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ANKUR

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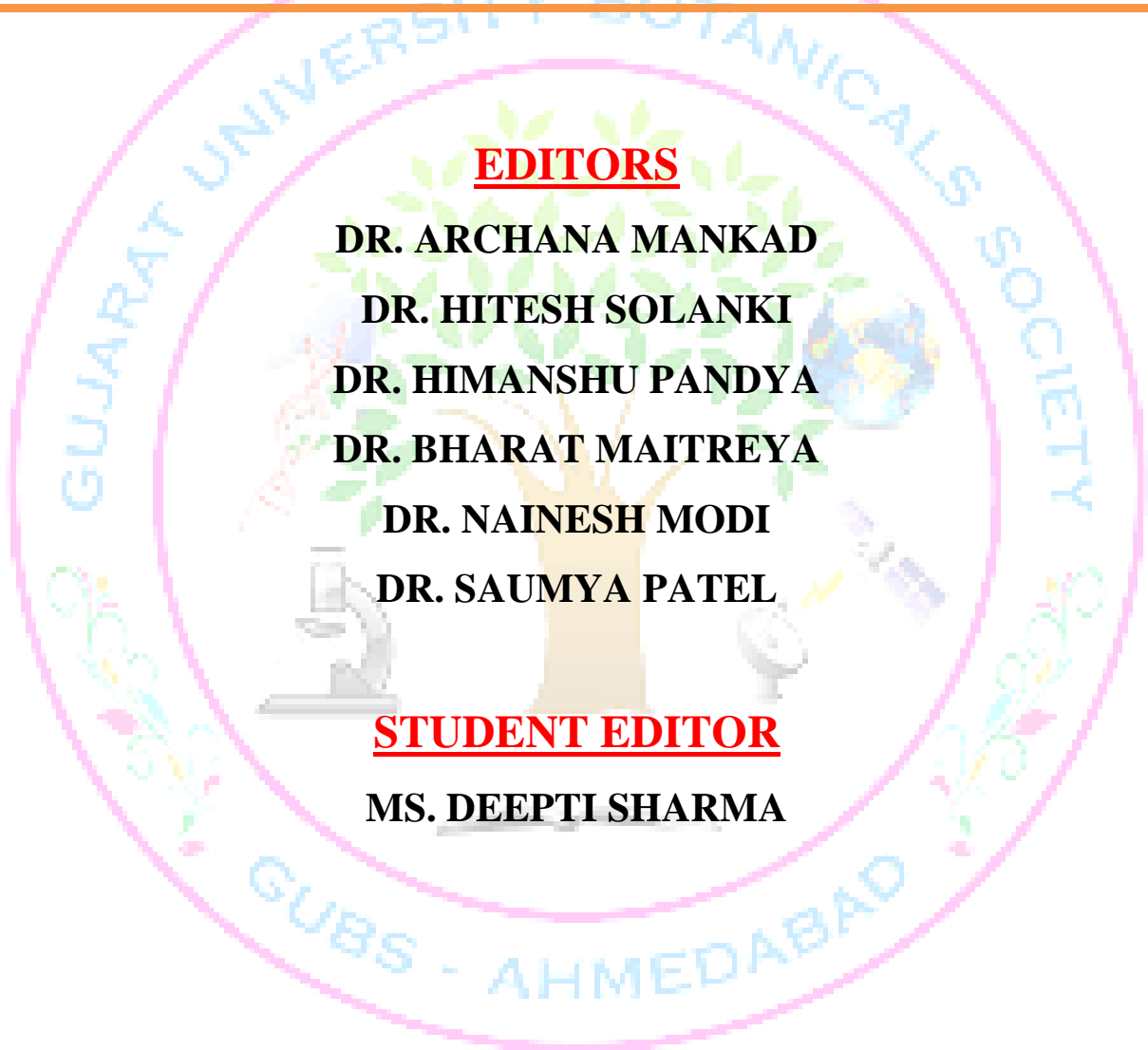
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ANKUR

.....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 five years old. This newsletter is intended to be published twice in a year. The growth and development of Ankur is a reflection of the growth and progress of the students of the department. This news letter will serve to reinforce and allow increased awareness, improved interaction and integration among all of us.

The journey began four years ago and now Ankur has blossomed and is spreading the fragrance to everyone around with the message that plants can also improve our health. In this issue, we focus on ethnic use of plants in Indian culture.

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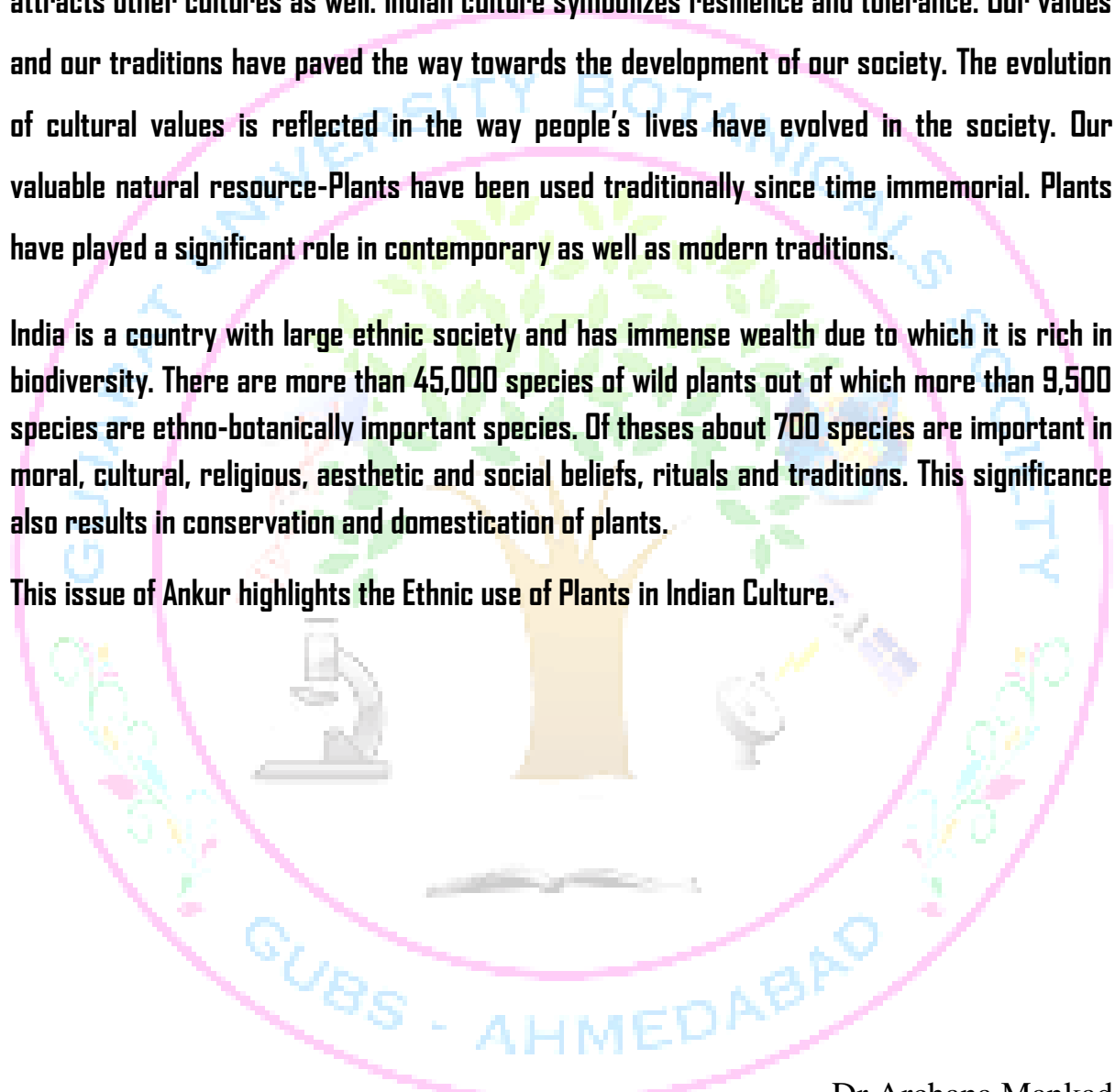


PATRON'S MESSAGE.....

