

e-NEWS LETTER

Volume II, Issue-I, November-2014

Gujarat University Botanicals Society (GUBS)



**Department of Botany
University School of Sciences
Gujarat University
Ahmedabad – 380009, India**

ANKUR

Volume II, Issue-I, November-2014

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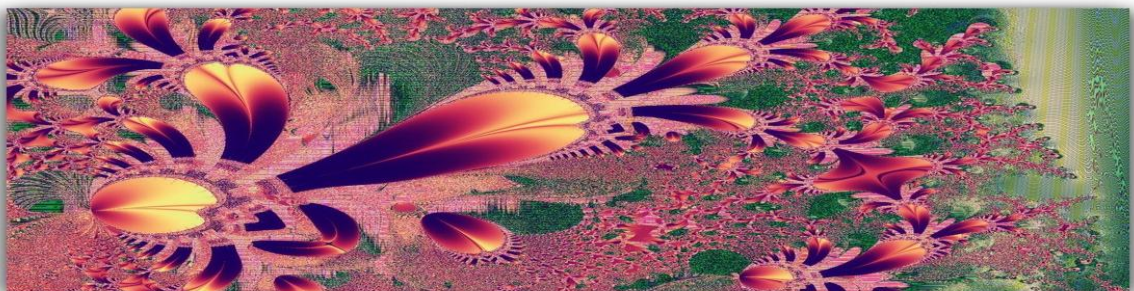
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ANKUR

..Sprouting thoughts

Growth and development is the essence of life on earth. Ankur has grown and is now one year old. It is a platform for young writers to share articles, news, views and create awareness. Ankur is a synergy of researchers from Botany, Bioinformatics and Climate Change Impacts Management. It would allow information to flow into an idea that can lead towards interdisciplinary research. Ankur is being taken care of by the editorial team and we hope, Ankur establishes firmly in the scientific community and its fragrance would travel far and wide.

Editorial Team

Dr. Archana Mankad

Dr. Hitesh Solanki

Dr. Himanshu Pandya

Ms. Ruby Patel

PATRON'S MESSAGE

Blooms are nature's most spectacular creations. Besides fulfilling their natural duty of producing seeds, they beautify, spread a very promising message of life and that is the message of achievement. The plant achieves and shares the happiness with the whole world. Plants teach us that no matter how small but each day should be a day of achievement, each day we should learn something new and achieve a new dimension to add to our personality.

Ankur has grown and today it is one year old. It is now set to establish, grow and achieve its objectives.

