

**e-NEWS LETTER**

**Volume I, Issue II, May 2014.**

**Gujarat University Botanicals Society (GUBS)**

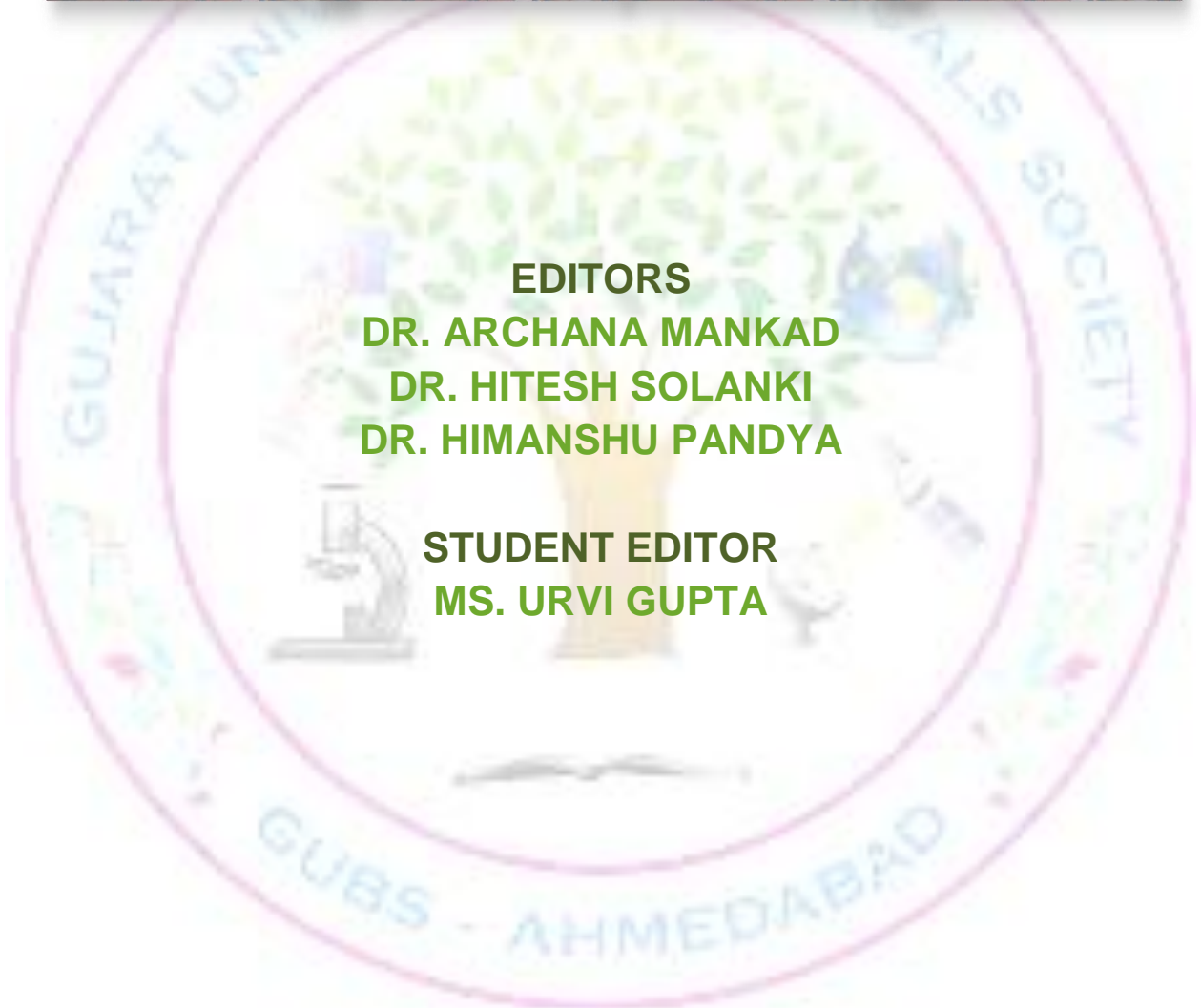


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# ANKUR

Volume I Issue II May 2014



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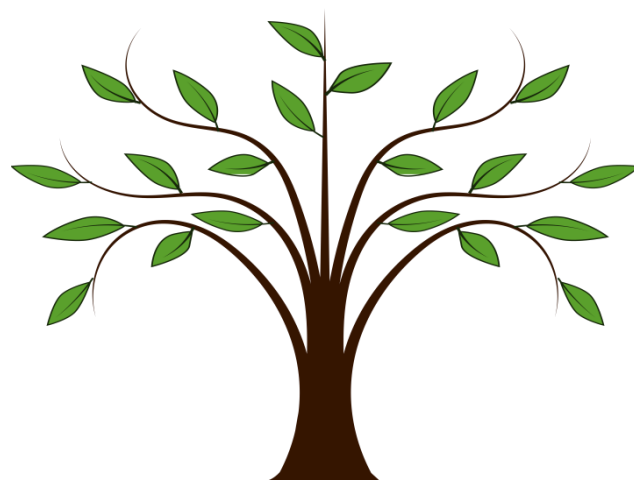
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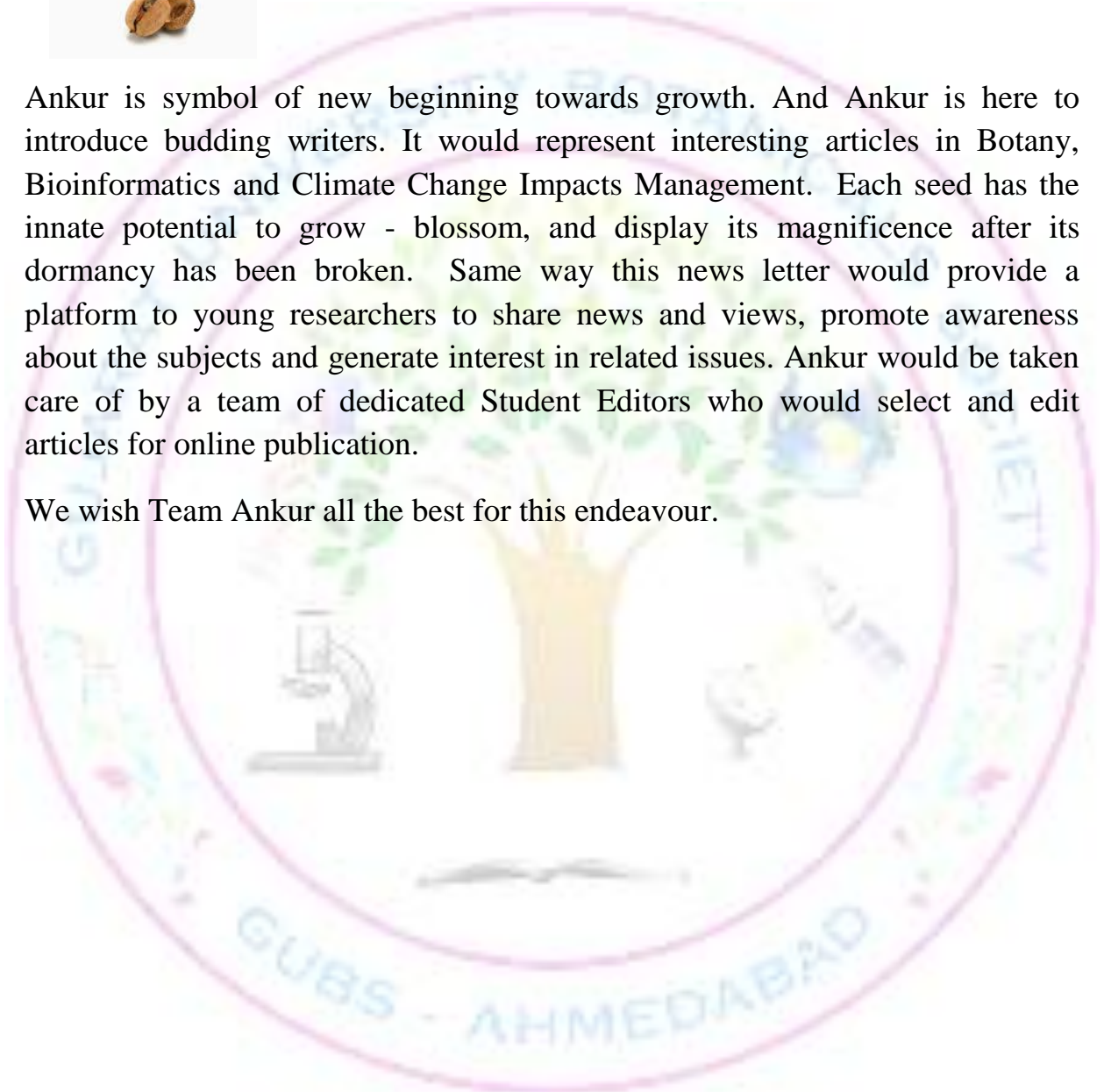


## ANKUR

.....Sprouting of thoughts

Ankur is symbol of new beginning towards growth. And Ankur is here to introduce budding writers. It would represent interesting articles in Botany, Bioinformatics and Climate Change Impacts Management. Each seed has the innate potential to grow - blossom, and display its magnificence after its dormancy has been broken. Same way this news letter would provide a platform to young researchers to share news and views, promote awareness about the subjects and generate interest in related issues. Ankur would be taken care of by a team of dedicated Student Editors who would select and edit articles for online publication.