Indian Culture is incredibly rich and illustrates a unique amalgamation of diverse regions, each with a unique identity. Be it food, language, clothing, beliefs, art, craft, religion, festivals, music, dance, Indian culture is woven with regional traditions. It is the Indian ethos that attracts other cultures as well. Indian culture symbolizes resilience and tolerance. Our values and our traditions have paved the way towards the development of our society. The evolution of cultural values is reflected in the way people's lives have evolved in the society. Our valuable natural resource-Plants have been used traditionally since time immemorial. Plants have played a significant role in contemporary as well as modern traditions.

India is a country with large ethnic society and has immense wealth due to which it is rich in biodiversity. There are more than 45,000 species of wild plants out of which more than 9,500 species are ethno-botanically important species. Of these about 700 species are important in moral, cultural, religious, aesthetic and social beliefs, rituals and traditions. This significance also results in conservation and domestication of plants.

This issue of Ankur highlights the Ethnic use of Plants in Indian Culture.



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COCONUT

DR. ARCHANA MANKAD



Cocos nucifera (Coconut) is a sacred plant in Indian Culture. It's also called as Kalpavriksha because almost all parts of this tree are economically useful to mankind. Coconut is celebrated as a symbol of prosperity, a blessing of nature, an auspicious object of ceremony, useful item of handicraft, and an essential ingredient for cooking. The tree grows along all coastal areas all over the world and is believed to have been dispersed by sea. In India it dots the unique landscape of coastal areas like Kerala and plays an important role in the economy of the state. Coconut farming is a great means of sustenance for a majority of rural population across the backwaters of Kerala. Evidently, with about 46% of the total production, Kerala is the largest coconut producing state of India. Kerala –the name is derived by combination of two words: Kera meaning coconut tree and Alam meaning land which means Land of coconut trees, so the state owes its name to this hard shelled fruit. Coconut has a special place in Hindu culture of India. It is believed to be an auspicious fruit and used in many rituals on pious occasion. Coconut is offered to deities in Hindu temples across the globe. Many holy events and celebrations are inaugurated with braking of coconuts and offering the copra as Prasad. Earthen, copper or brass pots with green coconuts and mango leaves are put on both sides of main entrance of temples, households and workplaces on festive days. It is a symbol of prosperity and believed to welcome Lakshmi, the goddess of wealth for Hindus. Even during Indian marriages, coconut has a very significant presence in various rituals. Coconut is a rich source of nutrients and is used as a healer in any illness. Its medicinal benefits are immense.

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Photocourtesy:http://www.123rf.com/stockphoto/coconut_tree.html?sti=mit3q1nashnxmbuqu

TURMERIC

DR. HITESH SOLANKI

Turmeric (*Curcuma longa*) is a rhizomatous herbaceous perennial flowering plant of Ginger family, Zingiberaceae. It is native to the Indian subcontinent and Southeast Asia. In Indian culture, the importance of turmeric goes far beyond medicine. The Hindu religion sees turmeric as auspicious and sacred. There is a wedding day tradition in which a string dyed yellow with turmeric paste, is tied around the bride's neck by her groom. This necklace, known as mangalasutra indicates that the woman is married and capable of running a household. The tradition continues in Hindu communities and has been compared to the western exchange of rings. In parts of southern India, a piece of the turmeric rhizome is worn as an amulet for protection against evil spirits. The use of turmeric dates to 3000B.C. in India. It has medicinal and cosmetic uses. Besides it is also used for colouring and dyeing. The importance given to turmeric in Indian Kitchens and rituals is phenomenal, thanks to the host of health benefits that it offers. Haldi is not just to add taste and colour to food, but it also bears significant religious importance. Indian wedding ceremonies include a special ritual using Haldi. The ceremony gets its name from the application of haldi or turmeric that happens during that ritual. The most important component of the haldi ceremony is the haldi paste that is made by mixing turmeric, sandalwood powder and rose water to form a fragrant mixture that is applied on the body. Elderly ladies in the family apply this paste on the hands, feet, arms, legs and face of the bride and the groom and bless them as they gear up for the big day. The event is replete with lots of music, fun and tasty food before the wedding festivities begin. Haldi application is also believed to protect the bride and the groom from bad omen. Turmeric, according to ancient Hindu texts is said to have purification powers. Application of the paste cleanses the body as it also has strong antiseptic properties to prevent acne and pimples. It also helps slough off dead skin to reveal glowing skin beneath.

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LOTUS

DR. HIMANSHU PANDYA



Nelumbo nucifera (Lotus) is sacred to Hindus. The plant has been used since time immemorial in Indian culture. Hindus revere it with the divinities, Vishnu and Lakshmi often portrayed on a pink lotus. In the representation of Vishnu as padmanabha (lotus navel) a lotus issues from his navel with brahma on it. Goddess Saraswati is portrayed on a white colored lotus. The lotus is a symbol of what is divine or immortality in humanity and is also a symbol of perfection. The Lotus is the attribute of sun and fire gods. It symbolizes the realization of inner potential and purity. It has been used to illustrate the philosophy of being untouched by cultural pollution around because the plant is seen growing in polluted waters and yet its flowers and leaves remain clean. It shows high potential for usage in wastewater treatment by having ability of removing polluting compounds and heavy metals. It can grow in variable water conditions and in low light intensity. Various studies show the successful use of *N. nucifera* to counter water eutrofication. The leaves of floating lotus reduce sunlight reaching the lower part of water bodies. This suppresses the growth of algae in *N. nucifera* aquatic systems and so the oxygen contains is up to 20% higher than in other aquatic plant systems due to intense agricultural practices nitrogen and phosphorus pollution are the major problems in aquatic systems *N. nucifera* is able to assimilate a higher content of phosphorous than aquatic plants currently used for water remediation such as water hyacinth. It also assimilates nitrogen and creates a habit for bacterial growth in the water body. Though rhizofiltration, heavy metals including arsenic, copper, and cadmium can be removed efficiently from water. The results observed showed that 96% copper and 85% cadmium metals were removed after the seven days incubation period. The accumulation of heavy metals does not show morphological symptoms of metals toxicity, however, the rhizome quality for human consumption needs further study.

Lotus has many economic uses as food and medicines in Indian culture. It has been a symbol of beauty and theme for beauty expressions, photography, music and films. Lotus can be easily grown from seeds. The seeds have a hard seed coat which can be cracked open by placing the seeds in water. The seeds normally germinate within 10 days.

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Photocourtesy:

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BANYAN TREE

DEEPTI SHARMA

The banyan tree is one of the most magical trees which is native to India where it grows from low altitudes to 2000 feet, especially in dry regions and it is also found in Myanmar, Thailand, Southeast Asia, Southern China and Malaysia- not only in the way its aerial roots create an astounding structure, but also in the properties that each and every part of the tree holds. It is one of the few elements in nature which is useful in every single aspect. This is the reason that the Banyan tree is the National tree of India.

One of the largest trees named the great Banyan tree can be found in Kolkata, India. It said to be over two hundred and fifty years old. Another such tree can be found in Bangalore and has spread of over two acres. Here's an interesting fact about this tree: Originally from India, this tree received its name from the Banias or Indian traders who sat below the tree shades. Village meetings and other useful gatherings would also take place in its shade, thereby giving it its name.

In Indian culture, the Banyan tree is considered to be sacred called as *vat vriksha* (Bargad) which has got a special mention in Hindu mythology as it is symbolizes the trimurti- lord Brahma, lord Vishnu, lord Shiva and can be seen near a temple or religious center and leaves of the tree is considered to be the resting place of god Krishna. An old custom offers worship to this tree. In fact, it is also believed that Buddha achieved enlightenment while sitting under a Banyan tree. There are various uses of Banyan tree. From medicinal to recreational- there's no part of life in which this tree doesn't aid humanity.

In rural parts of India, many villages and towns have a traffic circle and a community gathering place around a big Banyan tree. At night, many people come to sit, relax and chat around it. Usually, a small deity is placed and worshipped at its foot.

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Ethnic Use of *Vitex negundo* (Nirgundi)

Ancy J. Fernandes

Nirgundi of five leaved Chaste tree is an evergreen medicinal deciduous shrub. *Vitex* is a large aromatic shrub with quadrangular, densely whitish, tomentose branchlets. It is native to India and also found growing in Bangladesh, China, Philippines, Sri Lanka and Japan. It is usually grown as fencing for agriculture lands and houses apart from these as folk medicines, particularly in South and Southeast Asia. The plant has a varied range of uses be it the whole plant or a specific plant part. The Sanskrit name "Nirgundi" means that which protects body from diseases; in English it is named as 5 leaved Chaste tree as it is used to diminish sexual desires.

