

November 2020



# GARDENIA

THE COVID SPECIAL ISSUE



## BOTANY DEPARTMENT



*National Education Society's*

**RATNAM COLLEGE OF ARTS, SCIENCE AND COMMERCE**

NES COMPLEX, NATIONAL HIGH SCHOOL MARG, BHANDUP - WEST, 400078

# WORDS OF WISDOM

## *from the Head of the Department*

*"The fragrance of flowers spreads only in the direction of wind, but the goodness of a person spreads in all directions." - Chanakya*

I am absolutely delighted to present the Botany Department's newsletter – **Gardenia**. This fabulous start of sharing is possible because of our Founder President Dr. R.Varadarajan. We are always grateful to him for his visionary guidance and support. I also want to acknowledge the encouragement given by our Principal Dr. Mary Vimochana in all our endeavours.

*Gardenia* is a white beautiful flower which is synonymous with grace and gives a beautiful message – "Be graceful. Forgive others freely and be most patient with yourself."

This newsletter is for and by the undergraduate students. It will cover the activities of our department that include various projects carried out by us, virtual study tours and also interesting facts of Botany. This will help develop research mindfulness amongst the students as well as foster scientific attitude and environment consciousness. *Gardenia* will also encourage knowledge sharing amongst students.

The first issue of *Gardenia* is well planned by our Third year B.Sc – Chemistry Botany students under the guidance of Mrs. Mamta Yadav. I wish best of luck to students and staff of our department – Mrs. Shweta Belose and Mrs. Mamta Yadav for this happy and enjoyable learning experience.

Looking forward to your feedback and support as always!

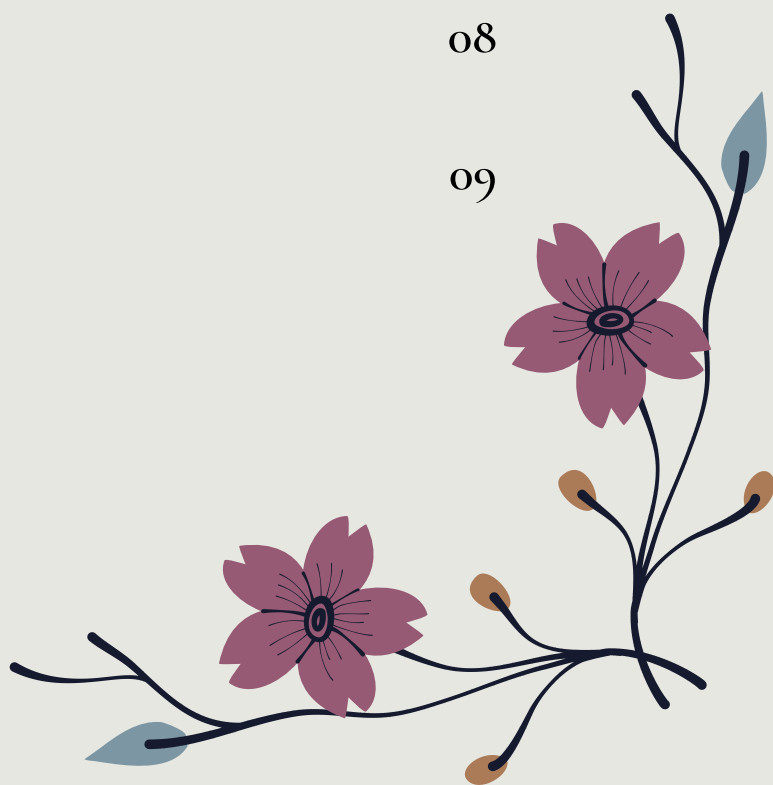


Dr. Sunita Chahar  
Head of the Department

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# AYURVEDIC KADHA



## What is Ayurvedic Kadha?

Kadha or 'Karha' is essentially an Ayurvedic drink prepared with the combination of herbs and spices are boiled usually in water to extract their benefits. Ministry of Ayush recommended to drink this kadha during the pandemic situation of covid-19. Because all those ingredients having immune boosting properties which is really helpful to fight with novel coronavirus.