We wish Team Ankur all the best for this endeavour.





## ***FROM EDITOR'S DESK....***

Ankur is now two issues old. It has begun to establish and grow. The concentrated and consistent efforts of all involved with Ankur have been really praiseworthy. The growth and development of Ankur is a reflection of the growth and progress of the students of the department. This is a platform for positive academic deliberations and we are happy that we have been getting appropriate inputs by our members. The enthusiasm of the PG students to write an article or draw a scientoon is palpable and praiseworthy. We extend our heartiest gratitude to TEAM ANKUR and all involved in the process of completing this task.

The journey has just begun and we have miles to go.. It would not be long when Ankur will establish and its seeds would carry the message of harmony and compassion in years to come.

### **Editorial Team**

Dr.Archana Mankad

Dr.Hitesh Solanki

Dr.Himanshu Pandya

Ms.Urvi Gupta

## DEVELOPMENT FOR PROGRESS

Dr. Archana Mankad

A plant develops using its intrinsic abilities and capacities supplemented with suitable environmental interactions. The dictionary says Development is change while Progress is the process and is used to suggest summation of various aspects thus conveying a wholistic perspective of plant development...So while we say that a plant develops, the progress in plant symbolizes progress in specific aspect of plant development like progress in plant physiology. It can be said that as a *plant develops, the subject progresses. In fact development is the reason for progress.*



Likewise a **Person** develops owing to the fundamental values and potentialities and **progresses** with suitable training and value addition. Anyone with a positive attitude and reasonable courage can excel, just like a small seed has the ability to grow into a giant tree, any person can make it big. The Only thing that is stopping all of us is the courage to identify our strengths and accept our weakness. Once this herculean task is accomplished all we need to do is work towards converting our weaknesses into strengths. So let us begin TODAY and advance slowly even if it is inch by inch towards our goals...so that we progress.

**As personality develops person progresses**





## MILLETS.... THE NUTRIA-CEREALS!!!!

Dr. Hitesh A. Solanki

Millets are small-seeded grasses that are strong and develop well in dry zones under marginal conditions of soil fertility and soil moisture. Millets are also unique due to their short growing season. They can develop from planted seeds to mature, ready to harvest plants in as little as 65 days. This is important in heavily populated areas. Millets can be stored for more than two years if properly stored. They are one of the oldest foods known to humans & possibly the first cereal grain to be used for domestic purposes.

### Types of Millets

The millets include species in several genera. They are majorly classified in two categories.

#### Major Millets

1. Pearl millet (*Pennisetum glaucum*)
2. Foxtail millet (*Setaria italica*)
3. Proso millet also known as common millet, broom corn millet, hog millet or white millet (*Panicum miliaceum*)
4. Finger millet (*Eleusine coracana*)



#### Minor millets

1. Barnyard millet (*Echinochloa* spp.)
2. Kodo millet (*Paspalum scrobiculatum*)
3. Little millet (*Panicum sumatrense*)
4. Guinea millet (*Brachiaria deflexa* = *Urochloa deflexa*)

5. Browntop millet (*Urochloa ramosa* = *Brachiaria ramosa* = *Panicum ramosum*)



### Nature's Nutraceuticals

Millets are highly nutritious, non-glutinous and not acid forming foods. Hence they are comforting and easy to digest. They are considered to be the least allergenic and most digestible grains available. Compared to Paddy rice, especially polished Paddy rice, millets release lesser percentage of glucose and over a longer period of time. This lowers the risk of diabetes. Millets are particularly high in minerals like iron, magnesium, phosphorous and potassium.

India is the leading producer of much kind of millets, which are often referred as coarse cereals. However, realizing the nutrient richness of these grains they are now considered as "nutria-cereals". Small millets, as a group includes several grain crops namely finger millet (ragi), proso millet, barnyard millet, italian millet, kodo millet, little millet, job's tears and, teff. Though they occupy relatively a lower position among feed crops in Indian agriculture, they are quite important from the point of food at regional and farm level. Small millets have a capacity for wide adaptation. Their long storability under ordinary conditions has made them "famine reserves".

They can withstand a certain degree of soil acidity and alkalinity, stress due to moisture and temperature and variation in soils from heavy to sandy infertile. They are grown from the extreme southern tip of India at sea level to the temperate north Himalayan areas up to an altitude of 3000 metres with consequent variation in photoperiod from short to long days. That is why, it is important enhance production and productivity of these crops to ensure food and nutritional security.



Millets have been included in various Indian dishes since long and have been prepared differently in different regions. But these traditional recipes are vanishing day by day.

### Most common Cooking styles of small millets in India

Crop	Food Items
Finger millet	Roti, Thin Porridge, Mudde, Dosa (fermented pan cake, Noodles, Popped grain flour, Pappad, halwa, Malted beverage, Fermented beverage
Foxtail millet	Cooked rice, Kheer, Mudde, Roti, Thin Porridge, Dosa, ,Sattu, Halwa
Proso millet Halwa	Cooked rice, Kheer, Roti, Thin Porridge, Sattu,
Indian Barnyard millet	Cooked rice, Kheer, Roti, Thin Porridge, Halwa
Kodo millet	Cooked rice, thin Porridge
Little millet	Cooked rice, Kheer, Thin Porridge, Dosa, ,Sattu , Halwa

### Conclusion:

The use of millets is declining day by day in today's regular diet. If the food items with value addition can be reintroduced in diet, malnutrition can be reduced up to certain levels as millets are cheaper and very nutritious.

## WONDERFUL PLANTS: CLIMBERS

Ruby G. Patel

Climbers are plants that always grow with the help of proper support. All the same, they can grow as herb or cover the ground when support is not available. Climbing plants differ from self supporting plants, such as shrubs and trees, in a range of characteristics; most notable is the mechanical properties of the stem. A climbing habit has evolved independently in several plant families where different climbing methods can be seen. Some plants like *Ipomoea* climb by twining their stems around a support and are called as Twiners. Others like *Hedera* climb by way of adventitious and/or clinging roots and are referred to as Root climbers. Many use tendrils which may be specialized shoots as in Vitaceae, or leaves as in Bignoniaceae, or even inflorescences like in *Passiflora* and are called as Tendril climbers. Others climb through the use of thorns, which pierce the support (Climbing rose); or by other hooked structures, such as hooked branches (*Artabotrys hexapetalus* L) and are referred to as Hook climbers.

Classical treatment of climbers by early morphologists like Dutta includes them under weak-stemmed plants. Weak-stemmed plants without rooting at intervals are commonly known as trailing plants (*Abrus precatorius* L); a trailing stem lying prostrate on the ground is said to be prostrate or procumbent (*Basella rubra* L). When a stem trailing on the ground for some distance tends to rise at its apex is called decumbent (*Leucus biflora* R Br). A weak stemmed plant spreading on the ground and rooting at the nodes is said to be creeping (*Epipremnum pinnatum* L). A creeping stem may be a runner (*Cynodon dactylon* L Pers), with thin internodes, a stolon with stout internodes or a sucker (*Ipomoea batatas* L (Lam), *Dioscorea*), an offshoot from any underground stem. According to its varied nature, weak stems attach themselves to any neighboring object by means of some special devices.

Twiners, such as garden peas, climbing jasmines, and morning glories, are perhaps the most studied of all vines. The growing tips waves around in a circular motion known as circumnutating until it finds an appropriate upright support and then starts wrapping around it to extend upwards. The Climbers are an integral part of any outdoor landscape and are exploited for their colourful and/ or fragrant flowers and unique foliage. Generally they are fast growers and

are easy to maintain thus, making them a good choice by the landscape designers.

**SCIENTOON** **MASS SPECTROMETRY**

**Mass Spectrometry** technique is like breaking a cup in the dark and then reassembling it in the light, piece by piece to find out that:  
*Oh! So it was a CUP."*

Oh Yes! Its Monika who broke my heart. But how did you know this?

"It's not mass spectrometry but just your face reading, my friend!"

Pradeep

Sciencetoons  
by  
Dr. Pradeep  
Srivastava

**SCIENTOON** **2 Billion people belonging to 60 countries of the world are dying for water. By the year 2050 the figure may go up to 7 billion.**

PradeepK.Srivastava

"For the last three generations, our family was very scientific in managing the water problem but what can I do when there is no water left?"