The plant is used for treating stored garlic against pests and as a cough remedy in the Philippines. It has been known world-wide for its pesticidal and insect repellent properties. In Malaysia, it is used in the traditional herbal medicines for women's health, as well as treatment for regulating menstrual cycle, fibrocystic breast disease and post-partum remedies. The leaves are dried and kept with woolen clothes to repel insects. Leaf smoke is used as mosquito repellent. Roman wives whose husbands were abroad with the legions spread the leaves of *Vitex* on their beds for this purpose. Hence, later it became known as the Chaste (innocent/ faithful) berry tree. Parts of the plants like, leaves, leaf oil, roots, fruits and seeds are used in various therapeutic treatments like, Vata and Kapha, headache, skin affections, wounds, swelling, asthmatic pains and reproductive diseases. The hot poultices of leaves are applied to affected parts on inflammatory swellings of joints from acute rheumatism, gonorrheal epididymitis and orchitis. Pastes of leaves are applied to the forehead during headache. Leaf juice is applied on wounds, ulcers and for removing foetid discharges. Leaf decoction with long pepper (*Piper longum*) is prescribed in catarrhal fever.

These features of the plants are due the presence of certain phytoconstituents be it limited to a specific parts or the whole plant. The leaves are known to be composed of Aucubin, ginside and alkaloids (like orientin, Isoorientin, Nishindine), Glyoflavonoids and Hydrocotylene. Seeds contain in them tritriacontane, n-hentriacontane, n-pentatriacontane, nonacosane, β -sitosterol, phydroxybenzoic acid and 5 oxyisophthalic acid. Essential oils reported in fresh leaves, flowers and dried fruits. In the Ayurvedic terms the plant is known to have Kaphahara, Kapha-Vatahar, Kasa-shvashar, Krimighna, Shothhar, Vatahara, Vishaghna and Vranashodhana. Pharmacological properties of *Vitex* broadly can be said to have analgesic, anti-helminthic, anti-androgenic, anti-asthmatic, anti-catarrhal, anti-inflammatory, anti-microbial, appetizer, carminative, discutient emmenagogue, hepatoprotective, larvicidal and muscle relaxant.

Many folk uses have been known to the human kind since ages but the drawback to the known knowledge is that there have been no herbal drugs has been developed from *Vitex*. The most common diseases have been known to be cured merely by its application externals yet the plant lacks the visibility to the herbal drug developing industries.

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Gorasambli – *Pithecellobium dulce* (Roxb.)

Nikita Sapra

It originated from Mexico, then went to America, Central Asia and then to India. Although, these trees have been seen all along the highways in India, no one knew about its culinary use. It resembles tamarind and is widely called as Manila Tamarind. It is an acrid eatable organic fruit for the most part utilize for cooking, contains high wholesome esteem and various medical advantages for body.

Botanical name: *Pithecellobium dulce* (Roxb.)

Family: Leguminosae

Parts used: Bar, Leaves, Seeds, flowers, pulp

Common names: Gorasambli, Manila tamarind, Monkey pod, Madras thorn, Junglijilebi



Availability of Camachile in India

- In tropical conditions at an elevation below 300 meters, camachiles grow like weeds.
- Manila tamarinds bear fruit from **February** through **March**, but may continue until **May**.

Health Benefits of Manila Tamarind:

1. A concoction of the fruit and astringent bark treat ailments ranging from bronchitis.
2. Diarrhea, hemorrhages, sores, liver problems and spleen issues.
3. In Eastern Nepal, parts of the camachile treat **fever**, the **stem** combats **dysentery**, and the **leaves** help with **intestinal disorders**.
4. According to the book, "Huastec Mayan Ethnobotany," the Huastec Indians of Mexico's San Luis Potosi used parts of the tree to manage toothaches, sore gums and mouth ulcers.
5. An extract of leaves is used for gall bladder ailments and to prevent miscarriage.
6. It provides relief from pain, eczema, fever, cold, sore throat, pigmentation, acne and pimples.
7. Manila tamarinds are exceptionally high in vitamin C, which bolsters the **immune system**, staves off **strokes** and reduces **phlegm**.
8. It's also full of **cancer-fighting antioxidants**
9. Its high **thiamine** content helps the body convert sugars into energy, which impacts the mood: greater conversion helps stabilize stress levels.

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Ficus religiosa: a sacred plant across India

Suhani Girish Parekh

Varied religions across India have many rituals and traditions of their own. Amongst these Hinduism is considered as one of the oldest religion where profound importance is given to plants and animals both. One such example is *Ficus religiosa* commonly known as peepal tree throughout India. This tree is found to be sacred amongst the followers of Hinduism, Jainism and Buddhism. There are many reasons why peepal tree is worshipped as sacred plant over here. In Brahma purana it is mentioned that Ashwatha and Peepala were two demons who used to lure people towards this tree to kill them. Later they both were killed by Shani. Hence many people touch and worship peepal only on a Saturday. Lakshmi, the Goddess of money is also believed to inhabit the tree on Saturdays, so women tie red cloth or red thread around its trunk to fulfill their wishes. The Brahma purana and Padma purana explain that when the demons defeated the Gods, Lord Vishnu hid himself in the peepal. So immediate worship to peepal can be offered instead of visiting his temple. Skandapurana explains peepal as the symbol of Vishnu. He is believed to have born under this tree. Some believe the tree houses trimurti, the roots being Brahma, the trunk being Vishnu and the leaves being the Shiva. It is also considered that all the three gods do meetings under this tree related to the Universe. Worshipping the peepal tree helps in controlling the thoughts, removes obstacles in marriage, financial growth and brings multiple source of income. The women worship this tree on the 15th of all months which falls on Monday, i.e. Somvari Amavasya. They pour water and milk on its roots and also tie thread around its trunk 108 times. It is believed that these threads bring the tree spirits which ultimately help the worshipper. The tree is considered to have a special place in heart of Lord Hanuman. It is believed that Lord Rama's wife sat under this tree when she was abducted by Ravan in Lanka and Hanuman witnessed her hardships sitting on the branch of this tree. As per Hindu mythology, our ancestor's souls reside in this tree. During the annual ceremonies to the ancestors, peepal trees are worshipped. It is believed that evil spirits cannot reside in a peepal tree and therefore is auspicious. The tree is well known as 'Bodhi' tree because Gautam Buddha sat under its branches and achieved enlightens (Bodhi). Thus Bodhi tree is well known symbol of Happiness, Prosperity, longevity and good luck. The medicinal breeze given out by the peepal tree is said to be highly beneficial to pregnant woman. Therefore for a painless delivery and the welfare of the mother and the kids born, it is advised that the pregnant women go around the tree a few times on a regular basis. The canopy of the peepal tree is said to be the most favourite residence of Lord Ganesha. So in many villages we see the images of Lord Ganesha installed and worshipped under this tree. This tree is considered to be the largest provider of Oxygen along with neem and Tulsi. It is said that this tree can uptake carbon dioxide even during night, hence making the environment pollution free. Hence it is also a life remediate tree which is needed to be saved and multiplied particularly in cities to cut down carbon emissions.

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Ancient Ayurvedic systems of medicine as the seeds for Modern healthcare Systems

Pujan Nainesh Pandya

The traditional knowledge of medicines dates back to ancient times wherein, the only source of healing was medicinal plants. Ancient folklore and the ancient systems of medicines of the Asian subcontinent utilized the medicinal plants as the basic source of medicines for various anomalies. An increasing use of herbal products for health-care and research in this global arena of knowledge plays a magnanimous role for the benefit of the large population in the developed and the developing countries. The seeds of Ayurveda are the source of research for developing various medicines for the huge population which plays a vital role in global health care.