## INGREDIENTS OF AYURVEDIC KADHA



MULETHI

Mulethi has immunity boosting and anti-inflammatory properties. It is an ancient remedy for sore throat.



TULSI

Basil Leaves or Tulsi has immunity boosting, antipyretic and analgesic properties. It is also packed with other disease fighting antioxidants.



CINNAMON

Cinnamon acts as an expectorant and is naturally sweet in taste. It is highly beneficial for managing sore throat.

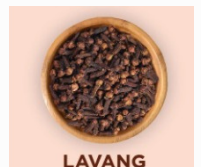


GINGER

Ginger has anti-inflammatory and anti-viral properties that help in removing toxins from the respiratory tract.

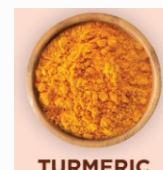


Cardamom relieves discomfort, nausea and vomiting, lowers the blood sugar and prevents anxious behaviour.



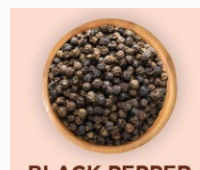
LAVANG

Clove or Laung is packed with anti-inflammatory, anti-microbial properties. It soothes the throat and prevents coughing.



TURMERIC

Turmeric contains bioactive ingredients with medical properties.



BLACK PEPPER

Black pepper helps in detoxification of the body and cleaning of stomach and intestine.



GILOY

Giloy boosts immunity and treats chronic fever.

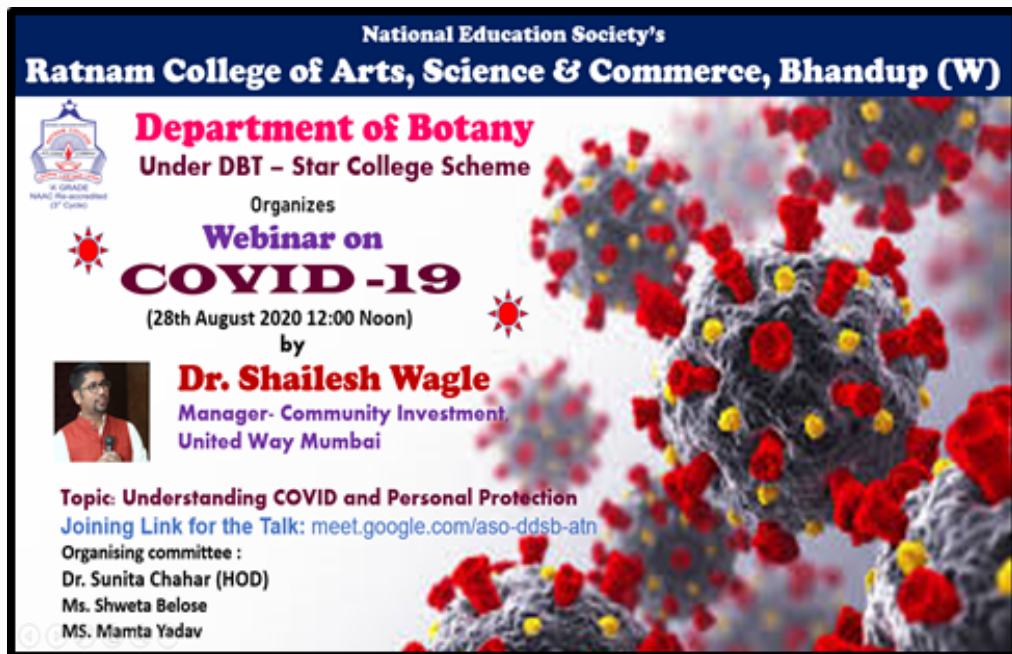
## PREPARATION OF AYURVEDIC KADHA

Take cardamom 2-3, basil leaves 4-5, clove 2-3, black pepper-3, ginger 1 tsp, turmeric 1/2 tsp, mulethi 1/2 tsp, small piece of cinnamon and giloy. Boil all the ingredients to prepare a tea.