## PLANT NANOBIONICS- AN EMERGING FIELD OF PLANT SCIENCES....

Shirin Qureshi

Plants have been of immense importance since time immemorial. Plants are not only the basis of the food-chain but also valuable sources of fuel, oxygen and in providing the cool environment. Recently, at Massachusetts Institute of Technology, researchers have come up with a new field of science – “*Plant Nanobionics*”. Researchers are trying to augment plants with nanomaterials which would help monitor environmental pollutants as well as enhance their energy production. The paper in *Nature Materials* stated that embedding carbon nanotubes in the chloroplast boosted the plants ability to capture light by 30 percent.

According to Michael Strano, “Plants are very attractive as a technology platform. They repair themselves, they’re environmentally stable outside and they survive in harsh environments and they provide their own power source and water distribution.”

The idea came up in the Strano’s lab to build self-repairing solar cells modeled on plant cells. They wanted to try enhancing the photosynthetic function of chloroplasts isolated from plants for possible use in solar cells. Chloroplasts are an important organelle of the plant. They have all the materials needed for photosynthesis. It occurs in two stages. During the first stage, chlorophyll absorb light, which excites electrons that flow through the thylakoid membranes of the chloroplast. The plant captures this energy and uses it to produce sugars.

Chloroplasts could perform these reactions when removed from the plants, but after a few hours they began to break down because the proteins were degraded due to the light and oxygen damage. Plants can repair this damage but extracted chloroplasts couldn’t do it on their own. To increase their productivity the researchers embedded them with cerium oxide nanoparticles (nanoceria). These particles are strong antioxidants that protect the chloroplast from damage. They delivered nanoceria into the chloroplasts using a new technique called Lipid exchange envelope penetration or LEEP. The particles wrapped in Polyacrylic acid, a highly charged molecule, allow the particles to penetrate the fatty, hydrophobic membranes that surround chloroplasts. In these chloroplasts, levels of damaging molecules dropped dramatically. The same technique was used to

embed carbon nanotubes coated in negatively charged DNA into chloroplasts. Plants typically make use of only about 10 percent of the sunlight available to them, but carbon nanotubes could act as artificial antennae that allow the chloroplasts to capture wavelengths of light not in their normal range, such as ultraviolet, green and near-infrared.

Carbon Nanotubes acted as “Prosthetic Photoabsorber”. The photosynthetic activity measured by the rate of electron flow through the thylakoid membranes- was 49 percent greater than in the chloroplasts without embedded nanotubes. When nanoceria and carbon nanotubes were delivered together, the chloroplasts remained active for few more hours. The researchers then turned to living plants, they applied a solution of nanoparticles to the underside of the leaf, where it penetrated stomata.

In these plants, the nanotubes moved into the chloroplast and boosted photosynthetic electron flow by about 30 percent. They also showed that they could turn plants into chemical sensors by delivering carbon nanotubes that detect the gas nitric oxide, a pollutant.

By adapting the sensors to other targets, they hope to make the plants that could monitor pesticides or fungal infections. They are also working on using electronic nanomaterials, such as graphene into plants. Strano and Juan Giraldo envision turning plants into self-powered photonic devices such as detectors for explosives and chemical weapons. The researchers are also working on incorporating electronic devices into plant



**Plant Nanobionics: Bionic/Cyber Plants could replace street lights**

## DIVERSITY OF PALMS IN GUJARAT UNIVERSITY CAMPUS

Umerfaruq M. Qureshimatva

Palms (Coconut family) are among the best known and most extensively introduced and cultivated plant families for foods, palm products, oils, fruits, timber beside these also in widely used in landscaping for their exotic appearance in both indoor and outdoor decoration. The beatification and elegance of palms were so impressed to the Father of Taxonomy Carl Linnaeus, who told them “**Princess of Plants**” in the Species Plantarum. In the world there are about 2400 species (Mabberley, 2008) belonging to 183 genera (Drensfeld *et al.*, 2008). Most of them restricted to various climates like tropical, subtropical and warm temperate. India is represented by 20 genera and about 96 species among which 24 species belonging to nine genera are endemic to India (Kulkarni and Mulani, 2004). In Ahmedabad 78 species and 37 genera of palms have been reported during the year 2013.

**Table 1 List of Palms in Gujarat University campus**

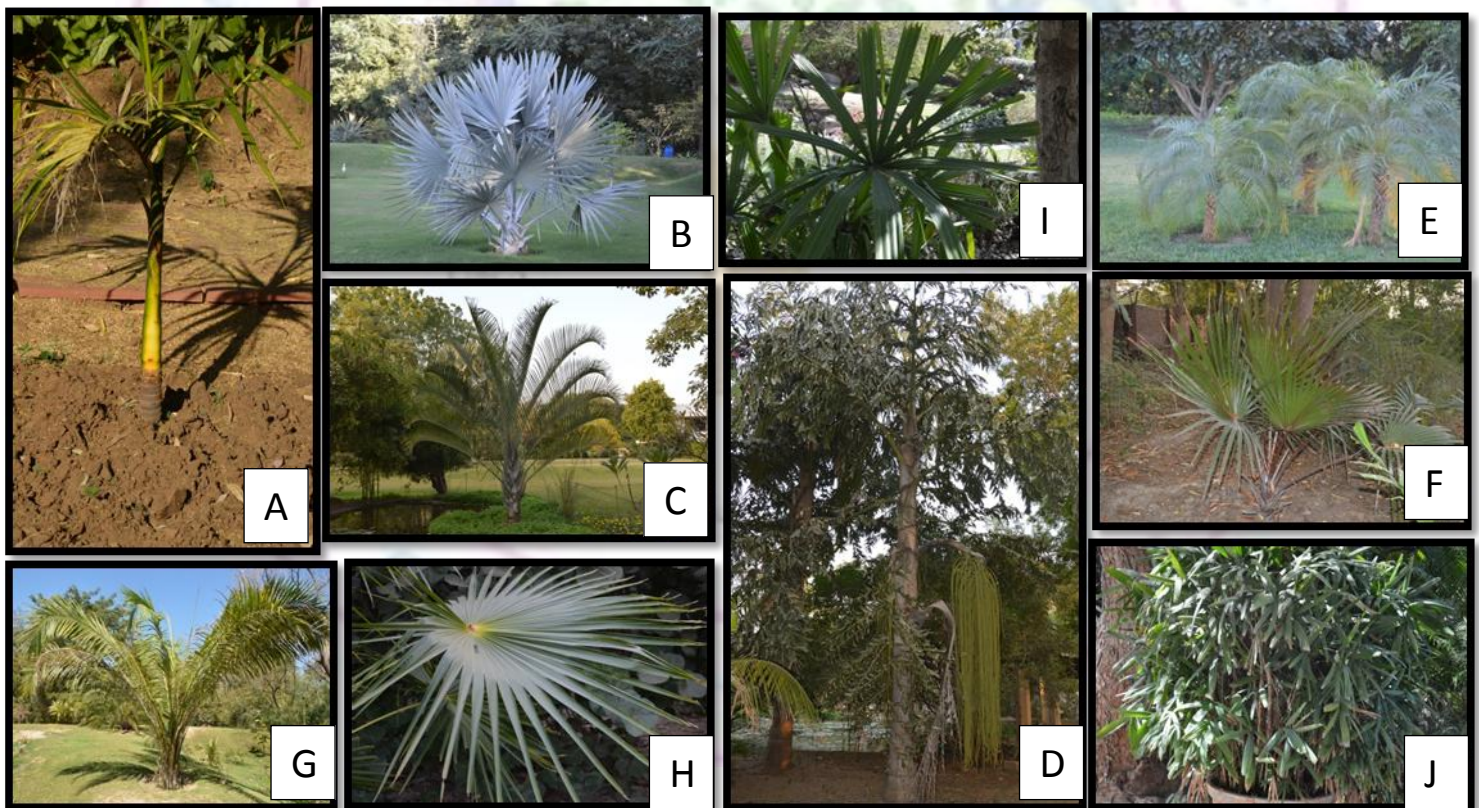
Sr. No	Botanical Name	Common Name	Native Country	Place in GU Campus
1	<i>Areca catechu</i> L cv <i>alba</i>	Areca Palm, Betel Nut Palm	Tropical Asia	Botanical Garden, Dept. of Botany.
2	<i>Bismarkia nobulis</i> Hildebrandt & H Wendl	Bismakia Palm, Greenish	Madagascar	Opp. Clinical research centre and Botanical Garden, Dept. of Botany.
3	<i>Bismarkia nobulis</i> Hildebrandt & H Wendl	Bismakia Palm, Bluish form	Madagascar	Botanical Garden Dept. of Botany and opp. Dept. of Climate Change.
4	<i>Caryota urens</i> L	Toddy Palm, Fishtail Palm	India, Myanmar, Sri Lanka	Botanical Garden, Dept. of Botany.
5	<i>Chamaedorea seifrizii</i> Burret	Reed Palm	Mexico and Central America	Botanical Garden, Dept. of Botany.
6	<i>Cocos nucifera</i> L	Coconut Palm	Tropical Eastern Regions	Botanical Garden, Dept. of Botany and Boys Hostel.
7	<i>Corypha umbraculifera</i> L	Talipot Palm	India, Sri Lanka	Behind Tower.
8	<i>Dypsis decaryi</i> (Hodel) Beentje & J Dransf	Triangular Palm	Madagascar	Near Dept. of Climate Change and Botanical Garden, Dept. of Botany.
9	<i>Dypsis lutescens</i>	Bamboo Palm or	Madagascar	Dept. of Climate Change