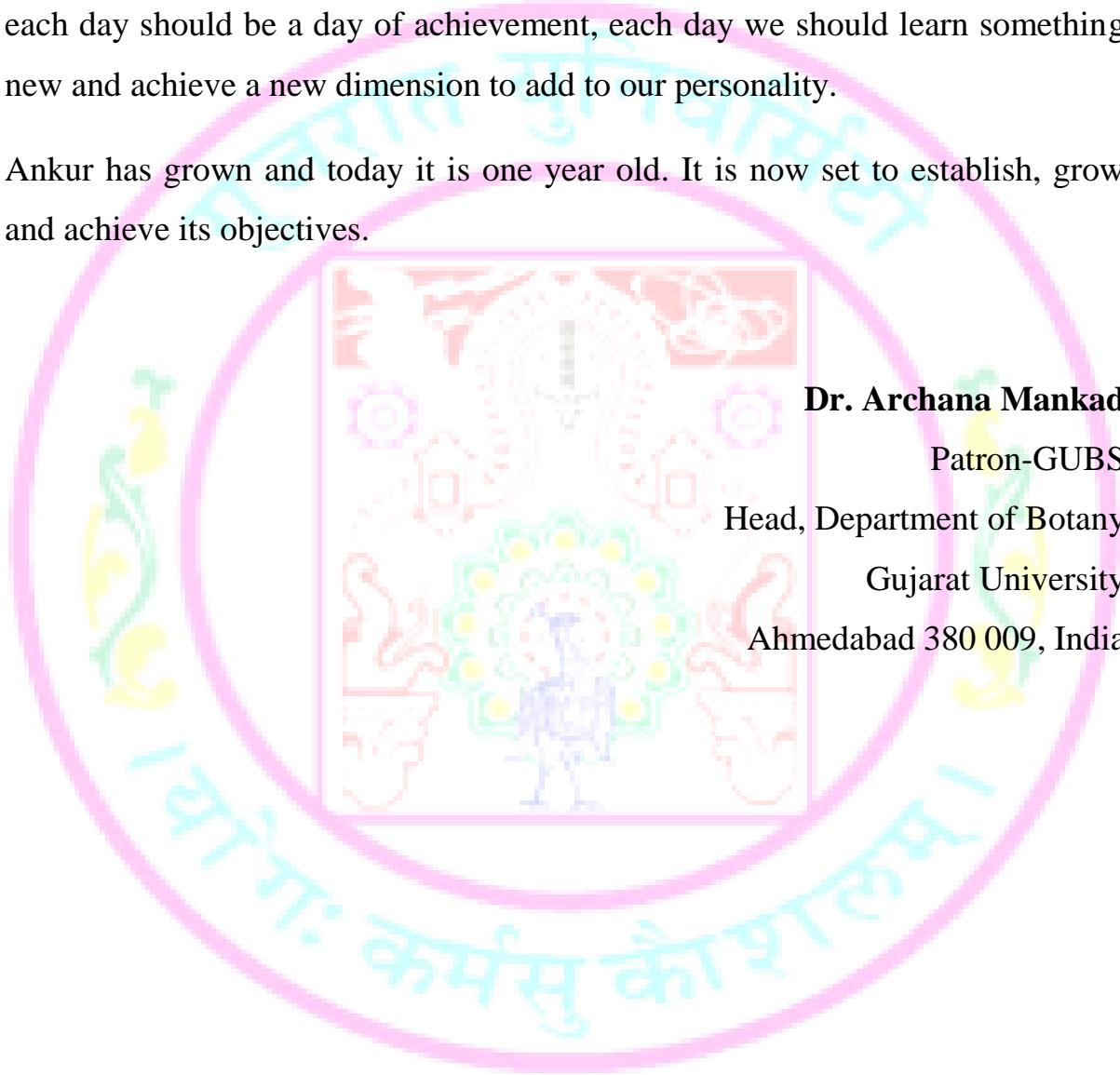
Dr. Archana Mankad

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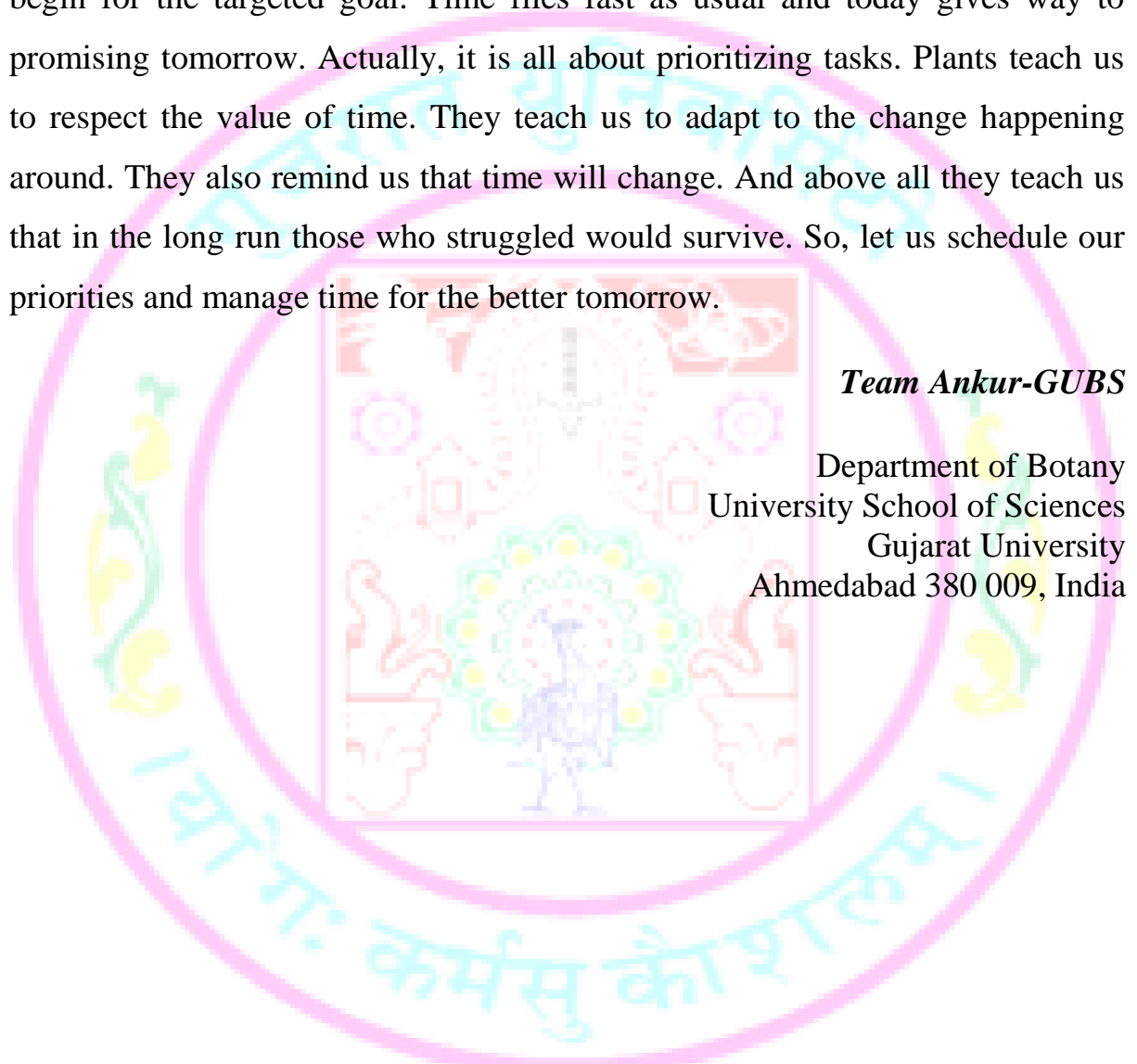
Sprouting thoughts.....

Dear Scholars,

The secret of getting ahead is getting started with the progressive idealism. The secret of getting started is keeping your complex tasks simple and then just begin for the targeted goal. Time flies fast as usual and today gives way to promising tomorrow. Actually, it is all about prioritizing tasks. Plants teach us to respect the value of time. They teach us to adapt to the change happening around. They also remind us that time will change. And above all they teach us that in the long run those who struggled would survive. So, let us schedule our priorities and manage time for the better tomorrow.

Team Ankur-GUBS

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MESSAGE FROM GUBS PRESIDENT

Development at any phase is always linked with technology and technology happens when there is advancement in science. Learning science is an interdisciplinary field that works to further scientific understanding of learning as well as to engage in the design, implementation of learning innovation and the improvement of instruction methodologies. Modernization in every aspect of life is the greatest example of the implementation of science and technology for every nation. This volume of Ankur is dedicated to share the newer and emerging learning tools of science education. These tools can help to connect students with scientific temperament. Ankur provides us great platform to express our scientific desires.

Ms. Ruby Patel

President- GUBS
SRF-DST INSPIRE Fellow
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ARBOSCULPTURE

Archana Mankad

Arbosculpture, also known as Tree shaping uses living trees and other woody plants as the medium to create structures and art. There are quite a few different methods used by the various artists to shape their trees, which share a common heritage with known and practised artistic horticultural and agricultural practices. Most artists use grafting to deliberately induce the inosculation of living trunks, branches, and roots, into artistic designs or functional structures. Such interesting tree shapes can add a lot of value in a landscape both outdoors and indoors.



BONSAI

Himanshu Pandya

Bonsai is a Japanese art form using miniature trees grown in containers "Bonsai" is a Japanese word meaning Tree on a Tray. A bonsai is created beginning with a specimen of source material. This may be a cutting, seedling, or small tree of a species suitable for bonsai development. Bonsai can be created from nearly any perennial woody-stemmed tree or shrub species that produces true branches and can be cultivated to remain small through pot confinement with crown and root pruning. Bonsai uses cultivation techniques like pruning, root reduction, potting, defoliation, and grafting to produce small trees that mimic the shape and style of mature, full-size trees. Flowering and fruiting trees make very interesting Bonsai specimens. Frequent watering is the main care needed for a Bonsai. Bonsai is characterized by its size and styles. Big Bonsai is most common but miniature Bonsai has a unique appeal. Some of the most popular Bonsai styles are:

Formal upright or *chokkan* style trees are characterized by a straight, upright, tapering trunk.

Informal upright or *moyogi* trees incorporate visible curves in trunk and branches.

Cascade-style or *kengai* specimens are trees that fall below the base of the pot.