# GUEST LECTURE REPORT

## *Covid-19 and Personal Protection*



The poster is for a webinar titled "Webinar on COVID-19" organized by the Department of Botany at Ratnam College of Arts, Science & Commerce, Bhandup (W). It is part of the DBT - Star College Scheme. The webinar is scheduled for 28th August 2020 at 12:00 Noon. The speaker is Dr. Shailesh Wagle, Manager - Community Investment, United Way Mumbai. The topic is "Understanding COVID and Personal Protection". The joining link is [meet.google.com/aso-ddsb-atn](https://meet.google.com/aso-ddsb-atn). The organizing committee includes Dr. Sunita Chahar (HOD), Ms. Shweta Belose, and Ms. Mamta Yadav. The background of the poster features a 3D rendering of a coronavirus particle with red and yellow spikes.



### *Profile of the Guest Speaker*

Dr. Shailesh Wagle completed his graduation in Ayurveda, and has a master's degree in public health from Manipal University. His specialization for a Master's degree was in environmental and occupational health. He also has a Certificate in Global Health from Maastricht University, Netherlands.

Currently he is working with United Way Mumbai for the past 5 years and manages Health-related projects. He has been working on COVID 19 response since March 2020 and has trained more than 250 medical staff at hospitals such as St. George's Hospital, GT Hospital, Rajawadi Hospital, Bhabha hospital at Kurla, and HBT trauma care center.

The Department of Botany organized a talk 'COVID-19 and Personal Protection' on 28th August 2020, Friday.

The aim was to spread awareness among the students regarding ongoing COVID-19 pandemic. The Activity was held under the DBT-Star College scheme.

The objective of the talk was to dispel the myths associated with the novel coronavirus infection and make students aware as to how they can prevent the exposure to the infection.

The guest speaker for the talk was Dr. Shailesh Wagle, Manager-Community Investment, from the NGO, United Way Mumbai. The talk was organized on the online platform Google meet and a total of 83 participants attended it. After the presentation by the speaker an interactive question answer session was held with the participants.

Students were forthcoming with their doubts regarding the means of spread of infections, precautions to be taken while going out and when there are senior citizens and infants in the family, when the vaccine will be available, probable home remedies and whether they are effective.

The alumni of Botany department, Ms. Karishma Lokhandwala, helped in organizing the talk as she is also working in the same NGO.

# VIRTUAL EXCURSION TO SGNP

## Sanjay Gandhi National Park (SGNP)

A virtual excursion was organised by the botany department of our college to Sanjay Gandhi National Park also known as SGNP. It is a 104 sq. km. protected area in Mumbai, Maharashtra State in India. It was established in 1996 with headquarters at Borivali East. The major objective was to familiarize us with the flora and ecology of the region.



### About

The park occupies most of the northern suburbs of Mumbai. To the west lie the suburbs of Goregaon, Malad, Kandivali, Borivali and Dahisar. To the east lie the suburbs of Bhandup and Mulund. To the south lies the Aarey Milk Colony and the university campus of IIT Bombay. The northern reaches of this forest lie in Thane city. The park and these areas surrounding it, except Thane city are all part of Mumbai. It is the only protected forest located within the limits of a city.

### History

The park was named 'Krishnagiri National Park' in the pre-independence era. At that time the area of the park was only 20.26 sq. km (7.82 sq mi). In 1969, the park was expanded to its present size by acquiring various reserve forest properties adjoining the park. After this, an independent unit of the Forest Department called 'Borivali National Park Subdivision' administered the area. Krishnagiri National Park was created in 1974 and later renamed as 'Borivali National Park'. In 1981, it was re-dedicated as 'Sanjay Gandhi National Park' in memory of Sanjay Gandhi, the son of ex-Prime Minister of India Indira Gandhi.