	(HWendle) Beentje & J Dransf	Cane Palm		and Botanical Garden, Dept. of Botany.
10	<i>Dypsis lutescens</i> (HWendle) Beentje & J Dransf var cv <i>variegata</i>	Bamboo Palm or Cane Palm	Madagascar	Botanical Garden, Dept. of Botany.
11	<i>Dypsis madagascariensis</i> Hor	Lucuba Palm	The forest of Lucuba	Behind post office
12	<i>Drymophloeus hentyi</i> (Essig) Zona	Unknown	The island of New Britain	Botanical Garden, Dept. of Botany.
13	<i>Elaeis guineensis</i> Jacq	Oil Palm	Tropical West Africa	Botanical Garden, Dept. of Botany.
14	<i>Hyphoene indica</i> Beccari	Doum Palm	India	Botanical Garden, Dept. of Botany.
15	<i>Latania loddigesii</i> Mart	Blue Latan Palm	Mauritius to Mascarene Island	Opp. Dept. of Clinical Research and Clinical Research Centre.
16	<i>Latania lontaroides</i> (Gaertn) H E	Red Latan Palm	Mascarene Island	Botanical Garden, Dept. of Botany.
17	<i>Licuala grandis</i> H Wendl	Raffled Palm	New Hebrides	Botanical Garden, Dept. of Botany.
18	<i>Licuala paludosa</i> Griff	Golden Licuala	Southern Pakistan	Botanical Garden, Dept. of Botany.
19	<i>Licuala peltata</i> Roxb ex Buch-Ham	Unknown	Thailand and Malaysia	Botanical Garden, Dept. of Botany.
20	<i>Livistona chinensis</i> RBr	Chinise Fan Palm	China	Near Tower and opp. Clinical Research Centre.
21	<i>Livistona rotundifolia</i> (Lam) Mart	Footstool Palm	Java, Philippines, Celebes	Botanical Garden, Dept. of Botany; behind post office and opp. Clinical Research Centre..
22	<i>Phoenix acaulis</i> Buch-Ham ex Roxb	Stemless Date Palm	India	Boys Hostel.
23	<i>Phoenix dactylifera</i> L	Date Palm, Khajura	Arabia	Near entrance and Boys Hostel.
24	<i>Phoenix roebelenii</i> O'Brien	Dwarf Date Palm	Southeast Asia	Behind Tower.
25	<i>Phoenix sylvestris</i> Roxb	Wild Date Palm	India	Botanical Garden, Dept. of Botany.
26	<i>Prithcherdia pacifera</i> L	Fiji Fan Palm	Fiji	Botanical Garden, Dept. of Botany and behind tower.
27	<i>Ptychosperma caryotoides</i> Ridley	Unknown	New Guinea	Behind post office.
28	<i>Rhapis excelsa</i> (Thunb)	Lady Palm	China and	Botanical Garden, Dept.

	A Henry ex Rehder		Japan	of Botany.
29	<i>Roystenia olacea</i> Mart	Caribbean Royal Palm	West Indies	Boys hostel.
30	<i>Roystenia regia</i> (Kunth) O F Cook	Cuban Royal Palm'	Cuba	Common in Campus.
31	<i>Thrinax parviflora</i> Sw	Mountain thatch palm	Jamaica	Botanical Garden, Dept. of Botany.
32	<i>Wodyetia bifurcata</i> A K Irvine	Foxtail Palm	Australia	Botanical Garden, Dept. of Botany.

In Gujarat University Campus a total number of 33 species belonging to 22 genera reported in 2013. Gujarat University has a good number of gardens in the campus, all the gardens occupied palms because palms are the key aliment for any kind of garden because of the popularity of this single seeded angiosperm is so much today that new verity, a myriad of colours, patterns and flowering shapes of palms at large scale. There is a special Palmetum in the Department of Botany, where 22 species of palms are planted.



A. *Areca catechu* var *alba*; B. *Bismarkia nobulis*; C. *Dypsis decaryi*; D. *Caryota urens*; E. *Phoenix roebelenii*; F. *Latania lontaroides*; G. *Elaeis guineensis*; H. *Thrinax parviflora*; I. *Licuala paludosa*; J. *Rhapsis excelsa*.



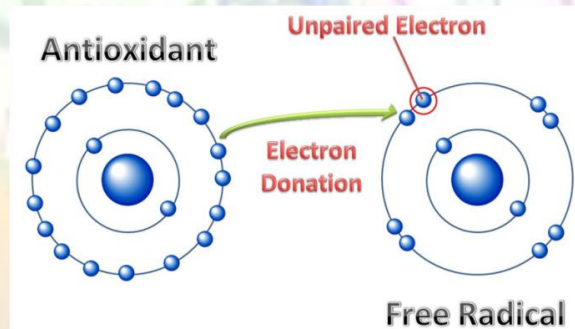
## ANTIOXIDANTS?????? ..... A BOON TO HUMANS!!!!!!!!!!

Ancy J. Fernandes

Have you heard of various marketed products like tea, cooking oil, beauty creams, shampoos, etc. with something called “Antioxidants”. Do we know what it is? Isn’t it strange and weird that we have bought them just because the advertisement says it is good for our health, beauty, hairs, eyes, etc ...!!!!!! Need to check out right!!!!

We have been using these products, now-a-days but, what is it that is being consumed or used by us through these products??? Well the word “Antioxidants” might be new to all of us but, we have been using/ consuming them through our daily diet. Let’s find out the answers to some inquisitive questions what they are?... who produces them?... From where do we get them?... why is it so important?...

**Antioxidants** the word itself says “”Anti-Oxidants”” i.e. something that prevents or is against the phenomenon of oxidation. Now, Oxidation is a chemical reaction in which electrons or hydrogen is transferred from one substance to an oxidizing agent.



[http://healthyprotocols.com/image\\_antioxidant.jpg](http://healthyprotocols.com/image_antioxidant.jpg) (Retrieved on 20th April, 2014)

This oxidation reaction produces free radicals due to which a chain reaction starts in the cell that leads to cell death or cell damage. In order to terminate this chain reaction these antioxidants act as reducing agents by removing these free radical intermediates to inhibit oxidation reaction from occurring in the cells (shown in image below).

**Antioxidants** are a group of plant chemicals (Phyto-chemicals where ‘phyto’ in Greek means ‘plants’) that are present in our dear plants for their protection from UV radiations, pests, pollution ,stress ,drought and various plant diseases.

A phyto-chemical is a natural bioactive non reactive compound found in plants that works with nutrients and dietary fibers to protect and prevent diseases. The word phyto-chemical in itself explains its properties i.e. “fight-o-chemicals” something that fights to protect our health.

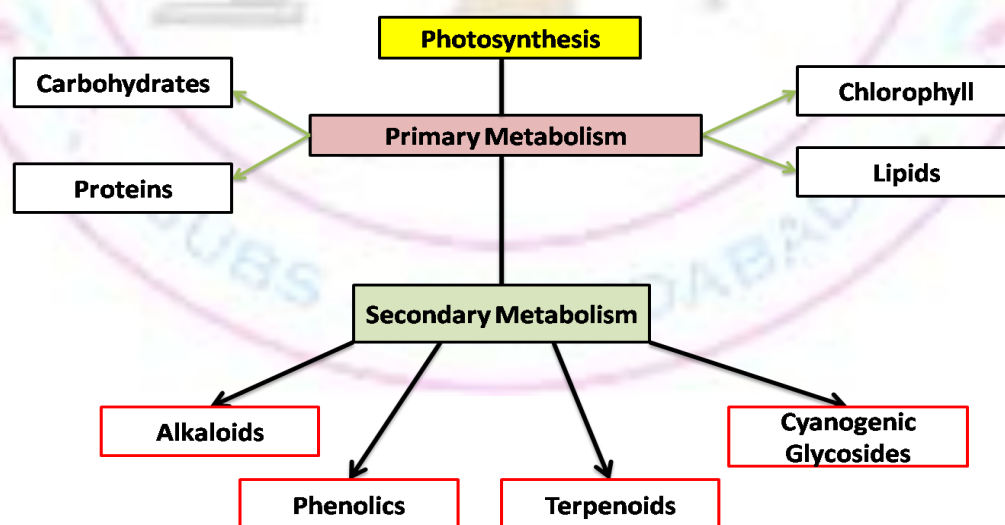


Phyto-chemicals are dietary supplements found in fruits, vegetables, legumes, whole-grains, nuts and seeds. Phyto-chemicals have a complementary and overlapping mechanism of action in the body like antioxidant effects, modulation of detoxification enzymes, stimulation of the immune system, hormonal changes and antibacterial and antiviral properties. All those fruits and vegetables with bright colors like yellow, orange, red, green, blue and purple.