The literal meaning of the term Ayurveda terms as “the science of life”. Ayurveda is considered as a complete system of medicine in itself. It encircles the needs of well being of the mankind through different aspects ranging from physical, philosophical and spiritual needs for healing. Concept of health as described by World Health Organization is similar in approximation with the concepts of health as devised in the Ayurveda. Dietary regulation is highly emphasized in the Ayurvedic systems as it has a considerable influence on the overall health of the individuals. Food is the basis for producing the *Rasa* which is vital matter of the body that supports the daily activities of life. Commonly used condiments in the Indian daily food such as turmeric, ginger, flax seeds, sesame seeds, fenugreek seeds, carom seeds, pepper seeds etc. possess tremendous healing properties in itself. They have the medicinal properties which are helpful for healing in Ayurveda practices. Common names of certain medicinal plants with huge nutraceutical properties include Guggal, Shatavari, Neem, Garcinia. Maricha, Haritaki, Guduchi, Ashwagandha etc. are of the primary use in the ancient medicinal systems. Some of these medicinal plants are worshiped by the sub-populations of the Indian origin which proves their impact on the lives of the people. Supplementation of various nutrients also plays a major role in the treatment of individuals in Ayurvedic system. Emergence of the modern nutraceuticals industry dates back to the Ayurveda. Exploration of the Ayurvedic medications in different formulations further plays an interesting role in development of diverse drugs for the various diseases pertaining to the mankind.

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Havan: An Ancient Experiment for Nasal Drug Delivery

RASHMI YADAV

India a land of virtues and ethnicity need no introduction for its mystic ethos. The science behind the beauty of Indian culture is remarkably fascinating. *Havan* means “to offer” in Sanskrit, is a fire ceremony, which is an important ritual of Hinduism as well as modern Buddhism and Jainism. This ritual process eternally involves kindling and consecrating the fire in a specialized square fire pit (Agnikund) using *havan* samagri (mixture of sacred herbs). Worldwide recognized Aromatherapy is nothing but encompasses the same principle of *havan*. It most importantly consist essential oils of plants, aroma lamps and vaporiser.

Havansamagri is made of mainly four types of ingredients: 1- Keetanu Nasak (Anti-Bacterial) 2- Sugandhit (Full of Fragrance) 3- Swasthya Vardhak (Medicinal action Property) 4- Paushtik (Healthy Nature). *Havan* samagri includes the mixture of herbs containing volatile oils which are extracted from medicinal plants such as Saffron (*Crocus sativus*), Jatamansi (*Nardostachys jatamansi*), Coconut (*Cocos nucifera*), Sesame seeds (*Sesamum indicum*), Clove (*Eugenia caryophyllus*), Nutmeg (*Myristica fragrans*), Nagkesar (*Mesua ferra*), Tagar (*Valeriana wallichii*), Agar (*Aquilana malaccensis*), Nagarmotha (*Cyperus rotundus*), Ber (*Zizphus jujube*), Phoolmakhane (*Nelumbo nucifera*), Mango (*Mangifera indica*), Ghee, Camphor laurel (*Cinnamomum camphora*), Guggal (*Commiphora weightii*), Almond (*Prunus amygdalus*), Gular (*Ficus racemosa*), Chirongi (*Bauchanania lanzan*), Kapurkachri (*Hedychium spicatum*) and Red sandal (*Pterocarpus santalinus*)

Havana scientific experiment seems to be designed by the ancient scholars to fight with diseases of the brain. *Havan* Samagri are offered in the fire of medicinal woods ignited in a specially designed inverted pyramid shaped fire pit or container (called agni-kunda). The specific shape and size of the agni-kunda, the arrangement of wood pieces in it, the time-frequency and amount of *havansamagri* account for controlled chemical processing in the fire and lead to sublimation, chemical conversion and/or transformation into vapor phase of the herbal/plant medicinal preparation leading to release of medicinal phytochemicals. Due to high temperature of fire the vapours of these oils enter into the central nervous system through nasal route. The routine of performing *havan* might keep the threshold value of the therapeutic components in the body. The electromagnetic waves generated thereby compounded with the sonic signals encoded in the mantras help in intensifying and transmitting the desired benefits of yagya in the surroundings atmosphere and far beyond. The process of yagya magnifies the advantages of the desirable medicinal phytochemicals.

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WHY IS THE BETEL LEAF SO SIGNIFICANT IN HINDU TRADITIONS?

SWATI JAYSWAL



Betel leaf is commonly known as “PaanPatta”, which is a symbol of prosperity and a magical ingredient of Ayurveda. It also plays an important part of religious customs and traditions. It is the refreshing and evergreen creeper, holds a special place in Hindu tradition.

Use of Betel leaves in rituals performance:-

In south India, a betel nut and a coin are placed on a betel leaf to be offered as “Dakshina” for priests and elders. Likewise, Assamese offer a betel leaf to guests after having a meal. It is well known tradition to chew “Paan” especially after meals as it acts as a digestive. While performing various religious rituals, it is tradition to embellish the Kalash (pot) using betel leaves as it purifies the water.

The creeper of betel leaves is called *nagvel* (serpentine creeper). The *nagvel* has the ability to attract frequencies of the earth and the Brahma region and is considered as a link connecting the two regions. Since it is *sattva* predominant, if a menstruating woman plucks betel leaves, then the creeper dries up. This is because when a menstruating woman comes in the environment of a *nagvel*, due to the effect of the friction between the *raja-tama* frequencies emitted by her body, the *sattva* predominant particles in the environment disintegrate. Hence, the creeper shrivels or black spots appear on its leaves.

As a symbol of marriage and love:-

According to the traditions in many South-East Asian countries, a combination of Betel leaf and Areca nuts is inseparable as they symbolize loyalty in love and a strong bond. Thus, it become a tradition to chew a Betel leaf and Areca nut when the bride and groom’s parents talk about their wedding plans for the first time to impart good luck.

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FENUGREEK AS A NATURAL THERAPY FOR INDIAN SOCIETY

ANJALI SHUKLA

Fenugreek (*Trigonella foenum graecum*) is an annual plant belongs to the family Leguminosae. It is the famous spices in human food. The seeds and green leaves of fenugreek are used in food as well as in medicinal application that is the old practice of human history.

Seeds of fenugreek spice have medicinal properties such as hypocholesterolemic, lactation aid, antibacterial, gastric stimulant, for anorexia, antidiabetic agent, galactagogue, hepatoprotective effect and anticancer. These beneficial physiological effects including the antidiabetic and hypocholesterolemic effects of fenugreek are mainly attributable to the intrinsic dietary fiber constituents which have promising nutraceutical value.

The medicinal value of fenugreek seeds is mentioned in Ayurvedic texts as well as in Greek and Latin pharmacopoeia. The Ayurvedic texts praise this herb for its power as an aphrodisiac, but modern vaidyas seem to be using it more for digestive and respiratory problems stemming from an excess of kaph (phlegm) and vat (wind).

Other uses

- The stems and leaves of the plant is very commonly cooked as a winter vegetable.
- Seeds are used year-round as a flavoring agent for various dishes.
- The seeds are also eaten raw as sprouts and used medicinally.
- These days it is used as food stabilizer, adhesive and emulsifying agent due to its high fiber, protein and gum content.
- In soothing Irritated skin by the external application of fenugreek.

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Achyranthes aspera as Ethno-medicinal Plant of India

DHRUV PANDYA

Since the beginning of human civilization, medicinal plants have been used by mankind for its therapeutic value. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Traditional medicine has remained as the most affordable and easily accessible source of treatment in the primary healthcare system of resource poor communities in India. A huge interest always exists in exploring nutraceuticals from plant materials to replace synthetic drugs in order to overcome their adverse effects and also for economic reasons. *Achyranthes aspera* commonly known as “chirchira or chirchita” belongs to family Amaranthaceae. From the ancient times the tribal and rural people use this herb in a variety of disorders. Crushed plant is boiled in water and is used in pneumonia. Infusion of the root is used in bowel complaints. Decoction prepared from the whole plant is given for inflammatory conditions of the body. Root decoction is helpful to cure abdominal disorders. Root of *Achyranthes aspera* is used to clean the mouth and to cure halitosis. Infusion of twig is also used as a wash for toothache. Root extract is used as an eye drop at bed time for night blindness. The flowering spikes or seeds, ground and made into a paste with water, are used as external application for bites of poisonous snakes and reptiles. Inhaling the fumes of *Achyranthes aspera* mixed with *Smilax ovalifera* roots are suggested to improve appetite and to cure various types of gastric disorders. Ash of the plant is applied externally for ulcers and warts. The crushed leaves are rubbed on aching back to cure strained back. Paste of the roots in water is used in ophthalmia and opacities of the cornea. Paste of fresh leaves is used for allaying pain from bite of wasps. Gujjar communities inhabiting Rajaji National Park, Uttarakhand (India) and found that *Achyranthes aspera* is being used for treating toothache, wound healing, asthma etc. Gujjars inhabiting Rajaji National Park use fresh stem of the plant to cure toothache. Leaves are crushed and applied on wounds. One teaspoon of crushed root is given with water sugar to infant thrice a day to cure diarrhea. Seeds are boiled in milk and eaten for few days to control blood pressure. The plant shown many pharmacological activities like spermicidal, anti-allergic, cardiovascular, nephroprotective, antiparasitic, hypoglycemic, analgesic and antipyretic. Many traditional uses are also reported like antiasthma, anticholera, purgative and laxative, in various types of gastric disorders and in urinary tract infections which are being studied till today and there is ample scope of research. Thus, *Achyranthes aspera* is a quite promising multipurpose medicinal plant and so clinical trials should be performed to prove its efficacy.