Forest (or group) or *yoseue* style comprises a planting of several or many trees of one species, typically an odd number, in a bonsai pot



Formal upright

Informal upright

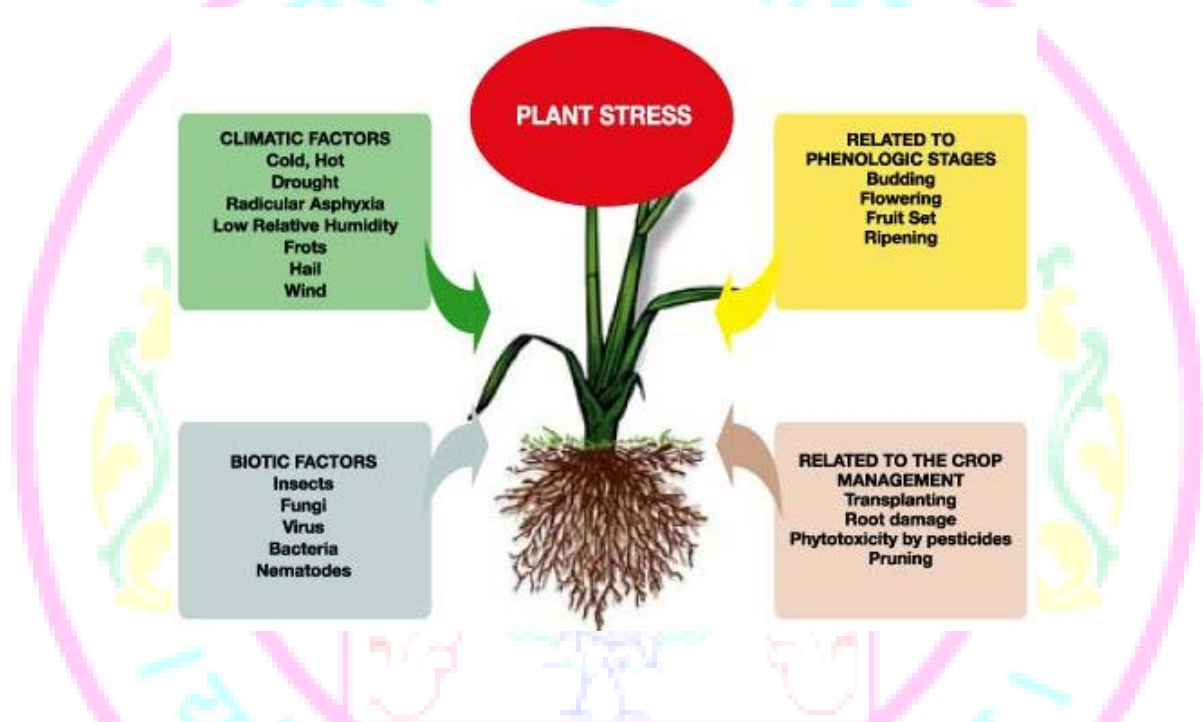
Forest (or group)

Cascade-style

STRESS PHYSIOLOGY

Hitesh A. Solanki

Like all other living organisms, the plants are also frequently subjected to various environmental stresses such as water deficit, drought, cold, heat, salinity and air pollution etc. The study of functioning of plants under these stresses or adverse environmental conditions is called “stress physiology” which is an important branch of environmental or ecological physiology.



*Source: planta_estres_veg_ing.jpg

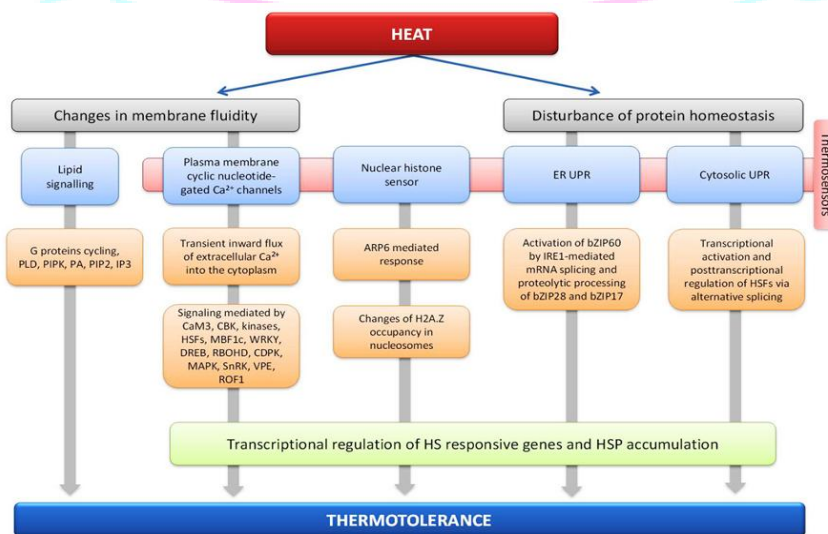
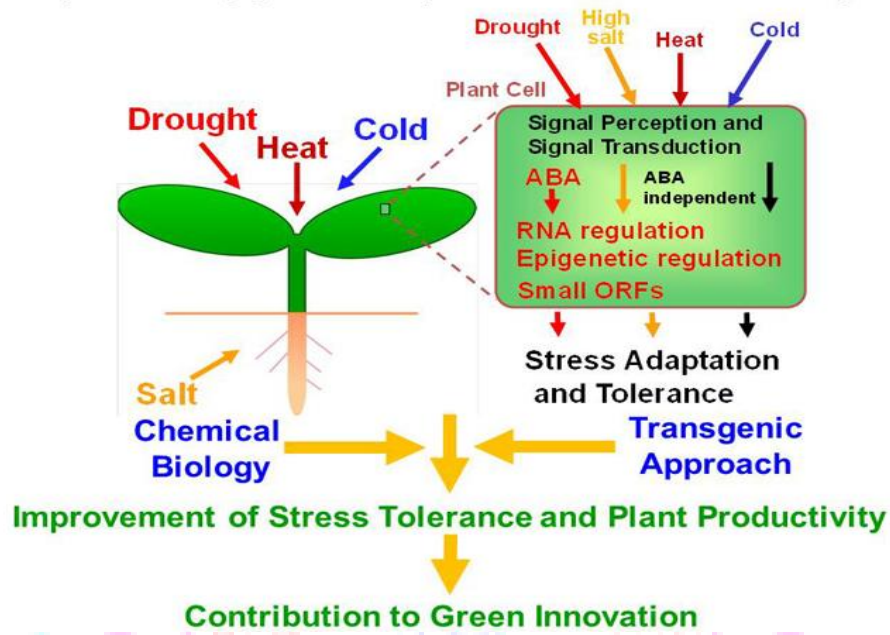
According to Levitt (1972, 80) stress is any “change in environmental conditions that might reduce or adversely change plant’s growth and development.” The concept of stress is intimately associated with stress tolerance i.e. the plant’s ability to cope with adverse environment. Degree of tolerance differs with different plant species. An environmental factor may be stressful to one species and not to the other.

If the tolerance of the plant increases as a result of exposure to prior stress, the plant is said to be hardened or acclimated. Gene expression might play an important role in acclimation. However, acclimation differs from adaptation.

The latter usually refers to ‘genetically determined level of resistance acquired by the plant through a process of selection over several generations’.

Tolerance differs from avoidance. In avoidance, the plant responds by somehow reducing the impact of environmental stress. For instance a plant growing in desert might avoid dry soil by penetrating its root deep to the water table, while in tolerance the plant just tolerates or endures the adverse condition. Adverse soil and other climatic conditions (stresses) may reduce the yield of crops appreciably and affect the distribution of plants. Therefore, stress physiology is of great importance to ecologists and agriculturists.

Transcriptome and Epigenome Analyses in Plant Abiotic Stress Adaptation



ANTHROPOGENIC ACTIVITIES AND ENVIRONMENTAL N-CYCLE

Megha Saleel Bhatt

Earth as a planet shows presence of varied biodiversities in context to flora as well as fauna because of its varied regional climate. The average of all these regions makes up Earth's global climate. Earth's history shows cooling and warming of climate for various reasons. The scientific consensus is that climate is warming up and as a result greenhouse gases which are increasing dramatically in the atmosphere because of human activities.