**Antioxidants** active compounds that are present in our diet i.e., vegetables, oil seeds, herbs or spices. Antioxidants can be used as components of various drugs because of their therapeutic values. Food antioxidants have a significant role as physiological and dietary supplements. These have various properties like anti-bacterial, anti-viral, anti-inflammatory, anti-allergic and anti-thrombic.

**Antioxidants** have their innate capability to hold back oxidation process in human body as well as food products. Many chronic diseases can be prevented solely by consuming antioxidant rich diet like cancers of various types, blood pressure, cholesterol, arthritis, and so on. Extensive research works are going on in the field of pharmacological studies on plant based antioxidant extraction, isolations and finding the extent of its effect in curing various diseased conditions in living organisms.

These **Antioxidants** are produced in plants as a result of the most famous phenomenon that controls the entire events in the food chain and food web, in other words “ the Existence of Life on the Earth” i.e., Photosynthesis.



The **antioxidants** are produced from the secondary metabolite mentioned above i.e., Phenolics. This group of Phenolics produce phyto-chemicals that are having the antioxidative properties they are phenols and flavonoids.

Phenol is the simplest class of this group of natural compounds. Phenols exhibit several important antioxidant properties that help as protective agents against the free radicals mediated diseases. Phenolic compounds are one of the chief phytochemicals which are established universally as antioxidants or free radical scavengers and act as reducing agents and metal chelators.

Flavonoids have many properties in them like anti-microbial, cytotoxicity, anti-inflammatory, anti-tumor, anti-allergic, vascular activity and enzyme inhibition. It acts as a powerful antioxidant which can protect the human body from free radicals and reactive oxygen species. Its examples are luteolin, catechins, Vitamin C, Vitamin E,  $\beta$ -carotene. They protect biological system against harmful effects of oxidative processes on macromolecules like carbohydrates, proteins, lipids and DNA.

A wave of herbal products has hit the market today that has led our focus on this special and important phyto-chemical which not only is protective and useful to plants but even to those who are using them.

**Antioxidants** are the God's surprise gift to us as an indication that naturally available chemicals are to be relied more in comparison to the synthetic chemicals. So consume more of the green leafy vegetables and bright colored fruits and vegetables to stay away from the bitter tablets and capsules in the future. So, be one with the Nature and Stay Healthy.

## GREEN TEA: IS IT HEALTHY REALLY?

Nikita Sapra

Green tea is a product made from the *Camellia sinensis* L. plant. It can be prepared as a beverage, which can have some health effects. Or an “extract” can be made from the leaves to use as medicine.

Green tea is **LIKELY SAFE** for most adults. Green tea extract is **POSSIBLY SAFE** for most people for short-term use. Too much green tea — more than five cups per day, for example — is **POSSIBLY UNSAFE**. It can cause side effects because of the caffeine.

Drinking very high doses of green tea can actually be fatal. The fatal dose of caffeine in green tea is estimated to be 10-14 grams (150-200 mg per kilogram).

Caffeine is **POSSIBLY SAFE** in children in amounts commonly found in foods.

**Green tea interacts with many medications, which are explained below:-**

### **Side Effects:**

- 1. Stomach upset:** High dosage of green tea can lead to stomach upset and constipation.
- 2. Pregnancy and breast-feeding:** If you are pregnant or breast-feeding, green tea in small amounts is **POSSIBLY SAFE**. Do not drink more than 2 cups a day of green tea. This amount of tea provides about 200 mg of caffeine. Consuming more than this amount has been linked to an increased risk of miscarriage and other negative effects. Caffeine passes into breast milk and can affect a nursing infant. Don't drink an excessive amount of green tea if you are breast-feeding.
- 3. “Tired blood” (Anemia):** Drinking green tea may make anemia worse.
- 4. Anxiety disorders:** The caffeine in green tea might make anxiety worse.
- 5. Bleeding disorders:** Caffeine might increase the risk of bleeding. Don't drink green tea if you have a bleeding disorder.



- 6. Heart conditions:** Caffeine in green tea might cause irregular heartbeat.
- 7. Diabetes:** Caffeine might affect blood sugar control. If you drink green tea and have diabetes, monitor your blood sugar carefully.
- 8. Diarrhoea:** Green tea contains caffeine. The caffeine in green tea, especially when taken in large amounts, can worsen diarrhea.
- 9. Glaucoma:** Drinking green tea increases pressure inside the eye. The increase occurs within 30 minutes and lasts for at least 90 minutes.
- 10. High blood pressure:** The caffeine in green tea might increase blood pressure in people with high blood pressure. However, this does not seem to occur in people who regularly drink green tea or other products that contain caffeine.
- 11. Liver disease:** Green tea extract supplements have been linked to several cases of liver damage. Green tea extracts might make liver disease worse.
- 12. Weak bones (osteoporosis):** Drinking green tea can increase the amount of calcium that is flushed out in the urine.



## **Inventory of space born ocean observing systems**

Gunjan Motwani

Interactions between electromagnetic radiation and matter form the base of Remote sensing measurements. The visible region (400 to 700 nm) of the electromagnetic spectrum is the most important band for remote sensing of water quality. The attenuation of infrared (around 700 nm to 15 m) and microwave radiation (1 mm to 30 cm) is very high in water and thus can only be used for observing surface phenomena such as algal blooms.

Remotely sensed images provide a synoptic view of the landscape, which is impossible to obtain using conventional *in-situ* measurements. Since 1970, remotely sensed imagery has been used to map coastal areas and their components such as water quality, bottom features, bathymetry, coastal dynamics, terrestrial and marine habitats and certain coastal hazards. The use of this method has gained increasing importance to understand the behaviour of coastal environments because of its capacity to provide both spatial and temporal information cost-effectively. One of the uses of remotely sensed image data is in the monitoring of water bodies. Moreover, the importance of time series satellite imagery and derived products, for showing coastal and marine spatio-temporal trends on longer time scales is widely recognized, especially in relation to climatic variability. Standard procedures and algorithms are available to measure and map various features of the water. The present article provides a brief overview of space born platforms and sensor system together with their measured variables available for the remote sensing of the oceans, as follows:

The first satellite-based sensor devoted to water quality measurements was the Coastal Zone Color Scanner (CZCS), launched by National Aeronautical and Space Administration (NASA) on the Nimbus-7 satellite in 1978. It obtained true global data of phytoplankton activity, its seasonal variability and primary production and chlorophyll concentration. Since then the quality of remote sensing data for monitoring water has improved. The next sensor developed by German Aerospace Agency (DLR) was Modular Optoelectronic Scanner (MOS) launched by Indian Polar Satellite Launching Vehicle (PSLV) on-board IRS-P3 satellite, launched in 1996. Its MOS-A and MOS-B sensors were used for atmospheric correction and generating information on aerosol content. Another sensor launched by Japan in 1996 was Ocean Colour and Temperature Sensor (OCTS) onboard Advanced Earth Observation Satellite (ADEOS). It provided

ocean colour measurements along with sea surface temperature (SST). SeaWiFS (Sea viewing Wide Field Sensor) launched by NASA and Orbital Science Corporation (OCS) in 1997 continued on this path and has produced good results of biological information in a routine manner. Airborne instruments such as AISA (Airborne Imaging Spectrometer for Application), CASI (Compact Airborne Spectrographic Imager and HyMap have been determined to be feasible for monitoring small areas in Scandinavia and Germany. Data from airborne sensors can also be used for developing retrieval algorithms for space borne sensors such as Moderate Resolution Imaging Spectroradiometer (MODIS) and Medium Resolution Imaging Spectrometer (MERIS) (Medium Resolution Imaging Spectrometer). MODIS sensors were launched by NASA on the TERRA and AQUA satellites in 1999 and 2002 respectively. The MERIS was launched in 2001 by European Space Agency's (ESA) onboard ENVISAT.