### Biodiversity

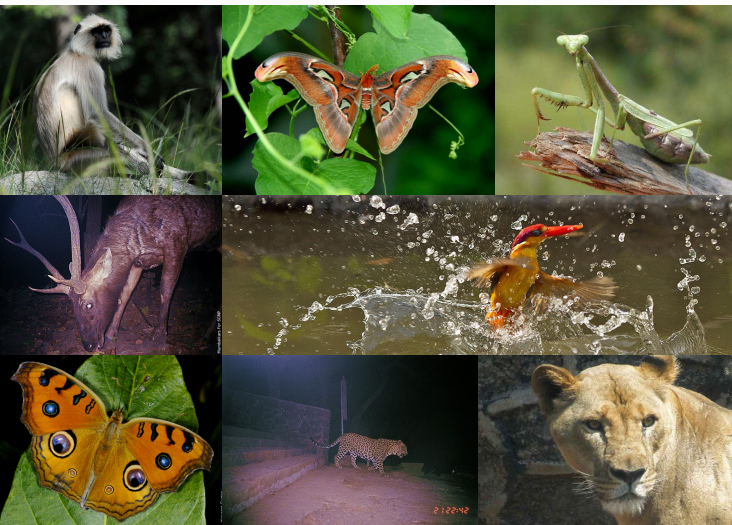
It is a home to more than:

- 254 species of birds
- 40 species of mammals
- 78 species of reptiles and amphibians
- 150 species of butterflies
- over a staggering 1,300 species of plants



## Flora

SGNP's biodiversity is greatly influenced by elements of the Sahyadri Hills to the east, and over the years, the changes brought about by human impact. The most dominating habitat-type here is the Forest habitat. Of flowering plants alone, an estimated 1300 species exist in SGNP. Forest consist of trees like: Tectona, Albizzia, Terminalia, Holarrhena, Firmiana, Dalbergia, Garuga, Grewia, Adina, Ficus, Madhuca, Caraya, Butea, true Asoca (Saraca asoca). Grasses like Bamboo and shrubs like Karvi (Strobilanthes) are also found.



## Other Attractions

- Kanheri Caves,
- Recreational Boating,
- Lion & Tiger Safari,
- Walking Trails,
- Vanrani,
- Buddhist Vihar,
- Mahatma Gandhi Memorial,
- Trekking trails,
- Jain Temple,
- Trimurti Temple,
- Star gazing,
- Butterfly garden.



## Fauna

**Mammals** : Spotted Deer, Sambhar, Barking Deer or Black-naped Hare, Leopard, Porcupine, Palm civet, etc. are found in the park.

**Birds**: The National Park is a bird watchers' paradise. Tickell's Flowerpecker, many species of Sunbirds, Paradise Flycatcher, Trogon, Brown-headed Barbet, Parakeets, Racket-tailed Drongo, Spotted babbler, etc. are also found in this forest.

**Other animals**: Crocodiles, Bamboo-pit Viper, Ceylonese Cat Snake, Crabs, Spiders, Silk cotton bugs, Beetles, several kinds of Mantis, etc. are found in this park. Blue Mormon, Jezebels, Monarchs, Egg fly, Sailors are some of the many attractive butterflies one can find here.



# VIRTUAL EXCURSION TO KAAS PLATEAU



A virtual excursion was organised by the botany department of our college to Kaas Plateau also known as Kaas Pathar. Kaas Plateau (Kaas Pathar) also known as Valley of Flowers. This is India's First Colourful Flowers Plateau. This plateau is famous for its rare wild flowers which blooms in the month of August-September every year. The major objective was to familiarize us with the flora and ecology of the region.

It is a plateau situated 25 km west to Satara city in Maharashtra, India, at an altitude of 1200 m and is approximately 10 sq km in area. It falls under the Sahyadri Hills of the Western Ghats, and it became a part of a UNESCO World Natural Heritage Site in 2012.

## Biodiversity

It is a biodiversity hotspot known for various types of seasonal wildflowers bloom and numerous species of endemic butterflies annually in the months of August and September. Many species are observed on plateau which are new to Botanical Science. Many of the endemic, endangered plants are found on the Plateau.

Kaas and the nearby Koyna area is home to about 1,500 types of plants – 156 botanical families, 680 genera, 1452 species, 400 medicinal plants, and about 33 endangered varieties. More than 450 species of wild flowers bloom in and after monsoon season and most of them are endemic herbs. More than 850 species of flowering plants are reported on the plateau. 624 species have entered in the Red Data Book. Out of these 624 species, 39 are found only in Kaas Region.