Carbon (C) and reactive nitrogen (Nr) are two elements increasing in the Biosphere due to human activity. This is mainly due to emissions from Use of fossil fuel, Land use, Land-use change (particularly in agriculture) which leads to increased levels of CO_2 , NO_x and CH_4 . And this disturbs the natural biogeochemical cycling of these two elements. The human impact on the carbon cycle is still relatively small compared to our contribution to nitrogen cycling where the anthropogenic input may be larger than the natural background.

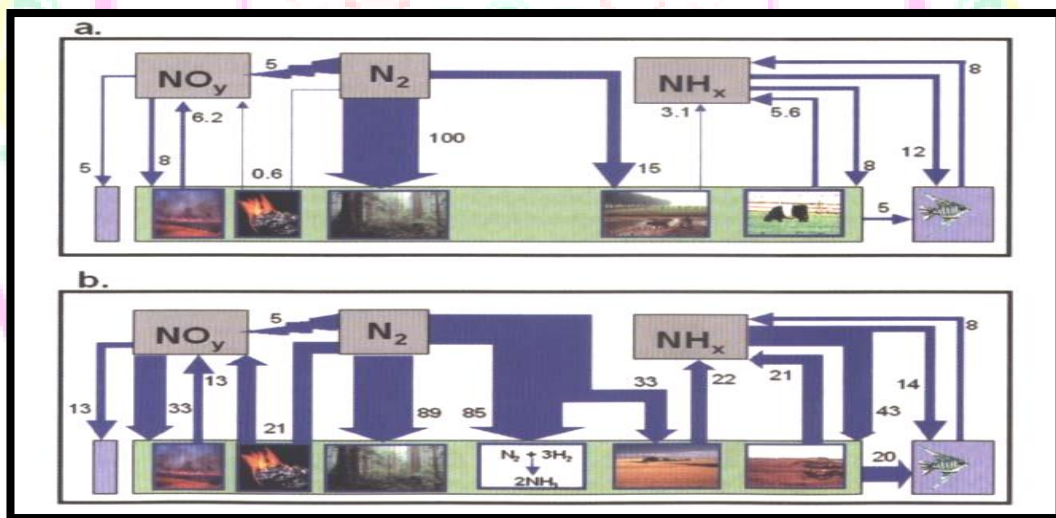


Figure 1: Galloway et al., 2000 showing Global N Budget Year (a) Year : 1890 and (b) Year : 1990, Tg N Yr⁻¹ where different forms of N moving in the form of fluxes. Hundred years budget shows thickening of arrows showing increase in fluxes due to human activities.

The influx of N at any given time has more than doubled since the 1940s because of massive increase in the use of fertilizer. The increase in population world over forced mankind to increase agriculture productivity at that point of time. Not only in the world but there is a 165 fold increase in total consumption of inorganic nitrogenous fertilizer to Indian agro-ecosystem during 1951-52 to

1995-96. N loading due to this fertilizer use is the global major issue today. Figure 2 shows the scenario in India. Total production N fertiliser in India increased tremendously by 375 times. The total N consumption Of N fertilizer shows increase of ~165 and 200 times.

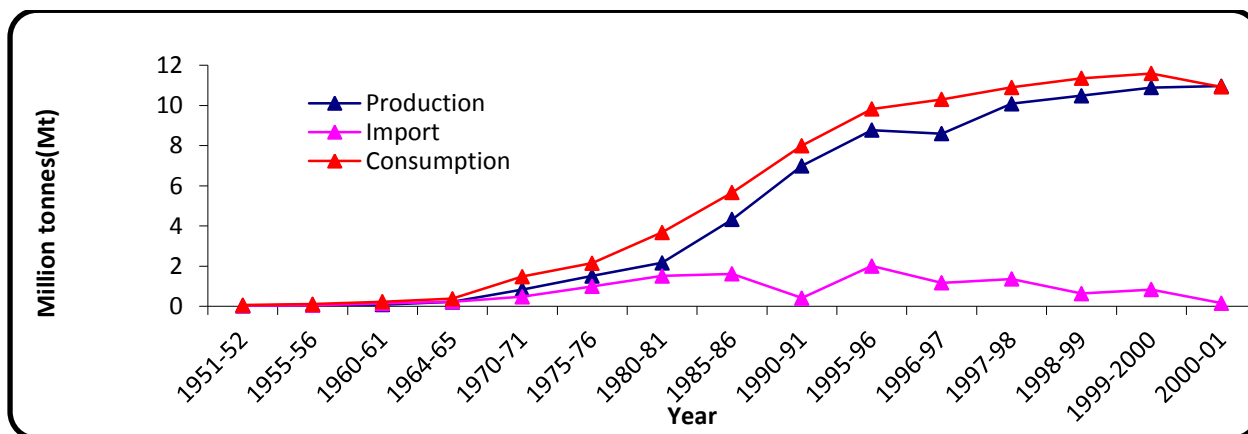


Figure 2: Production, Import and Consumption of N fertilizers in India (1951-52 to 1999-2000) Not only in the agriculture sector but N loading is a major issue in other ecosystems too. Nitrogen from fertilizers sinks into soils and leads to process of eutrophication. Which causes aquatic weeds to grow unchecked. Algal blooms can cause a water body to lose its species diversity. Process of eutrophication leads these water bodies oxygen deficient leading to biodiversity loss i.e., When the N-rich waters make their way downstream to the ocean forms dead Zones.

The N input on agricultural land in the form of wet deposition alone is almost 45% of total nitrate nitrogen deposited in India; the estimated biological nitrogen fixation by legumes cultivated in the agro ecosystems of India has increased by 114.55 % in last fifty years. It's supposedly contributing more to the global supply of fixed nitrogen each year than natural processes do, with human generated nitrogen totaling about 210 million metric tons per year, while natural processes contribute about 140 million metric tons. These activities also releases solid forms of N which is more potent than carbon dioxide which creates an enhanced green house effect, increasing global temperatures ultimately leading to global warming. These environmental changes will surely affect flora, soil fauna and microbes which mediate the turnover times of these nutrients creating drastic changes in pools and fluxes of the same and unknowingly or knowingly disruption in the environment which we now call Climate change.

CUT FLOWER

Ruby Patel

A Cut Flower can simply be defined as any flower that is cut from the plant, thorns trimmed, and are ready to be used in a fresh flower arrangement. Cut Flowers are available at the florist or can be cut from the home garden.

Most Cut Flowers are popular choices as gifts on special occasions, either as a single cut flower or as a bunch or a bouquet of cut flowers. Appeal and beauty of flower, Sweet fragrance, and long stemmed Flower, Extended vase life of Flower make a good cut flower. Resistance to disease and pests, Resistance to heat and droughts, relatively easy to harvest and handle make cut flower trade profitable for cut flower growers and traders.