Space borne sensors designed for other applications have also been useful for water quality monitoring. For example, LANDSAT TM data have been used for the estimation of total suspended sediments over eutrophic waters and chlorophyll distribution in lake. NOAA AVHRR data have been used for monitoring light attenuation (a measure of turbidity) in a coastal area by. LANDSAT TM, SPOT and Indian Remote Sensing (IRS) satellite data together were used to generate baseline data for coral reefs of the entire Indian coast.

IRS 1A and 1B launched on 17<sup>th</sup> March 1988 and 29<sup>th</sup> August 1991 respectively, has been found to be useful in providing information on the extent and condition of coastal habitats, coastal processes and water quality parameters. Launch of IRS 1C on 28<sup>th</sup> December 1995 opened up new vistas of applications in coastal zones like coral reef zonation and improved delineation of coastal features etc.

Indian Space Research Organisation (ISRO) launched its first ocean remote sensing satellite IRS-P4 in May 1999 has been used for atmospheric and terrestrial studies along with biological oceanography. Normalized water leaving radiances of Ocean Colour Monitor (OCM) for visible bands were obtained after applying the atmospheric correction were used as input to estimate the concentration and distribution patterns of chlorophyll-*a* based on the approach proposed by O'Reilly 1998. The OCM data has also been used for potential fishing zone (PFZ) forecast along with Sea Surface Temperature (SST) data.





## **LESSONS FROM NATURE**

Dr. Archana Mankad

The best time of the year for any plant is when it blooms and sends a message to all about its inner beauty and strength. And then comes the most difficult time for the plant..to send its most precious possession, the seeds away to struggle and establish but far away from itself...Yes, it is good for the seed to be away but for the plant it is a brave act of letting the seeds GO.

Children are like kites, you spend a lifetime trying to get them off the ground. You watch them lifted by the wind and assure them that someday, they will fly. Finally, they are airborne and you know it won't be long before they will soar, free and alone. And then, its that time when you have to Let them go, because just letting go does not make your affection less but it allows them to grow and flourish and spread your message of love. Only then do you know that you did your job.

When life sets you up with a challenge, there's a reason for it; it's meant to test your courage and willingness to make a change and take a chance on something new. There's no point in denying that things are different now, or being fearful of the next step. The challenge will not wait even if you hesitate. Life only moves in one direction – forward. This challenge is your chance to let go of the old and make way for the new. Your destiny awaits your decision.

“If we can just LET GO and trust that things will work,

then we can enjoy the pleasure of freedom”

**AN OVERVIEW OF THE ACTIVITIES OF  
GUJARAT UNIVERSITY BOTANICAL SOCIETY (GUBS)  
DECEMBER 2013-APRIL 2014**

**Science Excellence 2014** (SCIXL 2014), the 5<sup>th</sup> Science Excellence was held on Saturday, 4<sup>th</sup> January-2014 amidst the winter chill. The excitement and enthusiasm of the participants who came from all over Gujarat was palpable. A quick registration was followed by a very warm Inaugural function. Resident Director, ESSAR Ahmedabad Mr. Jayesh Buch, was the Chief Guest. Our Honourable Vice Chancellor, Dr. Mukul Shah, Registrar, Dr. B. V. Patel, and Secretary General SCIXL 2014, Dr. Archana Mankad were the dignitaries on the dais. Dr. Archana Mankad gave a brief overview of the event.

In his Inaugural speech, Mr. Jayesh Buch expressed appreciation and congratulated the organizers for bringing the universities, colleges and research institutes from all over Gujarat under one umbrella! He conveyed his best wishes and also shared his precious words of wisdom, much to the delight of one and all present. Our Honourable Vice Chancellor, Dr. Mukul Shah enthralled the gathering with his motivating and highly inspirational speech. Dr. B. V. Patel congratulated the organizers and conveyed best wishes to the participants during his very motivational address. Dr. Hitesh Solanki had the important task of thanks-giving at the end of the function. Dr. Hitesh Solanki and Dr. Himanshu Pandya coordinated the whole programme with a big band of student volunteers who were quite excited in their coloured badges. Dr. Himanshu Pandya alongwith Dr. Hitesh Solanki made tremendous efforts in arrangements for a lovely Food Plaza and enchanting registration kit.

Science Excellence has always witnessed participation from almost all universities of the state. This year too, the number of participants was more than 900 who represented Gujarat University, Bhavnagar University, Veer Narmad South Gujarat University, Hemchandracharya North Gujarat University, Sardar Patel University, Maharaja Sayajirao University, Kachchh University, Saurashtra University, Nirma University, Pandit Deendayal Petroleum University, affiliated colleges and several research institutes. Like last time, this year too, the basic format had been modified to allow young teachers to present their research findings and compete for the coveted prizes. This was welcomed by one and all.

The much awaited Technical sessions took off on a high note with the participants battling it out for the coveted prizes in oral and poster presentations at four levels Undergraduate / Postgraduate / Research / Faculty in 17 subjects. The chill of the morning was just right for breaking the night fast with the hot methi gota and the cup of Tea and Coffee! The seasonal undhiyun – puri - jalebi with a dash of chaas was the main attraction of the sumptuous lunch, while crunchy cookies along with tea and coffee in the evening. The Valedictory function was almost as scheduled. The students thronged in large numbers and hurriedly occupied seats to look eagerly for the announcement of results. The Judges from various Universities and colleges were given Mementos for their commendable task throughout the day! The Prize distribution was the main event and pleased one and all since almost all colleges, universities, research institutes and departments received their share of applause!

The day ended with a sense of accomplishment and a feeling of pleasure that all is well!

The students from various science colleges and PG departments of Gujarat University took the most popular State Level **Minaxi Lalit Science Award Test-2014** on 19<sup>th</sup> January 2014. The test is an initiative of Gujarat Science Academy, Ahmedabad to popularize science learning and develop scientific writing among the students. It is coordinated by the Department of Botany since many years. The first and second prize winners in various subjects at UG and PG levels were given cash prizes and certificates by GSA, Ahmedabad in a special ceremony during the Science Congress at HNGU, Patan.

The students of the department participated in a daylong event called **Food Festival 2014**. The event was totally managed by the students under the leadership of Ms. Deepa Rai, M Sc Sem IV - Botany. There were counters for various traditional delicacies, sumptuous snacks, healthy bites and cool sips. The traditional treats on the counters were Litti Chokha, Vagharelo rotlo, Chokha no rotlo, Khichu, mawa Jalebi and Kopro na ladoo while Diet bhel and Idli sambhar were sumptuous snacks and all time favourites. The cash counter was seen abuzz with visitors from various departments of USSC during lunch time and everyone enjoyed their choice of food. Infact, the Judges had a tough time evaluating the participants on the basis of the presentation and the taste. This was also an opportunity for the students to realize their entrepreneurship abilities. Crispy dumplings and Fruit flavored Panipuris were the most sought after items during the day. The students teamed up to advertise, market and



video shoot the event. The venue was musical and cool with a nice serene setup just outside the department. It was a novel experience for all and provided the much needed change from a routine and allowed the students to realize their abilities in a different way. One of the objectives of the event was to assess the profit and loss by all participants so as to realize their shortcomings, if any.

The **Workshop on financial Planning for Young Investors** was organized with the help of Ms.Palak Lotiya, certified trainer from SEBI. The session started with a video presentation of “One Idiot-an IDFC initiative” which conveyed the essence of the workshop very effectively. Ms.Palak explained the need for saving, appropriate investment and the risks to be taken care of to the participants.

The staff and the students of the Department visited the **Sardar Krushinagar Agricultural University, Dantiwada as part of the Botanical Excursion** in the month of February. **The University is located at Sardarkrushinagar, the main Campus of Sardarkrushinagar Dantiwada Agricultural University. Sardarkrushinagar campus is located 27 kms away from Palanpur. Palanpur is the district headquarters of Banaskantha and a broad gauge railway junction on Ahmedabad-Abu road- Delhi railway tract. It is also well connected through state transport bus services. Transport facility from Palanpur to Sardarkrushinagar is provided through a fleet of University buses. The district of Banaskantha is having natural combination of Agricultural land, hills, forests and dry sandy pastures. The fascinating view of the mountain ranges of Ambaji Hills and its surrounding forest adds to its scenic beauty and charm.** A visit to the Agricultural University is a very nice learning experience because the students get to see so many types of field trials at a time and experience the significance of several agro techniques. It also sensitizes them towards valuing the hard work of a researcher and appreciating the efforts of the state government in strengthening this very important sector. The students were thrilled to see the excellent collection of germplasms of some very interesting plants like Gerberas, Olive and Amaranthus and field trials of various experiments. The shade requirements of Gerberas and how to study it was very nicely demonstrated. Olive plant is a novel addition all the way from Israel to the fields at Dantiwada and the researchers there are hopeful that the plants would flower and fruit this year. The whole place had excellent drip irrigation to adequately conserve water and yet allow for sufficient greenery. Dr. Ravi

Chauhan, Dean, Chimanbhai Patel Agriculture College, Sardar Krushinagar Dantiwada Agricultural University was extremely supportive and gave permission for the visit to the fields, green houses, medicinal plots, and research labs. He also generously made all arrangements for food and a quick visit to the Dam site nearby. His colleagues walked an extra mile for the group and showed them various plants and the academic interactions with them were well taken by all the students.