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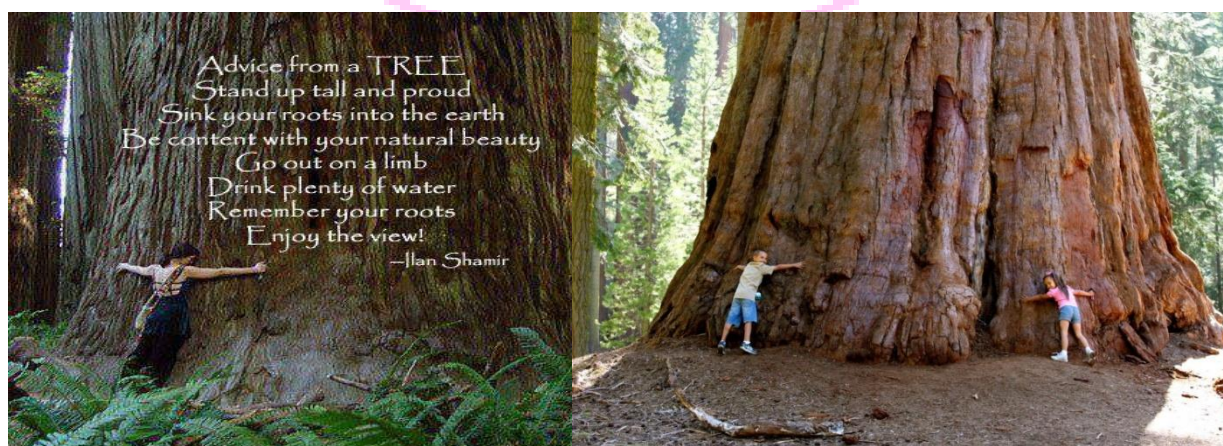
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LESSONS FROM NATURE

DR. ARCHANA MANKAD

Nature has bestowed us with its bountiful wealth of plants. We utilize most for our well-being directly or indirectly. Some of these plants are truly revered for their excellent properties. Many plants have healing properties, while some have pleasing effects on our senses. Many plants fulfill our appetite while others are providing us with all that is needed to live a comfortable life.

Our lives are also inspired by nature. Just like plants we need to be useful to our society directly or indirectly. We may not have healing powers to heal the wounds on the body but our words and actions heal the mind. We can be giving to the needy. We can provide and share. Nothing in nature lives for itself. Rivers don't drink their own water. Trees don't eat their own fruit. Instead a tree **teaches us to be rooted to our CULTURE...** Imbibe goodness from our **ROOTS...** Stand tall inspite of strong winds that can erode... Feed the hungry... Give cool shade and as far as possible inspire by sheer magnanimity of the character. The oldest tree, Giant Redwood is about 2,200 years old; many others in the wild exceed 600 years. The reason redwoods are able to reach such high ages is their unusual ability to survive. Resistance to natural enemies such as insects and fire are built in features of a coast redwood. Diseases are virtually unknown and insects damage insignificant thanks to the high tannin content of the wood. Thick bark and foliage that rests high above the ground provides protection from all but the hottest fires. One of the most amazing things about the redwoods is that they do not necessarily need a seed to form a new tree. Redwoods have the ability to produce sprouts whenever the cambium—the living tissue just beneath the bark—is exposed to light. New sprouts may come directly from a fallen branch, a cut stump or a burnt tree's root. Some redwoods can sit patiently in the shade of the older trees for decades. Yet as soon as the elder tree falls or is cut down, breaking the thick canopy and allowing new light to enter the forest, the suppressed redwood spring up with new growth. The giants teach us a lesson in humility. With their size and age they give the small journey of our human lives a larger perspective. Their majesty and grace tells us stories of patience and endurance. Their resilience fills us with hope and reminds us that despite all the calamities and hardships in life, we carry within ourselves the ability to regenerate and renew our spirit. (<https://healingforest.org/2016/09/30/lessons-from-old-trees/>)



GLIMPSES OF GUJARAT UNIVERSITY BOTANICAL SOCIETY (GUBS)

The Department organized a Workshop on **Bioinformatics Leads in Gujarat 2017 (BLG 2017): Advances in computer aided drug design & discovery** on 21st – 22nd December 2017. The goal of workshop was to integrate and visualize drug designing and discovery using software by V - Life Sciences technologies. Participants and Invited Faculty from various academic and research institutes like Gujarat State Biotechnology Mission (GSBTM), Gandhinagar, Gujarat Cancer Research Institute(GCRI), Ahmedabad, and different departments of Gujarat University participated in this workshop.

The event was inaugurated by Dr. P.M.Patel, Registrar Gujarat University and President of the function, Guest of Honour, Prof. Rajshri Bhatt, Director School of Science, and Chief Guest and distinguished resource person, Dr. Sami Mukhopadhyay from V - Life Sciences technologies. Welcoming the guests Dr. Archana Mankad justified the need of such a workshop that would actually provide hands on training for the researchers to use the said software and take their research to a higher level. Dr. Rajshri Bhatt blessed the august gathering and conveyed her best wishes to the workshop. Dr. P.M.Patel expressed his appreciation and delight in meeting young researchers who are enthusiastic to learn new technology. Dr. Saumya Patel Delivered the formal Vote of Thanks. Dr. Sami conducted the technical sessions with a lot of dedication and commitment.



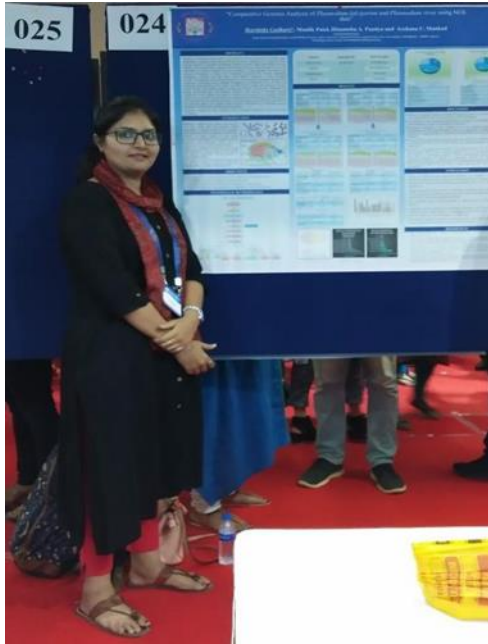
The participants benefitted from brain storming during the technical sessions. Delicious lunch kept their energies up. Participants received a certificate of participation.

The research scholars and staff from Department of Botany, Bioinformatics & Climate Change Impacts Management participated in the **International conference:2017** on NexGen Genomics, Biology, Bioinformatics and Technologies (NGBT-2017) Conference to

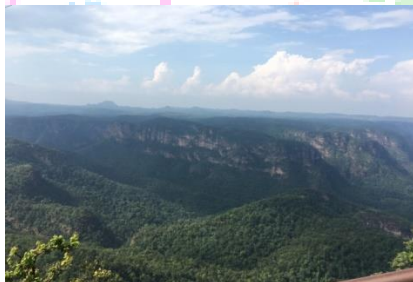
be held from 2nd – 4th October 2017 in Bhubaneswar, Odisha, India organized by SciGenom Research Foundation (SGRF), Chennai, India and was jointly hosted with the Centre for the Commercialization of Antibodies and Biologics (CCAB), Toronto, Canada, Toronto Recombinant Antibody Centre (TRAC), Toronto, Canada, Institute of Bioinformatics (IOB), Bengaluru, India, Kalinga Institute of Industrial Technology (KIIT University), Bhubaneswar, India and National Institute of Science Education and Research (NISER), Bhubaneswar, India. This was the seventh international conference hosted by SGRF Conferences, the educational outreach arm of SciGenom Research Foundation (SGRF), setup to promote science research and education in India/Asia Pacific region.