Rose is the most important cut flower. *Carnation, Gerberas, Chrysanthemums*, also enjoy a huge demand in cut flower market. *Tulip, Gladioli, Lilies, Alstroemerias, Anthurium etc.*, are also popular with the flower lovers.

To keep cut flowers beautiful longer; as they have been removed from their source of water, the root system, and will wilt quickly if not placed in water. Cut stems should be placed in water immediately, as air will rapidly move into the water-conducting tissues and plug the cells. Cuts can be made under-water to assure no air enters the stem.

Commercial preservatives will increase the life of cut flowers and should always be used. A floral preservative is a complex mixture of sucrose; acidifier, an inhibitor of microorganisms; and a respiratory inhibitor. Sucrose serves as a source of energy to make up for the loss of the functioning leaves and insures continued development and longevity of the flower.

An acidifier makes the pH of the water more near the acid pH of the cell sap. Most water supplies are alkaline and can reduce the life of cut flowers. The acidifier also stabilizes the pigment and the color of the flower. This is why red roses turn "blue" when placed in water without a preservative or acidifier. A microorganism growth inhibitor is perhaps the most important part of a floral preservative. Bacteria and fungi are everywhere and are ready to enter the cut surface of the stem and multiply. Prior to actual decay symptoms, cells of the water-transporting tissues can become blocked with microorganisms, inhibiting water uptake.

Tips for long lasting cut flower.

- Recut the stems and remove excess foliage.
- Harden the flowers by setting them in warm water in a cool place.
- Use a floral preservative.
- Keep them cool and avoid drafts, hot spots, and television sets.
- Use a clean vase or container and check the water level daily.



PHYTOREMEDIATION

Kuntal Shah

Phytoremediation is the process using plants to clean up the environment. The word phytoremediation comes from the greek word 'phyto', meaning "plant" and the latin word 'remediare', meaning "to remedy". This word is generally used to describe any system where plants are introduced into an environment to remove contaminants from it.

Phytoremediation is done in a variety of ways. Phytoremediation is the use of plants to reduce environmental risks due to contaminants in soil, sediment, surface water, and ground water. The plants may remove, transfer, stabilize, or destroy contaminants depending on the nature of the plants and contaminants. Phytoremediation is an environmentally friendly, safe, cheap way to clean up contaminants. Early estimates on the costs have shown that plants could do that same job as a group of engineers for one tenth of the cost. The plants are also more pleasing to look at than many such operations are. The soil or water need not be gathered in and stored as hazardous waste, requiring large amounts of land, money, and manpower. Plants can be planted, watered, and then harvested with less manpower. If need be, the storage of the harvested plants as hazardous waste would be a far smaller amount.

Phytoremediation may be used for a wide variety of sites, if the circumstances are right. Types of sites where phytoremediation may be applied include pipeline sites, fuel storage tank farms, gas stations; industrial and municipal landfills; agricultural fields; wood treating sites; dry cleaning sites; military installations; army ammunition plants; sewage treatment plants; and mining sites. Contaminants that have been remediated in laboratory and/or field studies using phytoremediation or plant assisted bioremediation include Heavy metals (Cd, Cr(VI), Pb, Co, Cu, Ni, Se, Zn), Radionuclides (Cs, Sr, Ur), Chlorinated solvents (TCE, PCE), Petroleum hydrocarbons (BTEX), Polychlorinated biphenyls (PCBs), Polynuclear aromatic hydrocarbons (PAHs), Chlorinated pesticides Organophosphate insecticides (e.g., parathion), Explosives (TNT, DNT, TNB, RDX, HMX), Nutrients (nitrate, ammonium, phosphate) Surfactants etc.

DO PLANTS GET SUNBURN?

Urvi Gupta

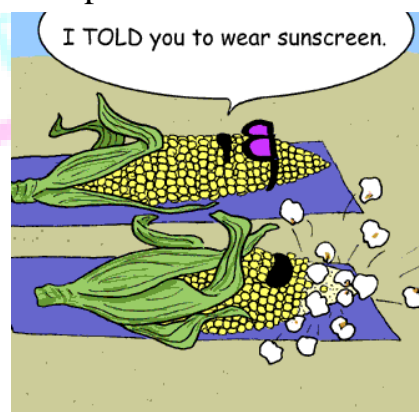
They are the most important part of our lives and main source of our livelihood and for this they bask in the sun for hours and hours. They are plants. They spend their whole day sunbathing. Though they need sunlight for photosynthesis, but what about overexposure to the sun's rays for long time? Don't they get sunburn? This over exposure can lead to serious damage to their DNA that can interrupt their growth. So how do they protect their succulent leaves, shoots and flowers from burning to a brittle? A new study has revealed that plants manufacture a natural "sunscreen".



This plant sunscreen is not like the same which we use to protect ourselves from the sun. It is a combination of special molecules. These molecules are called sinapate esters. These molecules are produced by plants and supplied towards outer layer of their leaves to form an invisible barrier which protect plants from UV radiation.

A group of researchers from Purdue University in US have discovered that these group of molecules block UVB radiation when plants absorbs light for photosynthesis. The team identified the different wavelengths of light and a type of sinapate ester called sinapoyl malate blocks. They converted the sinapoyl malate from a liquid to gas and then try to destroy it with UVB radiation from a laser. Surprisingly they found that the compound was able to soak up radiation at every wavelength across the UVB spectrum.

The team says that the finding might be helpful for making plants that are even more resistant to UVB in the case of heat waves which are becoming more and more common with climate change. With such a well-organized mechanism for absorbing harmful radiation, it's not surprising that unlike us, plants only need a thin coating of sunscreen to protect them from sunburn.



FLAXSEEDS: A RICH SOURCE OF OMEGA 3-FATTY ACIDS

Shirin Qureshi



Flax seed or Linseed (*Linum usitatissimum L.*) comes from the flax plant, an annual herb. In the past, flax seeds were used mostly as a laxative because of high fibre content. Now, it is also used as a source of omega 3- fatty acids and it has lignans showing high antioxidant qualities.

What are Omega 3 – fatty acids?

Omega 3- fatty acids are polyunsaturated fatty acids (PUFAs) with a double bond (C=C) at the third carbon atom from the end of the carbon chain. The fatty acids have two ends, the carboxylic acid (-COOH) end, which is considered the beginning of the chain, thus "alpha", and the methyl (CH₃) end, which is considered the "tail" of the chain, thus "omega." The nomenclature of the fatty acid is taken from the location of the first double bond, counted from the methyl end, that is, the omega (ω-) or the n- end. Flaxseeds are rich in alpha-linolenic acid (ALA), an omega-3 fatty acid that is helpful for heart disease, inflammatory bowel disease, arthritis and other health problems. Recent studies have shown that omega 3- fatty acids found in flaxseeds called ALA inhibited tumour incidence and growth.