## Flora

Flora of Kaas almost includes every shade of colours. The flora includes the white *Habenaria*, bright yellow sonki (*Senecio grahamii*) and micky-mouse shaped *Smithia*, purple *Aponogeton satarensis* (endemic to the Western Ghat region), Seeta's tears or *Utricularia*, shrubs such as the Karvy, and carnivorous plants such as *Drosera indica*. etc.

## Other Attractions:

- Shri Kshetra Yewateshwar,
- Kaas Lake,
- Bamnoli Boat Club,
- Ghatai Devrai,
- Vasota Fort,
- Kumudini Lake,
- Bhambawali Wanrai Water Fall.

## Fauna

Fauna found on Kaas is also having specific features; they are both insectivorous as well nectivores. This reflects high diversity in amphibians. Among 139 species of amphibians different species of frogs are found in an ample quantity. In Reptiles, varieties of snakes are seen here. Small rat to enormous gaur are among the most common and important mammals of Kaas.

## Best time to visit:

The mid of August and early October is considered to be the best weather to visit the Kaas Plateau. At this time, the whole Plateau is covered with carpet of variously coloured flowers.



# Saussurea obvallata

## Classification:

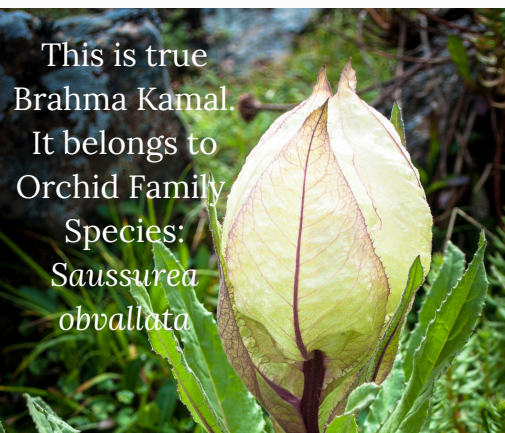
<b>DIVISION</b>	- Angiosperms
<b>CLASS</b>	- Eudicots
<b>SUBCLASS</b>	- Asterids
<b>ORDER</b>	- Asterales
<b>FAMILY</b>	- Asteraceae
<b>SUBFAMILY</b>	- Cynareae
<b>GENUS</b>	- Saussurea
<b>SPECIES</b>	- <i>S. obvallata</i>

## About:

Brahma Kamal is an Indian mythological flower that has many stories around it. Brahma Kamal is the name of a species of flowering plant found mostly in the Himalayas. They are also found in many places in and around India. "This is the original species and is mentioned as Brahma Kamal in Puranas." All other species are misnomers.

These flowers start blooming after sunset, which is from 7 PM. It takes around 2 hours to bloom completely up to 8 inches in diameter and remain open the whole night. It blooms only one night throughout the year. As it blooms, it releases a beautiful fragrance in the atmosphere. These flowers bloom in mid-monsoon that is between July and August on the hillside at an altitude of around 4000m. These flowers can be seen till mid-October after which the plant will perish, and it will be visible again in April.

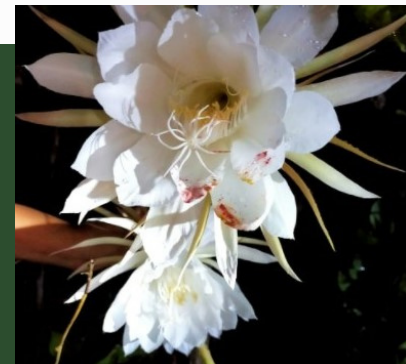
It is commonly known as "Queen of the night", "Lady of the night", and "Night Blooming Cereus" because of its blooming nature during the night.



This is true Brahma Kamal. It belongs to Orchid Family. Species: *Saussurea obvallata*

## Brahma Kamal is considered as a sacred plant in India:

It is believed that the wishes of people who pray to God while the flower is blooming will be fulfilled. It is known as "Brahma Kamal" in Maharashtra. Brahma Kamal is named after Brahma the creator of Universe and so it is also called as "King of Himalayan Flowers". We came to know Brahma Kamal as a holy flower from our Puranas. Brahma Kamal is the state flower of "Devbhumi", which is also called as "Land of Gods", that is Uttarakhand, India. Brahma Kamal flowers are offered in the hill temples of Uttarakhand, like Kedarnath, Badrinath and Tungnath.