The staff and students of the department participated in a day long **Workshop on Intellectual Property Rights Awareness - 2014 (WIPRA - 2014)** organized by the GUJCOST-IPR Cell, Department of Botany, Gujarat University at Science City on Thursday, 6<sup>th</sup> March 2014. The event coincided with the Science week celebrations by GUJCOST called Science Carnival 2014. Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. IP is protected in law by, for example, patents, copyright and trademarks, which enable people to earn recognition or financial benefit from what they invent or create. By striking the right balance between the interests of innovators and the wider public interest, the IP system aims to foster an environment in which creativity and innovation can flourish. A quick registration was followed by an impressive Inauguration by Mr. Jatin Trivedi, Chief Guest and distinguished resource person from Trivedi and Co., Member Secretary of GUJCOST and Guest of Honour, Dr. Narottam Sahoo and also on the dais were Dr. Mayuri Pandya, Guest of Honour and distinguished resource person from Sir L. A. Shah Law College, along with Mr. Alpesh Pathak, Guest of Honour and distinguished resource person from INTAS Pharmaceuticals. Mr. Trivedi gave an overview of the objective of the workshop in the Keynote address. It was followed by the first technical session by Dr. Mayuri Pandya. Dr. Mayuri explained the basics of IPR in a very simplified yet very creative and interactive manner. Her lecture generated a lot of interest and excitement among the participants. The second technical session was the lecture by Mr. Jatin Trivedi. He gave an in depth description of the legal nitty-gritty of the IPR in his novel way. He sensitized the participants on the need of valuing intellectual property in their day to day handling. The third Technical session was conducted by Mr. Alpesh Pathak. Mr. Alpesh demonstrated the significance of IPR by using specific cases recently handled in the Pharmaceutical sector. In all the day was abuzz with excitement of learning and was supplemented with very innovative and creative presentations by Mr. Vijay Mehta, M Phil-

Bioinformatics from the department. The registration Kit bags and Lunch for the participants was sponsored by GUJCOST. The participants also received a certificate of participation.

The members of GUBS participated in the seminar on **Women Empowerment** on the occasion of Women's Day at the Senate Hall on Saturday, 8<sup>th</sup> March 2014. The programme jointly organized by the Women Development Cell (WDC) and GUBS witnessed enthusiastic involvement by the students from various departments of the university. The distinguished panel on the dais included Dr.M.N.Patel, Vice Chancellor, Gujarat University, Mrs.Nita Shah, Gujarat Informatics Limited, Ms. Ruzan Khambhatta, Founder Police Heart, Dr.Rajshri Bhatt, President Lions Club and Head, Department of Statistics, Dr.B.V.Patel, Registrar, Gujarat University, Dr.Savita Gandhi, Chairperson WDC and Head, Computer Science Department, And Dr.Archana Mankad, Member Secretary-WDC and Head, Department of Botany. The speakers highlighted the need for empowerment of women in different sectors. A videoshow highlighting the powerful women from India and Gujarat alongwith the appropriate musical backdrop to the event was apropos the theme and was well appreciated by all. The event was followed by lunch and all enjoyed hot puris with tasty mix vegetable, dhokla and cold matho.

The Members of GUBS got a unique opportunity to get expert tips on Personality development during a **Seminar on Personality development for success 2014** (PDS 2014) in a lecture by Mr. Lalit Shroff from the Lion's Club. Infact, the event also witnessed a prize distribution ceremony for the competitors of **Trees for Life** by the Chief Guest Mr. Rakesh Patel from Lions Club. Mr. Shroff generated a lot of passion in the students to recognize their strengths and identify their weaknesses, an aspect which is fundamental to the development of Personality. An **Interactive Forum called Safety and Security for All-2014 (SASA-2014)** was organized for the members of GUBS and Ms.Ruzan Khambhatta was invited to be the resource person for the same. She gave a very explanatory account of Police HEART and urged one and all to register not only themselves but also their near and dear ones online. She also motivated the students in her own special way. Nostalgia filled the air when she recollected her experiences as a student of USSC, Gujarat University.

The **annual function of Gujarat University Botanical Society (GUBS)** was organized on Saturday 12<sup>th</sup> April-2014. It was that time of the year



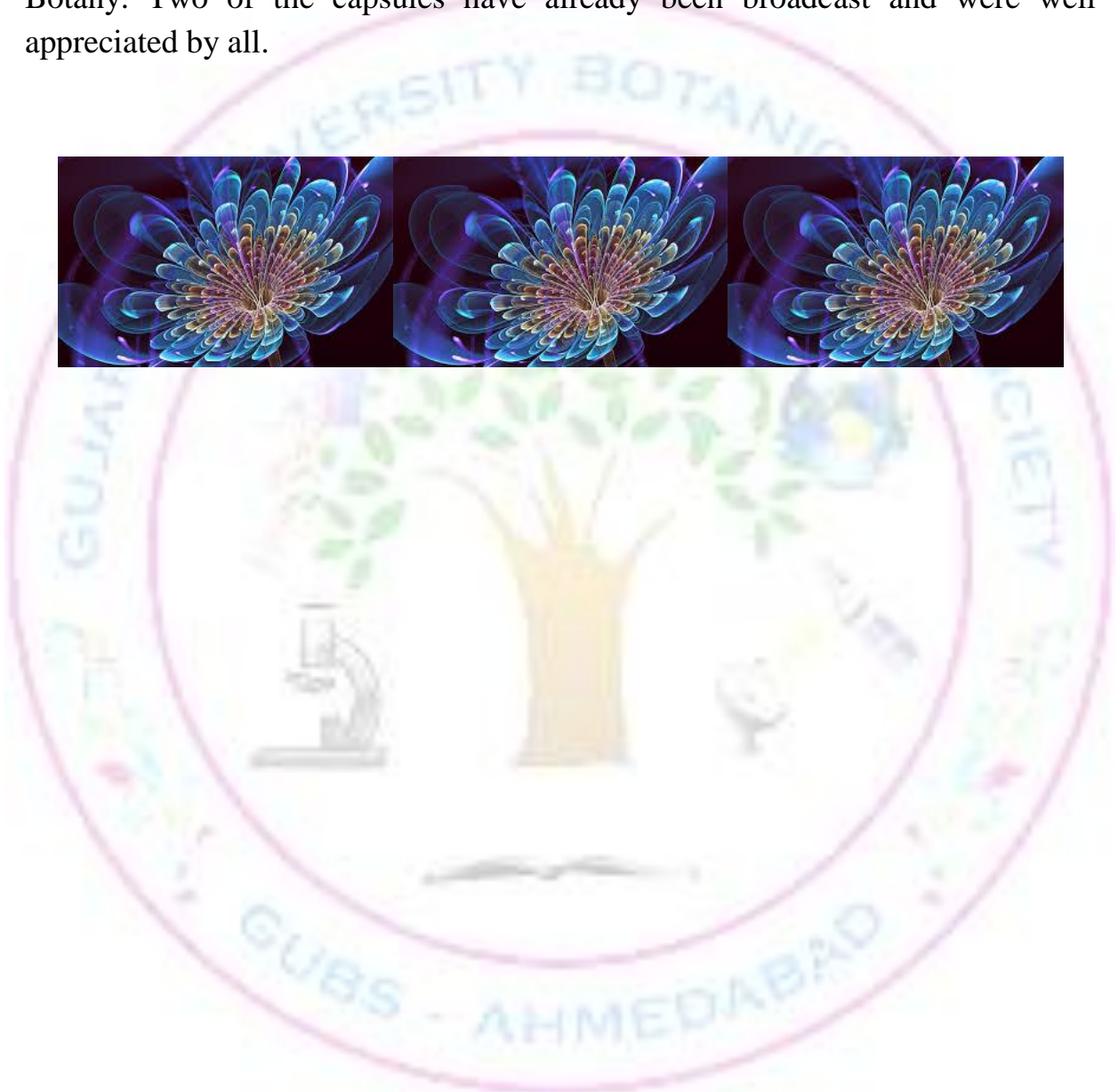
when, like every year, we acknowledge and appreciate the achievements of the students during the year. The programme was special because our Hon. Vice Chancellor, Dr. M. N. Patel was the Chief Guest. Dr. B. V. Patel, Registrar, Gujarat University was the Guest of Honour. A very creative presentation showcased the various activities of GUBS. A quick welcome was followed by the main attraction of the function which was the distribution of certificates and prizes to the winners during several events conducted during the year for the members of GUBS. Dr. B. V. Patel gave away the prizes and encouraged the members in his special way.