This conference was an ideal platform for an early results and work done by the various international forum, consists of researchers, education scientists, technologists and industry representatives who are experts in the various bioinformatics area. Also, this forum acts as a strategic think tank to enhance a constructive dialogue and collaboration on themes relevant human health and to present the latest research results in all areas of Genomics. The conference has covered basic biology, cellular signalling, cancer, plant biology and the application of NextGen sequencing and genomics technologies for basic and translational science in all areas of biology including human genetics, drug discovery, clinical medicine, biomarkers, diagnostics, animal, plant and agricultural sciences. There have been many exciting developments in genomics technologies and their applications and this year's Conference continues to be an eye opener to the possibilities that the field of Genomics can offer, said Dr.Sekar Seshagiri, NGBT Conference Chair. The conference also featured over 200 posters and the paper presented by research scholars entitled “Small RNA profiling of *Carica papaya* using next generation sequencing” and “Comparative Genome analysis of *Plasmodium* sp. And identification of unique signature with NGS Technology” in the conference was published in the conference abstract book in the perspective section.

The conference included 1000 delegates from the various bioinformatics field, 13 keynote lectures and 80 talks has been delivered from all Speakers and delegates representing leading universities and research institutions from India and abroad were at the meeting. It provided the scholars with a valuable learning experience. It was an excellent opportunity to gather, interact and exchange their findings and views during conference sessions, coffee breaks and conference dinner. Consequently, they interacted with many academicians and professionals from different countries who have similar research interests.



The staff and M Sc Botany Sem III students of the department went to **Pachmarhi (M.P.)** and Satpura forest range area for a **Botanical Excursion** during from 05th – 11th October, 2017. Botanical excursion is highly essential for studying vegetation and its pattern in natural condition .. It gives knowledge about forest vegetation pattern and distribution of habits in different habitat .Prof. Dr. Bharat Maitreya and Dr. Nainesh R. Modi accompanied the students.



Satpura forest range
caves

Forest area visit

View from Pandav

Pachmarhi is a hill station in Madhya Pradesh state, situated at a height of 1067 metre and known as SatpurakiRani. The town is not very large and most of its area is under Cantonment Board. It is a popular tourist retreat. Pachmarhi and surrounding forest areas have rich and rare flora- fauna. It is a biosphere reserve. There are some beautiful waterfalls which support a rich diversity of cryptogams and phanerogames. Pachmarhi is connected through rail – nearest railway station being Pipariya and road.



Little fall

Duchess Fall

RajatPrapat

Pachmarhi and surrounding satpura forest range area is known for its Natural water falls namely Rajatprapat, Bee fall, Duchess fall, Apsaraviharfalls,down falls and little falls. It is also known for religious places like, Chhotamahadev, Badamahadev, Jatashankar, Chauragadh, Guptmahadev, Dhoot akhilesh, Pandav caves. In addition there are many natural picturesque places like Dhoopgadh, Reechhgadh, green valley, Handikho, Badizeel, lovers point etc.

Botanical study tour was arranged for the study of vegetation in forest area of Pachmarhi and surrounding satpura forest range. The students had a comfortable journey and accommodation. The students visited the various forest areas with official permission. The help of local plant identifiers and forest guide was very timely and much needed. All the students spent a lot of time at various waterfalls and forest area studying the lower plants in their natural habitat. Due to Forest department restrictions the collection of plant material from the forest is banned, so the rich diversity of plants was only studies on the spot and photography was done.

Pachmadhi forest area have rich diversity of Bryophytes,Pteridopytes and Angiosperms. The observed species of bryophytes are:*Targionia*, *Riccardia*, *Notothylus*, *Plagiochasm*, *Fimbriaria*, *Polytricum* etc. in their natural condition nearby waterfalls



Field excursion in forest area

The observed species of pteridophytes : *Psilotomnudum* , *Lycopodium* , *Selaginella sp.* *Isoetespanchanani*, *Ophioglossumnudicaule*, *Botrychiumdaucifolium*, *Angiopterisevecta*, *Osmundaregalis*, *Lygodiumflaxuosum* , *Dicranopterislinearis*, *Cyatheagigantea*, *Alsophilaglabra* , *Nephrolepisacuta* , *Leucosterigapulchera*, *Goniopterisprolifera*,

Dryopteriscochleata, Polybotreaappendiculata, Actinopterisdichotoma, Adiantumcapillus, Cheilanthes tenuifolia, Pteris erecta, Gymnopteris contaminans, Thamnopteris, Polypodium gracilis, Tectaria sp. etc.,



Psilotum nudum

Floscopascandens

There are many plant species of Angiosperms growing in wild and some cultivated. Vegetation found was very diverse in habit. The observed plant species of angiosperms in Tropical dry deciduous forest: *Tectonagrandis, Anogeissus latifolia, Terminalia alata, Pterocarpus marsupium, Shorea robusta, Diospyros melanoxylon, Adina cordifolia, Sterculia urens, Buchanania lanzan, Flacourtiaindica, Saccopetalum tomentosum, Chloroxylon swietenia, Hardwickia binata, Boswellia serrata, Soyamidafebrifuga, Mallotus philippensis etc., Strobilanthes, Aampelocissus, Clematis sp., Phragmites karka Woodfordia fruticosa, Wrightia tinctoria, Abutilon persicum, Corchorus aestuans, Eulaliopsis binata, Helicteres isora, Hibiscus subdariffa, Soyamidafebrifuga, Triumfetta rhomboidea, Urena lobata, Casearia elliptica, Gardenia turgida, Xeromphis pinoisa, Milletia extensa, Cymbopogon martini, Argemone mexicana, Casearia graveolens, Celastrus paniculata, Putranjiva roxburghii, Schleicheria oleosa, Semicarpus nocardium, Eucalyptus sp., Kydiacalcina, Cymbopogon martini, Vetiveria zizanioides, Dioscorea bulbifera, Cyperus spp., Gymnema sylvestris, Eulophia herbacea, Securinegaleucopyrus, Thysanolaena maxima, Litsea glutinosa, Semicarpus nocardium, its found that Lantana camara, Parthenium hysterophorus, Ageratum conyzoides, Elephantopus scaber etc. have encroached upon many localities of the forest and eradicated other local species. Eulophia herbacea, Berberis asiatica, Drosera indica, Drosera burmanii, Begonia malabarica, Utricularia exoleta and Nervilia aragoan.*

The Department of Botany, Bioinformatics and Climate Change Impacts Management organized a state level seminar on **Integrating Climate, Energy Transformations and Youth (ICETRAY 2018)** on Friday, 19th January 2018. The day started with registrations and breakfast for the UG/PG/Research scholars and Faculty registered as participants. There were more than 200 registered participants from Universities of Gujarat like M S University-Baroda, S P University-Anand, Bhavnagar University, HNGU-Patan, Colleges of Gujarat University like K K Shastri Science college, M G Science Institute, C U Shah Science College, St Xavier's college, President College, Khyati college, PG departments of Gujarat University like Department of Botany, Bioinformatics and Climate Change Impacts Management, Department of Microbiology, Biotechnology and Department of Environment Science, resource persons from GEMI, GERMI and Climate Change Department, Government of Gujarat, Gandhinagar.

The programme began with the Inaugural function. Chief Guest, Shri Sanjiv Tyagi, IFS, Director GEMI, Guest of Honour, Shri Mukesh Shah, Joint Secretary, Climate Change Department, Government of Gujarat along with Dr. Archana Mankad, Professor and Head of Department were on the dais. The President of the function, Honorable Vice Chancellor, Dr. Himanshu Pandya, being unable to preside over, had conveyed his best wishes for the event. The programme started with the University song as a mark of respect and gratitude to the University. This was followed by lighting of the lamp and seeking the blessings of the almighty God for successful completion of the tasks for the day ahead. There was a floral welcome of the dignitaries on the dais followed by a formal welcome. Dr. Archana Mankad delivered the formal welcome speech and justified the need of such a seminar for the students and researchers in the field of climate change. The participants were motivated to present posters and the academic inputs by the professors were duly acknowledged. The seminar was one of the many such academic events organized by the Department as Gujarat University Botanical Society (GUBS). GUBS is a society of budding and blossomed learners and researchers from the Department of Botany, Bioinformatics and Climate Change Impacts Management that provides a platform for curricular, co-curricular and extra-curricular interactions and learning. The Department of Botany, Bioinformatics and Climate Change Impacts Management has been constantly striving and aiming at all round development of the students. The Seminar theme, energy transformation is the thrust area of innumerable initiatives. Everyday new aspects are being explored that have redefined our way of utilizing energy in an environment friendly manner. The seminar is one such initiative to bring the learners and the learned under one roof for Brainstorming on various challenges faced in the sustainable utilization of energy for a better tomorrow.