This is also known as Brahma Kamal but it belongs to Cactus Family. Also known as Misnomer.

Species: *Epiphyllum oxypetalum*

## Botanical Features:

Brahma Kamal has a stout stem with 15cms to 45cms long. The flower head is covered with yellow bracts which are boat-shaped. Flowers look beautiful but their smell is not very comfortable and this might be one of the reasons for people for not bringing this plant home.

## Uses in Traditional Medicine:

The entire plant of Brahma Kamal is used as a remedy for human diseases and it is not clinically proven though. It is helpful to treat fevers. The flowers, leaves are used for the treatment of cough, cold, bone ache and intestinal ailments. The rhizomes are used as antiseptic and for healing. The plant is used in the paralysis treatment which is known to be the Tibetan system of medicine.

# EXTRACTION OF PHYCOCYANIN

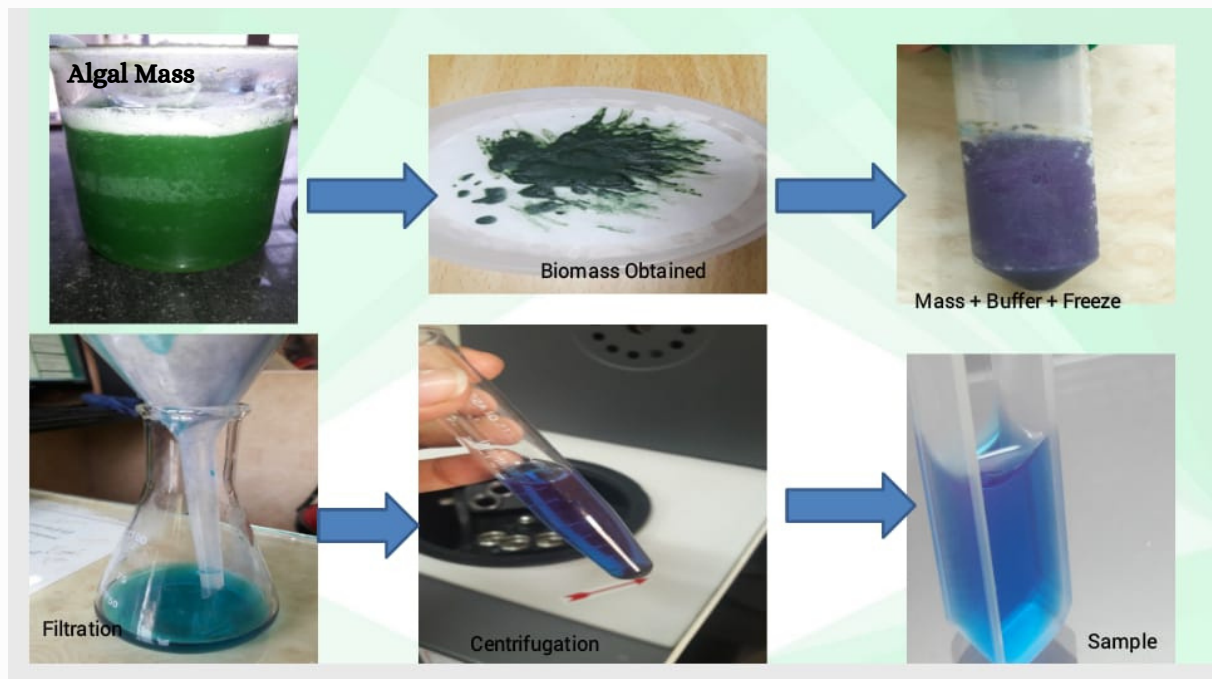
## Introduction:

Phycocyanin is a water soluble blue pigment that gives blue-green algae a bluish tint. It is powerful water soluble antioxidants. *Spirulina platensis* excellent source of phycocyanin. Phycocyanin is located in photosynthetic lamella in cytoplasmic membrane of *Spirulina*.