Flaxseed is one of the richest plant sources of lignans, providing up to 800 times more lignans than most other foods. Lignans are phytoestrogens – compounds that have been shown in studies of animals and in early human clinical trials to help protect against certain kinds of cancer, particularly cancers of the breast and colon, by blocking tumour formation.

Flaxseeds help improve the immunity and also in curing diabetes. Flaxseed has been shown to lower fasting blood glucose and glycated haemoglobin (HbA1c) and thus may be helpful in the management of diabetes mellitus. In overweight or obese individuals with pre diabetes, flaxseed intake decreased glucose and insulin levels and improved insulin use.

How much flax to eat?

Healthy people should consume 5-10g (1-2 tsp) of flaxseed oil or 8-16g (1-2 Tbsp.) of milled flaxseed as part of a balanced diet.

However, for individuals at risk of developing, or who have heart disease, a daily intake of 40g (5 Tbsp.) of milled flaxseed is recommended by Health Canada.



Linum usitatissimum

DEAREST WINTER VEGGIE : CARROT

Ancy J. Fernandes

Carrots are the attractive and desirable storage roots. They have a crunchy texture and a sweet and minty aromatic taste. The name carrot comes from the Greek word ‘karoton’ where the first three letters “kar” are used to designate anything with a horn like shape. Carrots are of various colors like orange, white, yellow, red, or purple.

Scientific name: *Daucus carota*

Family: Apiaceae

Relatives of Carrot: Parsnips, Fennel, Parsley, Anise, Caraway, Cumin and Dill. Carrot has been cultivated in central Asian and Middle Eastern countries alongwith parts of Europe. In today’s Commercial marketplace China produces one third of all carrots bought and sold all over the world.



All Carrot varieties rank high on list of all commonly consumed U. S. antioxidant vegetables because of their β - Carotene content. The recent research on carrot has been carried out on a category of phytonutrient called polyacetylene. All varieties of carrots contain valuable amounts of antioxidant nutrients.

Carotenoids-	Hydroxycinnamic acids-	Anthocyanindins-
<ul style="list-style-type: none"> • α-carotene • β- Carotene • lutein 	<ul style="list-style-type: none"> • Caffeic acid • Coumaric acid • Ferulic acid 	<ul style="list-style-type: none"> • Cyanindins • Malvidins

Carotenes are converted into vitamin A in the liver. β - carotene is the major carotene that is present in these roots. Beta carotene is one of the powerful natural anti-oxidant that helps protect body from harmful oxygen-free radical injury.

Fresh Carrots also contain Vitamin C, B-complex groups of vitamins such as folic acid, vitamin B-6 (pyridoxine), thiamin, pantothenic acid, etc., that acts as co-factors to enzymes during substrate metabolism in the body also with some

healthy levels of minerals like copper, calcium, potassium, manganese and phosphorus.

To store carrots for a long time one should keep them away from apples, pears, potatoes and such fruits and vegetables that produce ethylene gas as it can make its taste bitter. For β - Carotene to be bioavailable it should be steam cooked.

Benefits	Side effects
<ol style="list-style-type: none"> 1. Glowing skin. 2. Revitalize and tone skin. 3. Get rid of blemishes and scars. 4. Promote hair growth and add thickness. 5. Combating hair loss . 6. Prevent hair graying. 7. Prevent wrinkles. 8. Protect skin against Sun's harsh rays. 9. Keeps skin hydrated. 10.Protects eyes. 11.Boost immunity. 12.Protects the dental health. 13.Cleanses body. 14.Prevents Stroke. 15.Good bowel movement. 16.Regulates blood sugars. 17.Prevents Cancerous cells growth. 18.Has anti-inflammatory and anti-fungal properties. 	<p>An overdose of Carrot in the diet causes:</p> <ol style="list-style-type: none"> 1. Carotoderma (Skin Yellowing). 2. Bloating. 3. Stomach Cramps. 4. Intestinal Discomfort. 5. Excess fibers in carrot can cause deficiency of important fat soluble Vitamin's absorption by the body. 6. Interacts with drugs. 7. Interacts with dietary supplements.

Enjoy the all time favourite wonder veggie every season, as the mouth watering halwa or as salads or just steam cook it but do make an attempt to taste the fabulous flavor of some important and quintessential compounds for a healthy life

IF MUSIC AFFECTS HUMAN MINDS, CAN IT AFFECT PLANTS ALSO?

Deepti Sharma



In today's hectic schedule all of us want to relax in some ways. So to keep ourselves happy and relax the best god gifted medicine is Music. Now the very interesting question arises is that Is it possible that music can affect plants also???

And the answer comes yes!!!!!!

That's very true that if we apply music to the plants then it actually affecting its growth in a drastic way. Plants which are treated with soft melodious music were much healthier as compare to the other plants. Even the flowering comes earlier in musical plants. Music not only affects its growth but also affecting biochemically. Several metabolites of plants also increased in concentration.

So if music really affecting the plant growth then this concept can be very beneficial for the future aspects. Farmers can utilize the concept of music therapy to yield a higher and better quality of crops. In nursery also, music can be applied to speed up the seed germination and make the plants healthier. Even in home also music helps in indoor plants growth.



FRUITS FOR ANTIOXIDANTS

Nikisha Purohit

Fruits are one of the oldest forms of food known to people. Fruit is a part of flowering plant that derives from specific tissues of the flower, one or more ovaries, and in some cases accessory tissues. Many of them that bear cultivated fruits in particular have propagated with the movements of humans and animals in a symbiotic relationship as a means for seed dispersal and nutrition

Outer area: There are some differences between wild fruits and cultivated fruits: Wild fruits have thicker peels and bigger seeds, strings, rinds, cores and other bits. Cultivated fruits are seedless, easy to bite, easy to peel, and abundant in edible flesh. Because of their more roughage outer area wild fruits can be more of a challenge to eat.

Amount of water: Wild fruits are often calorically denser. In other case cultivated fruits have lower water content. Humans seem fond of fruits because of their juicy and crunchy content. Wild fruits are sometimes dry crumbly crunchy mushy and otherwise non juicy. The higher water content of cultivated fruits is lower in protein and fat than wild varieties.

Nutrition substances: some wild fruits are more nutritious than the cultivated fruits that we found. Compared to conventionally grown ones, the wild fruits are far more nutritious. Throwing wild fruits into our shopping carts leads to the fluctuations of vitamin and mineral content as much as flavour.



Wild fruits



Cultivated fruits

Natural substances which become dangerous: From toxicity perspective, most cultivated fruits are easy and safe, whereas wild fruits especially under ripe ones can contain a number of natural toxins. These toxins cause everything from an upset stomach to death, alkaloids, tannins, cyanogenic glycoside and a variety of other compounds can exist in some types of wild fruit, making it necessary to know which parts are safe to eat.

Antioxidant: An **Antioxidant** is a molecule that inhibits the oxidation of other molecules. Oxidation is a chemical reaction that transfers electrons or hydrogen from a substance to an oxidizing agent. Oxidation reactions can produce free radicals. In turn, these radicals can start chain reactions. When the chain reaction occurs in a cell, it can cause damage or death to the cell. Antioxidants terminate these chain reactions by removing free radical intermediates, and inhibit other oxidation reactions. They do this by being oxidized themselves, so antioxidants are often reducing agents such as thiols, ascorbic acid, or polyphenols.