Shri Mukesh Shah in his opening remarks gave a brief overview of Government's perspective and what the Climate Change Department can offer to young researchers. Shri Mukeshbhai presented his views further, only Gujarat University in whole Gujarat offers this unique course on climate change department and this has been duly recognised even by our then Chief Minister and Now Prime Minister of India, Shri Narendra Modi in his book, 'The Unconventional truth'. He also talked about the solar power, energy system and government policies for the same. Climate change is multidisciplinary subject and is one of the most important topic today. Dr. Nainesh Modi delivered the formal vote of thanks. Ms. Snigdha Dixit anchored the programme very gracefully. Dr. Sanjiv Tyagi, the distinguished resource person delivered a very thought provoking and motivating lecture. He also shared the video made by him and his team about the various activities of GEMI. Dr. Tyagi was able to successfully convey to the participants the use of methods from mother nature to solve the issues of climate change. This was followed by a lecture by Dr. Kunal Shah from GERMI. This lecture was focussed on waste to energy. The presentation brought the significance of effective solid waste management in the lime light and the technologies that can help us manage it.

The very energetic gujarati menu attracted all the participants as they enjoyed Kesarshrikhand –puri-bateta nu shaak, undhiyuna along with mixed bhajia, kadhi, bhaat and

paper. After lunch the evaluation of posters was done by a panel of distinguished judges and best poster at all levels was selected.

The much awaited moment of the day for the participants was the announcement of best poster awards. This was done by Dr. Archana Mankad and the prizes were distributed to the winners by the experts. Best poster award included a certificate and cash prize to winner-one in each category.



Lighting the lamp to mark the inauguration

Welcoming Shri Mukesh Shah



Welcoming Dr. Sanjiv Tyagi, IFS



Formal Welcome



Shri Mukesh Shah- Blessings



Dr. Nainesh Modi- Vote of Thanks



Dr. SanjivTyagi, IFS Resource person

Felicitating Dr. SanjivTyagi



Dr. Kunal Shah, Resource person

Felicitating Dr. Kunal Shah



Lunch time



Poster presentations



Prize Distribution

The Department organized a state level Seminar on **Phytoresources for a Better Tomorrow (PBT 2018)** on Wednesday, 24th January 2018. We are on the threshold of significant researches in plant sciences. Every Plant is important be it a valuable source of nutrition or medicine, it gets utilized in one way or the other. Identifying the hidden potential in diverse plant groups can widen our horizons of research. We have been able to identify a few plants that can be used for cleaning our environment but much more needs to be done. Exploring newer technologies like Bioinformatics can help us identify solutions to complex problems of health and environment. The seminar was focused on plants for better health, clean environment and use of Bioinformatics to assist in both. Dr. Himanshu Pandya, Honourable Vice Chancellor, Gujarat University and President of the function, Guest of Honour, Dr. Rajshri Bhatt, Director, School Of Science, Chief Guest, Dr. P.M. Patel, Registrar, Gujarat University were on the dais during the Inaugural Function alongwith Dr. Archana Mankad. Welcoming the guests, Dr. Archana Mankad justified the need to study plants in the perspective of better health and to clean the environment. Blessing the august gathering, Dr. Rajshri Bhatt expressed her good wishes and congratulated the department for organizing the event. Dr. Himanshu Pandya delivered a very motivating presidential address highlighting the urgent need to focus on research and innovation. He emphasized on the title of the seminar i.e., better *tomorrow* and illustrated the need to ponder over the theme effectively. Dr. P. M. Patel was unable to attend and had conveyed his best wishes. Dr. Nainesh Modi,

Organizing Secretary delivered the formal Vote of thanks. The first lecture on **Medicinal wealth focusing on the theme Plants for better health** was delivered by Prof. M. H. Parabia, Retd. Professor from Bioscience Department, VNSGU, Surat. He not only sensitized the participants towards understanding the medicinal value of plants but also illustrated the need to explore the efficacy of the phytochemicals in various ailments. The second lecture on **Phytoremediation focusing on the theme plants for clean environment** was delivered by Prof. M.N.Reddy, Professor, Department of Bioscience, VNSGU, Surat. He explained the prospects on phytoremediation and the challenges faced during such research. Lunch provided the much needed energy to present the posters and compete for the prizes. The poster session witnessed enthusiastic participation by all and the winners received certificate and cash prizes during the Valedictory function. All participants received certificates of participation.



Lighting the lamp to mark the inauguration



Welcoming Prof. Himanshu Pandya



Welcoming Prof. Rajshri Bhatt



Prof. Rajshri Bhatt blessing the participants



Prof. Himanshu Pandya- Presidential Address



Dr. Nainesh Modi - Vote of Thanks



Welcoming Prof. M. H. Parabia Prof. M. H. Parabia delivering Invited lecture



Welcoming Prof. M.N.Reddy Prof. M. N. Reddy delivering Invited lecture



Lunch

Prize Distribution & Felicitating the Judges



Prize Distribution & Felicitating the Judges



Prize Distribution & Felicitating the Judges





The memorable moment

The members of GUBS participated in the Garba competition during Navratri in the department with a lot of festive fervour and excitement. Alongside Arti thali competition was also arranged for the members. Members in their best traditional costumes danced their heart out on the garba tunes and won prizes.

The Members of Gujarat University Botanical Society (GUBS) welcomed the New Year with fun filled event **EUPHORIA 2018** representing joy, happiness, delight, excitement and so on. Thus, the annual day's celebration began. The first day of the celebration began with sports. Nothing is better than sports can keep everyone active. Relay race, lemon and spoon, book on head and chess were some of the sports that were enjoyed by everyone. The message day was celebrated in which each one had to write a message on the theme "friendship". The next day that was celebrated as talent day and students enthusiastically participated and won a lot many prizes. The activities included solo song, group song, mehndi competition, acting and mimicry. Group day was celebrated wearing smiley badges as a symbol of happiness. There was a seminar on Home Gardening and alongside a Rangoli competition was organized but the Rangoli's were to be made using flowers and leaves. The most awaited food festival witnessed enthusiastic participation from all. The various categories for all the delicacies

were snacks, traditional foods , sweets, beverages etc. and a special category was there for innovative food items alongwith salad decoration and vegetable carving which were also placed in the competition. The Seminar ICE-TRAY was enjoyed by everyone; the seminar was followed with the best from the waste competition and was named as green day. The visible spectrum day was celebrated where the theme – NATURE was given for the competitions like painting, sketching, and scientoon drawing. Creative day was celebrated where students participated in videography and photography based on the theme – HAPPINESS. The seminar Phytoresources for a better tomorrow (PBT-2018) was also included as a day to appreciate the value of plant wealth and its utilization. Euphoria 2018 was concluded with executive and saree day where students and research scholars participated in the fashion show.



Home Made Chocolates



Mehndi competition



GUBS wall full of creative messages





Nonteaching staff participating in Euphoria

Rangoli with flowers



Celebrating EUPHORIA



The Memorable Moment

The staff and students participated in Career counselling as part of an outreach activity for the outgoing TY B Sc students in various Science Colleges in Ahmedabad. Dr. Nainesh Modi, Dr. Bharat Maitreya and Dr. Saumya Patel accompanied a group of research scholars to M G Science Institute, C U Shah Science College, R A Bhawan's College, St. Xavier's College, President College, Khyati Institute, Gujarat College, Science College, Gandhinagar. The Research Scholars and Faculty members explained the significance of study of Botany, Bioinformatics, Climate Change Impacts management and Horticultural Science and garden management courses being conducted by the Department. This gave an opportunity to the undergraduate students to interact with the group and identify their areas of interest for pursuing higher studies. The activity resulted in a lot of brainstorming as well to address employability and entrepreneurship possibilities for the students.



At M G Science Institute



At R A Bhawan's Science College



At St. Xavier's College



At Khyati Institute



At Gandhinagar Science College

The Gujarat University Botanical Society (GUBS) organized a **Hands-on training on Bonsai** Monday, 2nd April 2018. Shri Nagendra Purohit, Garden Consultant and Landscape Designer conducted the session as a distinguished resource person. Ms. Hetal Shah, Member, Ahmedabad Bonsai Club and resource person for the programme also helped the participants in making the Bonsai.