Phycocyanin isolated from marine organisms has the characteristics of high efficiency and low toxicity, and it can be used as a functional food. It has been reported that phycocyanin has anti-oxidative function, anti-inflammatory activity, anti-cancer function, immune enhancement function, liver and kidney protection pharmacological effects. Thus, phycocyanin has the potential to be utilized as medicine after through research.

We extracted Phycocyanin from *Spirulina platensis* in our laboratory as a part of our project work.

## Procedure for Phycocyanin Extraction:



## Method used for Phycocyanin Extraction:

CONTINUOUS FREEZING AND CENTRIFUGATION TECHNIQUE.

## Uses of Phycocyanin:

It shows a wide range of pharmacological effects, with anti-oxidation, anti-cancer, anti-inflammatory activity, photo-induced cytotoxicity and stimulating the immune system.

- Plays an antioxidant role in inhibiting hepatic lipid peroxidation and being helpful for liver protection.
- Scavenges free radicals from damaged nerve cells, which could avoid DNA oxidative damage cause from free radicals and prevent neuronal cell apoptosis.
- Plays an effective anti-cancer role in various cancer cell types (such as breast cancer, liver cancer, lung cancer, colon cancer, Leukemia, bone marrow cancer and so on) in vitro and in vivo.

# KITCHEN GARDENING



Kitchen garden is a small area of ground or part of a garden where one cultivates vegetables, herbs and fruits for their own use.

It is great and manifold. A kitchen garden ensures an inexpensive, regular and handy supply of fresh vegetables which are basic to nutrition. The green vegetables contain vitamins and minerals which protect us against diseases. It also helps us to solve our food problem.

Gardening helps to purify air, reduce stress, increase mental and physical strength, build self-esteem, boost Vitamin-D. Nothing can beat the taste of freshly grown vegetables in your kitchen garden. And imagine the pleasure it's going to provide to your eyes and soul.

## Tools:

You don't need to have a huge collection of tools. But having the right garden tools can help you take care of your kitchen garden. Some of the most important garden tools: Gloves, Hand trowel, Hand fork, Shovel, Digging fork, Rake Spades, Secateurs, Long-handled pruners, etc.



## Maintenance:

Add a 2- to 4-inch layer of organic mulch around your vegetable plants to suppress weeds, maintain soil moisture, reduce watering, water supply to garden, moderate soil temperature, improve soil health, and keep vegetables cleaner and correct fertilizers.

	Tomato	Coriander	Chilli
<b>Plant Type</b>	Summer annual	Winter annual	Annual or Perennial
<b>Sowing Time</b>	August to September	Late October to Early November	Late January to Early March
<b>Harvest Time</b>	February to July	April	Late May to Early June
<b>Germination Time</b>	Two and half weeks	3 weeks	One to Two weeks
<b>Irrigation</b>	Water daily till roots arise, then once in a week.	Subsequent irrigation in 10 to 12 days of interval.	Water moderately, whenever the top one inch soil feels dry.
<b>Sunlight</b>	8 hours of sunlight a day at temperatures between 65 to 85 degrees Fahrenheit.	4 to 5 hours of sunlight a day at temperatures between 68 to 70 degrees Fahrenheit.	6 to 8 hours of sunlight a day at temperatures between 71 to 77 degrees Fahrenheit.
<b>Soil pH</b>	6.5 to 6.7	8.0 to 10.0	4.5 to 6.5
<b>Space</b>	Requires limited space.	Requires limited space.	Requires limited space.
<b>Can be grown in</b>	Hanging baskets, planter pots, window boxes, containers (20 inches), etc.	Pots or Trays (25cm deep and 18 inches wide)	Pot, Bags or Container (12 inch deep).
<b>Propagation</b>	Seeds or Saplings	Seeds	Seeds or Saplings
<b>Note</b>	Please make sure that you're always wearing gloves while handling chilli and it's seeds. Avoid touching your eyes, face and any sensitive skin, and always wash your hands afterwards.		