Antioxidant is divided into two types' primary metabolites and secondary metabolites. There are number of clinical studies suggesting that the antioxidants in fruits, vegetables, and red wine are the main factors for the observed efficacy of these foods in reducing the incidence of chronic diseases including heart disease and some cancers. Various antioxidant activity methods have been used to compare the antioxidant activity of fruits. Some cultivated fruits like Pomegranate contain polyphenols, such as ellagitannins and flavonoids, Tomato contains lycopene, Guava contains carotenoids and polyphenols like (+)-galocatechin, guajaverin, leucocyanidin and amritoside. Some wild fruits which are in progress to found antioxidant value in it.

CLIMATE CHANGE, CLIMATE JUSTICE, HUMAN RIGHTS AND INDIA

Rohan Thakker

Climate Change is a global issue associated with Human rights. The ice melting, the extreme events, sea level rising, and loss of land has become a headache for the world. India is surrounded by nations which are really vulnerable to the issue of climate change. In the west i.e. Pakistan, the Indus has started showing the signs of Course Change back to India which is the major source of water in Pakistan. In the north i.e. Nepal, the Himalayan glaciers have started melting on a faster rate, and hence extreme events are increasing day by day in the Himalayan region. In the east i.e. Bangladesh, the entire nation is situated in the delta of Ganges & Brahmaputra, which is now facing a serious problem due to sea level rise. Lohachara Island in Bay of Bengal has already submerged in to the sea due to sea level rise. Frequent Crop failures and increase in salinity has become a major issue in Bangladesh now. In the south Maldives and Srilanka are also on threat due to sea level rise and salinity ingress; not only on land but also in fresh water sources. People who are poor are more Vulnerable to Climate Change & its effects have already started migrating to India and other countries for food, shelter and other basic necessities. It has been seen in the case of Lohachara Island that, People from Lohachara fought with the people of Suparibhanga Island & Ghoramara Ghoramara Island in Bay of Bengal to get land to stay as the island submerged into the sea. So it will become a serious issue of illegal migrants or Climate refugees in India in the near future from all the directions i.e. Nepal, Bangladesh, Pakistan, Maldives & Srilanka! It is a possibility that Indian sub-continent may face frequent riots due to this possible social imbalance. Instead of “Polluter pays principle” there should be “Polluter Repairs principle”. The developed nations pollute and the underdeveloped and developing suffer. The rich pollute and the poor suffer. Annex-1 nations i.e. the developed nations should repair and pay for what they have done. India should have a definite policy of identifying Climate refugees in India as well as in international law as there might arise a conflict of illegal migrants and climate refugees here. The issue of Climate Change should also be thought in terms of Human rights perspective as it affects fundamentals of human rights i.e. right to life, security, subsistence, food & health. In failing to tackle climate change with urgency, rich countries are effectively violating the human rights of millions of the world’s poorest people.



LESSONS FROM NATURE

Dr. Archana Mankad

When nature displays its magnanimity, its grandeur it makes us awestruck. The huge mountains, the grand waterfalls, the mighty oceans, the terrible cyclones, the tornadoes, the beautiful exciting sunrise and the silent colourful sunset, the oldest tree, the largest flower, the largest fruit, the most amazing animals and the never tiring microbes.. Nature is indeed Magnanimous. Yet it keeps changing. It keeps teaching us wonderful lessons all along.

Our teachers have also been truly magnanimous in their own might. They have taught us more than lessons in the book. What we are today is thanks to their tireless efforts to help us achieve our aims. It is really an achievement to be a Friend, Philosopher and a Guide to the students. It is really an achievement to sustain the spirit of teaching and learning, research and development inspite of all odds. It is really an achievement to be respected so lovingly by the whole fraternity..Infact it is truly a LIFETIME ACHIEVEMENT.

We appreciate the efforts of our teachers and are together in conveying our regards ..in the form of a small token..GOLDEN PETAL AWARD FOR LIFETIME ACHIEVEMENT TO OUR LOVING TEACHERS.



GLIMPSES OF ACTIVITIES OF GUJARAT UNIVERSITY BOTANICAL SOCIETY GUBS JUNE 2014 - NOVEMBER 2014

The activities of **Gujarat University Botanical Society (GUBS)** for 2014-2015 were formally inaugurated by Prof.N.K.Shah, Dean - Faculty of Science and Chief Guest for the function, on 9th August-2014. The new **TEAM GUBS**, under the guidance and support of Dr. Himanshu Pandya, Staff- in- charge, GUBS for the year 2014-15, would coordinate various curricular, co-curricular and extra-curricular activities. Dr. Archana Mankad, Head, Department and Patron-GUBS welcomed the Chief Guest, Prof. N. K. Shah and provided a bird's eye view of the activities scheduled for the coming year. Prof N. K. Shah inspired the students with her words of wisdom. The new Team was coroneted with Badges by Dr. N.K.Shah .The inaugural function was accompanied with icebreaking and a formal welcome of the new students in Botany, Bioinformatics and Climate Change Impacts Management courses.



The students and staff from the department visited GEER Foundation and BISAG. The students were accompanied by Dr. Megha Bhatt and Dr.Archana Mankad. The group was welcomed by Mr. Alap Pandit and then they visited the Dinosaur park, Medicinal Garden, Cactus house, Botanical Garden and finally interacted with the officials of the GEER Foundation. The visit to BISAG was unique with a wonderful presentation on the diverse applications of remote sensing and the visit to the studios of SATCOM. Here the group got an opportunity to witness an educational programme being recorded and the technological advancements related to shooting and editing the programme.



The semester III students participated in the Theme based **Nature Education Camp** organized by GEER Foundation, Gandhinagar during 4-6th September, 2014. The M.Sc. Sem III Botany and Zoology students from University School of Science, Gujarat University had been for a Nature Education Camp at Aranya Udhayan in Gandhinagar for three days camp on “Biodiversity and its Conservation” from 4th -6th September, 2014. Shri Bharat Pathak, Director GEER Foundation organized the camp and his dedicated team of officials made the whole experience truly learning experience. Students of the Department of Botany were accompanied by research scholars. Besides interacting with Dr. Ketan Tatu, Mr. Alap Pandit and Dr. Harshad Salvi, Scientists at GEER foundation, the camp provided hands on experience of observing Biodiversity and learning essentials of its conservation. Trekking through a forest trail, understanding the significance of sampling and need of generating a census made the experience very exciting. The Botany and Zoology students were involved in a combined exercise of studying the flora and fauna of a given area and compiling the observations as data sheets. There were exclusive sessions to practice the use of GPS in the forest area in a very novel way. The participants were made to play a treasure hunt with scientific-biological clues to be used with the GPS and finally discover the “treasure”. This allowed for learning in a play way manner and was appreciated by all. The participants also learnt the use of Clinometer to study the tree height. Shri Bharat Pathak, Director GEER Foundation and Dr.A.P.Singh, Member Secretary, Gujarat Biodiversity Board, took keen interest in the proceedings of the camp and spent quality time with the participants besides addressing and generating interest in key issues pertaining to conservation of Biodiversity. A visit to the Botanical garden and the research labs at GEER foundation was also planned to sum up the camp activities.



