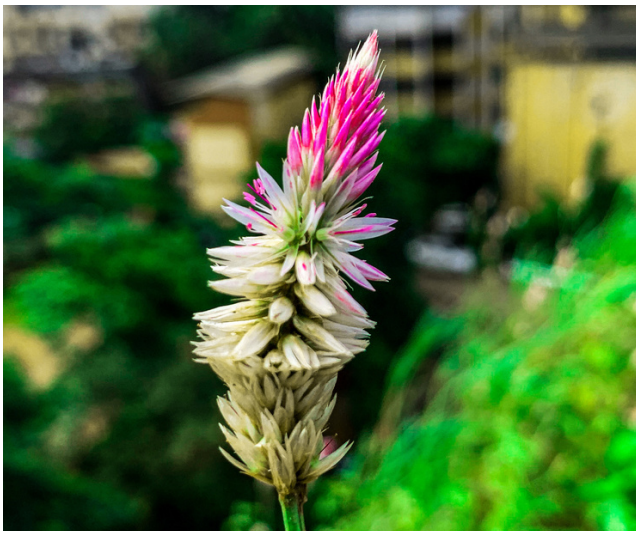
AUTHOR: ANKITA KAMLESH SINGH

REFERENCE: healthline.com, forestrypedia.com & collegedekho.com

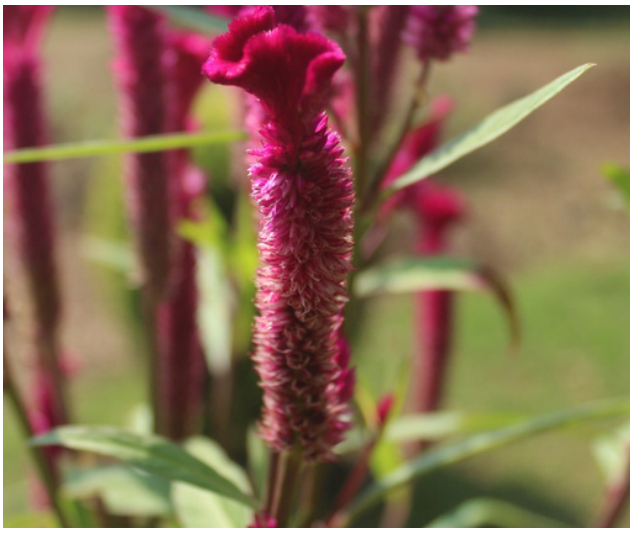
PHOTO GALLERY



Calliandra tergimania
Family: Leguminosae
Ankita Chauhan (S.Y.B.Sc.)
Location: Rock Garden, Nerul



Celosia argentea (wild variety)
Family: Amaranthaceae
Rudra Patra (S.Y.B.Sc.)
Location: Behind KDMC Tekdi, (Kalyan)



Celosia cristata (cultivated garden variety)
Family: Amaranthaceae
Vrushali Anant Rane (T.Y.B.Sc.)
Location: Gujrat-Silvassa, Nakshtra garden

Brassica rapa
Family: Brassicaceae
Nisha Gunde (F.Y.B.Sc.)
Location: Marathanagar, Satara

Bryophyllum sp.
Family: Crassulaceae
Nadar Jeba Reshma (T.Y.B.Sc.)
Location: Maharashtra Nature Park

Brassica oleracea var. capitata L.
Family: Brassicaceae
Raghavi Vasanth Kumar (T.Y.B.Sc.)
Location: Kalina, Santacruz (East)

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