## Plants Used:

We can grow herbs, plants and green leafy vegetables like Coriander, Mint, Tomatoes, Brinjal, Capsicum, Chilli, Onion, Garlic, Ginger, Celery, Beans, Spinach, Fenugreek, Broad Leaf Mustard, Lemon Grass, etc. Apart from these we can grow several roots and tubers like Potato, Whitespot Giant Arum, Garadu (Arui), Radish etc.

**“Grow your own plants. Eat fresh fruits or vegetables and stay healthy and save your money as well as nature.”**

# STUDENTS' SPEAK

## TYBSc (Chemistry - Botany) Students' view on COVID - 19

### **Bhoomi:**

- **Positive impact-** Due to the pandemic everyone could come in contact with family members spending quality time and strengthening family bonds.
- **Negative impact -** Rate of death increased due to various illnesses.

### **Shruti:**

- **Positive impact-** Medical students are trained to work under such adverse and emergency situations.
- **Negative impact -** Sudden changes in teaching methods has become hectic.

### **Hemansi:**

- **Positive impact-** People got a chance to practise their hobbies and have a good time. "I practised Painting after 7 years due to leisure time."
- **Negative impact -** All career and future plans spoiled.

### **Kanchan:**

- **Positive impact-** Upcoming discoveries and innovation in all affected sectors or spheres at national, regional and global levels.
- **Negative impact -** Increased risk of poverty.

### **Aarti:**

- **Positive impact-** Covid helped nature to heal all over.
- **Negative impact -** Pandemic affected farmers adversely.

### **Disha:**

- **Positive impact-** Some infectious diseases are fading from hospital emergency departments.
- **Negative impact -** Haphazard use and disposal of disinfectant mask and gloves and burden of untreated wastes continuously endangering the environment.

### **Kalpna:**

- **Positive impact-** People learned to face adverse conditions.
- **Negative impact -** Increased suicide rates.

### **Pawan:**

- **Positive impact-** Localisation created jobs.
- **Negative impact -** Though there has been a positive impact on the environment due to the lockdown, there is fear that once people start travelling again or go back to doing what they have been doing, all the positive impact will also disappear.

### **Chandrakesh:**

- **Positive impact-** NGOs started working actively.
- **Negative impact** - Covid can create long term health issues.

### **Rohit:**

- **Positive impact-** Education becomes digitized and affordable.
- **Negative impact** - Stray animals are not being feeded upon by people in this pandemic.

### **Trupti:**

- **Positive impact-** Decreased road accidents, traffic and noise pollution.
- **Negative impact** - Increase of medical waste.

### **Reena:**

- **Positive impact-** Archaeologists had a chance to dig upon and found a 1000s of years old fossilised cave.
- **Negative impact** - People couldn't buy branded things.

### **Pooja:**

- **Positive impact-** The pollution graph started decreasing.
- **Negative impact** - People could not find parts of electronic gadgets as import from other countries was banned.

### **Preeti:**

- **Positive impact-** Self development due to lifestyle changes.
- **Negative impact** - Vaccines have not been launched even after seven months of pandemic.

### **Pranali:**

- **Positive impact-** People came to know the importance of nature in this lockdown.
- **Negative impact** - Some patients could not reach hospital in time as means of transport was not available due to the pandemic.

### **Kavita:**

- **Positive impact-** Improvisation in medicines.situations.
- **Negative impact** - This might have an overall positive impact on career choice by strengthening students' belief and choice to become good doctors. But may decrease the choice regret and drop rates of the next generation of doctors.

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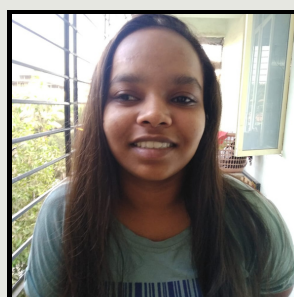
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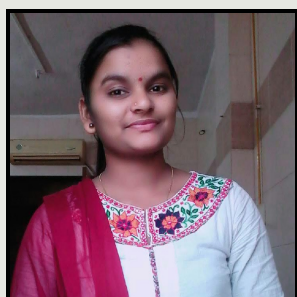
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**KALPANA SHIGVAN**  
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Students' Speak

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