DEPARTMENT OF BOTANY AND WOMEN DEVELOPMENT CELL

A workshop on **Self Defense Solutions 2014 (SDS 2014)** was organized by Gujarat University Botanicals Society (GUBS) and Women Development Cell (WDC) on Friday 22nd August 2014. Mr. Pruthvi Bhatt, Founder President of the Lok Raksha Sewa Samiti & Woman's Defence Committee and also editor of Lok Rakshak Police Patrika, a weekly news paper, was invited to be the resource person.

Welcoming Mr. Bhatt, Prof. Savita Gandhi, Chair person-WDC stressed on the significance of the workshop and conveyed heartfelt gratitude to Mr. Bhatt and his team of trainers for having spared their valuable time in the interest of the participants of the workshop. Prof. Savita Gandhi conveyed her best wishes to the participants and hoped that it would pave the way to better confidence among the participants. Mr. Bhatt very appropriately encouraged the participants to interact, express and display their fears and ultimately helped them overcome the same. Mr. Bhatt very rightly suggested that being able to fight for own safety is the need of the hour. His team of trainers not only demonstrated the ways to prevent an attack but also provided an opportunity to the participants to get a hands-on-training in the same. The girls felt much more confident and promised to practice and spread the message of learning self defence. The boys were sensitized towards the urgent need to be fit, agile, be aware of their surroundings and all the same be ever ready to help anyone in need of help. Dr.Himanshu Pandya, Staff-in-Charge, GUBS, coordinated the event along with Dr.Archana Mankad, Member Secretary-WDC. All participants received certificates of participation. The participants appreciated the workshop and have expressed willingness of learning martial arts in an

advanced workshop later in this month. In fact, this workshop was conceptualised earlier this year in March during a seminar on Safety And Security for All 2014 (SASA 2014) organised by GUBS and WDC with Ms.Ruzan Khambhatta. The staff and students from various PG departments benefitted from the workshop. The event was anchored by Dr.Megha Bhatt very gracefully.

Workshop on Self Defense Solutions 2014 (SDS 2014)



Inauguration of the Workshop



Prof.Savita Gandhi: Welcome Speech



Mr.Prithvi Bhatt – Resource person



Training in progress



Training in progress



Training in progress



Training in progress



Training in progress



Dr.Megha Bhatt-anchoring the event



Ms.Charvi Pandya-Vote of Thanks

The Department of Botany organized The **National seminar on Strategies to Understand Sustainable Utilization of Plant Wealth 2014 (SUSUP 2014)** during 29-30th September 2014. The event began with the inaugural function. Our Honourable Vice Chancellor, Dr.M.N.Patel was the President of the function and the chief guest Shri Bharat Pathak , Director GEER Foundation along with the Guest of Honour Dr.H.C.Patel, Registrar, Gujarat University were dignitaries on the dais. Addressing the august gathering, Dr. Archana Mankad highlighted the objective of the seminar. The world is on the threshold of a major revolution related to advances in plant sciences. The desire to be a step ahead will always cast its shadow on our most precious natural wealth. Every Plant is important and so obviously it gets utilized in one way or the other. The point of concern for all of us is its sustainable utilization..The challenge is to balance the demand and supply of this extremely valuable natural wealth. Alternate technologies for better production with low inputs,

value addition of phytoresources for adequate commercial exploitation, managing environmental issues and evaluating viable biotransformations would be key issues in this seminar. In the two days of brain storming during the National Seminar, Dr. Mankad stressed to all present to identify tasks ahead and evolve technically to develop customized plants with improved productivity, capability to absorb the pollutants and ability to cure us from deadly diseases but in a sustainable way, because we have not inherited this plant wealth from our ancestors but have borrowed it from our children. Dr.M.N.Patel, Hon.Vice Chancellor blessed the gathering with his precious words of wisdom. Shri Bharat Pathak highlighted the need of such academic deliberations specially in the present context of globalization and climate change. Dr.H.C.Patel, Registrar blessed the participants and expressed his point of view in a novel way. The vote of thanks had a surprise when Dr.Archana Mankad announced the Golden Petal Award for Life time Achievement to Prof.A.B.Vora, Prof.O.P.Saxena, Prof.A.V.Vyas and Prof.Y.T.Jasrai. A quick group photograph with the guests was followed by high tea with piping hot methigotas and tea-coffee. The Theme wise invited lectures were informative and thought provoking. Dr. Pradeep Srivastava from CDRI, Lucknow known the world over for his unique Sciencetoons delivered a very interesting presentation and yet conveyed a very serious message of taking urgent steps to prevent loss of Biodiversity. Dr. Jitendra Pandey from BHU, Varanasi expressed his views on climate change and its impact on Plant wealth. Dr. Rajendra Shinde from St.Xavier's Mumbai justified on the need to explore, study and document biodiversity for further research and value addition. Dr. Rakesh Rawal from GCRI, Ahmedabad explained the utilization of newer technologies like bioinformatics and biotechnology in drug designing for better health.

The participants also got a chance to win luck draw prizes at the end of each session. Lunch was lavish with a variety of mouth watering delicacies and everyone had a very fulfilling experience. After the evening tea, the students from the department had organized a cultural evening with songs, dances, skit, fashion show and the most appropriate garba for the delegates. The climax of the event was whole hearted participation of all the delegates in the garba. Cholepuri and Gulabjamun for dinner was a welcome menu and everyone indulged in it and enjoyed.

The next day was competition day for the participants when young scientists were to be identified. There were oral and poster presentations for the research

scholars and faculty. The Judges decided the best among the group and the winners received the Young Scientist awards. All Postgraduate and Undergraduate students presented posters and competed for the Budding Researcher award. This was the last session so a quick vote of thanks was followed by certificate distribution and Lunch. After lunch the delegates visited Akshardham at Gandhinagar. The laser show is one of its kind and everyone enjoyed it thoroughly. Dinner was served at Akshardham and everyone relished hot Acharya Khichadi with puribhaji.

In all, the seminar was well planned and the events went on as per schedule. Academic deliberations encouraged young minds to ponder over the challenges faced by the generation next and explore the solutions for the same. Development always takes a toll of natural resources. The point is how much damage would be sustainable for the mother earth. The event was well supported by the Gujarat University, GUJCOST and BISAG.



Inauguration



Welcome to Vice-Chancellor



University Song



Floral welcome



Welcome Speech



Group Discussion



Group Photo



Food Court



Prayer Song



Cultural Programme



Cultural Programme



Cultural Programme



Poster Presentation



Oral Presentation



Prize Distribution



Prize Distribution



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