This year also witnessed the launching of **GUBS AWARDS** called as **GOLDEN PETAL AWARDS**, a novel endeavour to acknowledge, appreciate and bring to limelight the best during the academic year among the students of the department. It is an initiative to generate interest and highlight the significance of wholehearted participation and commitment towards both curricular and co-curricular activities. A very creative memento and a very impressive certificate was specially designed by the creative team of the department and was appreciated by all. There were different categories of **GOLDEN PETAL AWARDS** like **GOLDEN PETAL AWARD FOR EXCELLENCE**- for the students who proactively and wholeheartedly displayed excellence during various events of the department, **GOLDEN PETAL AWARD FOR ACADEMIC ACHIEVEMENT**- for the toppers and all those who were awarded fellowships by UGC/DST etc, **GOLDEN PETAL AWARD FOR STUDENT OF THE YEAR**- for the overall best not necessarily a topper, **GOLDEN PETAL AWARD FOR THE RESEARCHER OF THE YEAR**-for the excellent publications and overall support to the juniors, and the best was **GOLDEN PETAL AWARD FOR OUTSTANDING ACHIEVEMENT**-for all those who won prizes during oral/poster presentations at seminars/ conferences outside Gujarat University and made us proud and all those who were conferred special fellowships. The Golden Petal awards were given away by Hon. Vice Chancellor, Dr. M. N. Patel and this was followed by his blessings and his words of wisdom.

Participation in **GURUVANI 90.8 FM - Gujarat University Radio Unbound 90.8.F.M:**

Dr. Archana Mankad organized a talk cum interview programme of the Researchers of the department. The research scholars gave a very informative talk in the form of an interview on GURUVANI 90.8 FM - Gujarat University

Radio Unbound 90.8.F.M., wherein they described in very simple manner the kind of researches they are pursuing. The experience of being inside the studio was indeed very thrilling and all the same they appreciated the amount of hard work that is expected to be put in by those in this career. The exercise was also to identify the hidden potentials in the students in expression and speaking out fearlessly or explaining in a very simple manner thus promoting the subject, Botany. Two of the capsules have already been broadcast and were well appreciated by all.



**GOLDEN PETAL AWARDS: 2013-2014**

***CONGRATULATIONS TO THE WINNERS***

**A. Golden Petal Award for Excellence** goes to those who have displayed excellence of the student in various fields:

1. The Golden Petal Award for **Excellence in Presentations** was awarded to Ms. Nikita Sapra
2. The Golden Petal Award for **Excellence in Event Management** was awarded to Ms. Deepa Rai
3. The Golden Petal Award for **Excellence in Photography** was awarded to Ms. Shirin Qureshi
4. The Golden Petal Award for **Excellence in Creativity** was awarded to Mr. Vijay Mehta
5. The Golden Petal Award for **Excellence in Entrepreneurship** was awarded to Ms. Tasneem Shaikh
6. The Golden Petal Award for **Excellence in Sciotoons** was awarded to Ms. Harita Pagi

**B. Golden Petal Award for Academic Achievement** goes to Toppers:

The Golden Petal Award for Academic Achievement was awarded to

7. Ms. Monica Sachdev
8. Ms. Kinjal Prajapati
9. Ms. Batul Lokhandwala
10. Ms. Janki Shah
11. Ms. Kalyani Kansara

**C. Golden Petal Award for Academic Achievement** goes to recipients of **Rajiv Gandhi National Fellowship** by UGC

The Golden Petal Award for Academic Achievement was awarded to

12. Mr. Chirag Patel
13. Mr. Rikin Patel



14. Mr. Sandip Gamit

**D. Golden Petal Award for Academic Achievement** goes to recipients of Maulana Azad National Fellowship by UGC

15. The Golden Petal Award for Academic Achievement was awarded to Mr. Qureshmatava Umerfaruq

**E. Golden Petal Award for Academic Achievement** goes to recipients of Special fellowship:

16. The Golden Petal Award for Academic Achievement was awarded to Mr. Vishal Desai

**F. Golden Petal Award for Academic Achievement** goes to recipients of Inspire Fellowship by UGC as JRF

17. The Golden Petal Award for Academic Achievement was awarded to Ms. Shirin Qureshi

**G. Golden Petal Award for Academic Achievement** goes to recipients of Inspire Fellowship by UGC as SRF

The Golden Petal Award for Academic Achievement was awarded to

18. Mr. Prasanthkumar

19. Ms. Ruby Patel

**H. Golden Petal Award for Academic Achievement** goes to recipients of Scholarship under Women Scientist Scheme by DST

20. The Golden Petal Award for Academic Achievement was awarded to Ms. Kuntal Shah

**I. Golden Petal Award for Student of the Year** goes to the overall best student from M Sc class

21. The Golden Petal Award for Student of the Year was awarded to Ms. Deepti Sharma

**J. Golden Petal Award for Researcher of the Year** goes to the overall best research related activities-publications / participation in seminars, conferences, workshops, helping and supporting the juniors etc

The Golden Petal Award for Researcher of the Year was awarded to

22. Mr. Prasanthkumar

23. Ms. Urvi Gupta

**K. Golden Petal Award for Outstanding Achievement** goes to those who have presented papers and won prizes in academic events organized outside Gujarat University or have been awarded extraordinary international fellowship

The Golden Petal Award for Outstanding Achievement was awarded to

24. Ms. Pankti Bhavsar

25. Ms. Shirin Qureshi

26. Mr. Qureshimatava Umerfaruq


27. Mr. Rohan Thakkar

28. Ms. Gunjan Motwani






# FUN WITH SCIENCE

**NANOSCIEN TOONS** 

Nanotechnology is a field of research and innovation concerned with building things and devices on the scale of atoms and molecules.

Nano in Greek means "dwarf". A nanometer is one-billionth of a meter i.e. ( $10^{-9}m$ ): ten times the diameter of hydrogen atom.

The diameter of human hair is, on an average 80,000 nanometer.



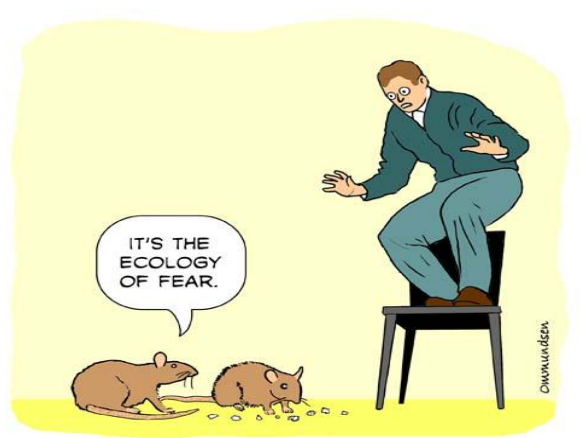
"Take it Sir! What ever you like. Veg., Nonveg, Italian, Thal, Continental! Everything is in plenty. See carefully! It is **NANOFOOD** Sir."



I can chew them all in 20 minutes

I have 500 papers in 20 years of my research life

FRADOBI SANKHILA



IT'S THE ECOLOGY OF FEAR.

©mnuuudex

I WAS JUST RUBBING STICKS TOGETHER FOR FUN - I DIDN'T REALIZE I WAS DOING BASIC RESEARCH.




©2008 HTTP://BALOOCARTOONS.WORDPRESS.COM Bala

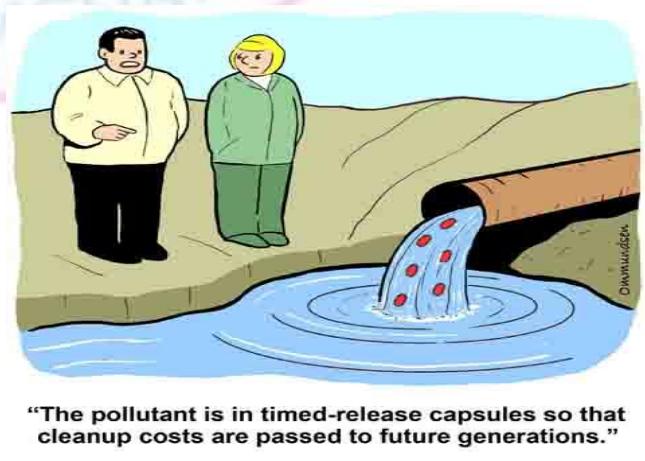
**SCIEN TOON**

APARTHEID say NO to it.

Dr. Nelson Mandela



"So what if he is black! Go and play with him. Don't behave like humanbeings"



"The pollutant is in timed-release capsules so that cleanup costs are passed to future generations."



# GUBS



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