Inauguration and Welcome



Welcoming Shri Nagendra Purohit



Learning the Basics of making a Bonsai



Mr. Necklin Pithwala Aspi, Gujarat College



Nagendra Sir helping Dr. Nirali Vora Understanding the trimming and designing of a bonsai



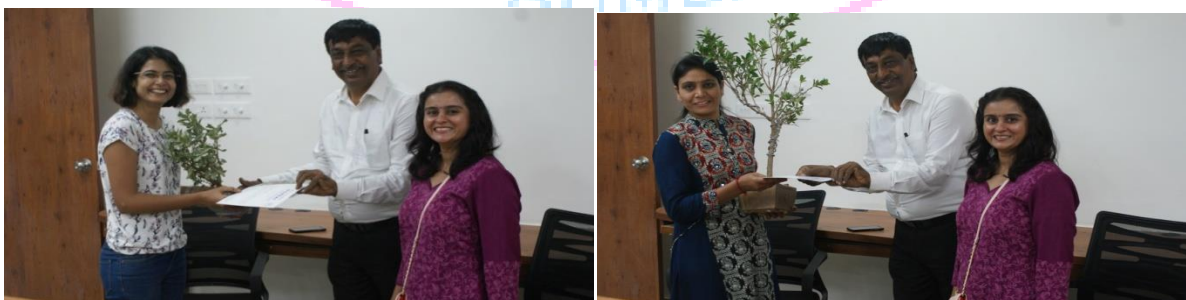
Administrative staff of the department

Ms. Hetal Shah helping Ms. Heena Patel



Understanding the trimmings and designing of a bonsai

Joy of Accomplishment



Certificate distribution



Memorable moment

The participants were given a unique kit which included ceramic pots, soil, pebbles, fertilizer, and potted plants. They were also given photocopies of literature about various styles. The students of M Sc Horticultural Science and Garden Management helped all participants in assembling everything. The selection of the plant followed by selection of the style was done according to the tree. Each tree was first cut to give the required size and then wired to align the branches. Then they were potted in the selected pots. All participants enjoyed snacks and cold drinks. The participants received a Certificate of Participation.

The Gujarat University Botanical Society (GUBS) celebrated its **annual function** on Friday, 6th April-2018. The function started with a Bird's eye view of the activities throughout the year in the form of a video show. Prof. Himanshu Pandya, Honourable Vice Chancellor, Gujarat University was the Chief Guest of the function. The programme began with a quick overview of the activities of GUBS in the year 2017-18. The members had enthusiastically participated in various curricular, co-curricular and extracurricular activities and competitions and won lots of prizes. The Secretary Ms. Pooja Sharma gave the secretary's report while the Treasurer, Mr. Dhruv Pandya presented the treasurer's report. The semester II bid farewell to the semester IV students while semester IV reciprocated with a thanksgiving message. The winners were given certificates and prizes by the faculty members of the department. Dr. Archana Mankad announced the much awaited Golden Petal Awards and these were given to the awardees by the Honorable Vice Chancellor, Dr. Himanshu Pandya. A special Golden Petal Award for Visionary of the year was awarded to Dr. Himanshu Pandya for his extraordinary vision in shaping the development of the department and the University. The fun filled event ended with class wise group photographs and sumptuous lunch.



Welcoming Dr. Himanshu Pandya with a Bonsai



Secretary's Report



Treasurer's Report



Dr. Himanshu Pandya being awarded the Golden Petal Award for the Visionary of the Year.



Group Photograph- Research Scholars of Botany, Bioinformatics & Climate Change Impacts Management



Group Photograph – Semester IV Botany



Group Photograph – Semester IV Bioinformatics



Group Photograph – Semester IV Climate Change Impacts Management



Group Photograph – Semester II Botany



Group Photograph – Semester II Bioinformatics



Group Photograph – Semester II Climate Change Impacts Management



Group Photograph – Semester II Horticultural Science and Garden management



A Memorable moment

The students of M.Sc. Botany Sem-II along with Prof. Bharat Maitreya went to the Forests, Islands and Coastal areas of Goa state as part of their Botanical Excursion in February 2018. During Botanical study the group visited some important research institutes like, The National Institute of Oceanography (NIO) at Dona Paula – Goa. NIO is one of the 37 constituent laboratories of the Council of Scientific & Industrial Research-CSIR New Delhi. The principal focus of research has been on observing and understanding special oceanographic characteristics of the Indian Ocean. The results have been reported in more

than 5000 research articles so far. The institute has a sanctioned strength of 200 scientists and 100 technical support staff. The major research areas include the four traditional branches of oceanography - biological, chemical, geological/geophysical, and physical – as well as ocean engineering, marine instrumentation and marine archaeology. the institute also carries out applied research sponsored by the industry. These studies include oceanographic data collection, environmental impact assessment, and modelling to predict environmental impact.



Outside NIO



Salmaliarubra (RatoShimalo)

During the Botanical study tour, they also visited some important Sanctuaries like, Dr. Salim Ali's Bird sanctuary, which is an estuarine mangrove swamp located in North Goa. It is bound by two rivers, the Mandovi and the Mapusa. The sanctuary is part the Choroa Island, which has natural forests as well as areas under agriculture and aquaculture. The sanctuary has been selected as a pilot site for implementing the Coastal Marine Protected Area (CMPA) Project to strengthen conservation efforts and sustainable use of the biodiversity. The coastal habitat of the Mandovi estuary is under severe pressure from threats of the increasing population, tourism, mining and urban development. The various Birds observed were – Monal, Paradise flycatcher, Himalayan snowcock, Coot, Pintail, Kingfisher, Greater Spotted Eagle, White-tailed Fishing Eagle, Pallas's Fish Eagle, Grey-headed Fish Eagle, Baya Weaver, the Lesser Kestrel, Swamp Francolin, Slender-billed Vulture, Slender-billed Vulture, Eastern Imperia The various mangroves observed were species like: : *Rhizophora mucronata* , *Rhizophora apiculata* , *Avicennia officinalis* .*Avicennia marina* ,*Avicennia alba* , *Sonneratia alba* , *Sonneratiacaseolaris* ,*Bruguieragymnorhiza* ,*Bruguieracylindrica* , *Kandeliacandel* , *Excoecariaagallocha* ,*Cerriopstagal* , *Aegicerascorniculatum* , *Acanthus ilicifolius* ,*Derris heterophylla* and *Acrostichumaureum*.



Salim Ali Bird Sanctuary



Rhizophora mucronata : Germinating , Plant with stilt Roots and Vivipary Fruit

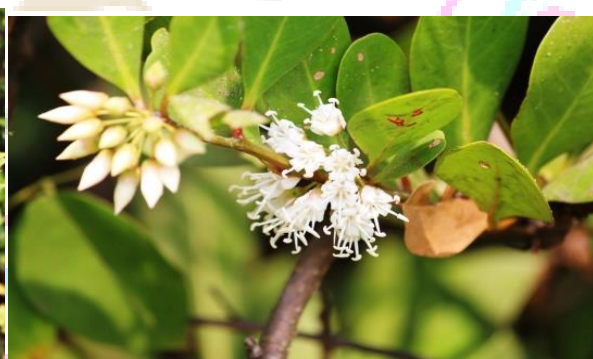
The different beaches in the west part of Goa coast of Arabian sea, visited were Calangute Beach, Anjuna beach, Baga Beach, Vagator Beach, Candolim Beach at North Goa region, Colva Beach at south Goa region and Miramar Beach, and Dona Paula beach near Panjim. The students studied the marine algae and other marine plants in their natural habitats. They also enjoyed the beach waves and relaxed in the cool sea water. A visit to Old Goa located on the banks of River Mandovi, and once also known as “Rome of the East” thanks to its magnificent churches..from the 15th century churches to monasteries lying in ruins. **Basilica of Bom Jesus** , Beautiful Sé Cathedral Church Old Goa , **Church of St Francis of Assisi and Augustine’s Tower** was very thrilling. **They also visited Shri Mangeshi temple** which is located on a hillock at Mangeshi Village in Priol, Ponda Taluka. Shri Mangeshi Temple is one of the largest, wealthiest and most popular Hindu shrines in Goa. Mythology says that Lord Shiva came to Goa after having lost everything in a game .A visit to the **the Archaeological Museum** which was founded in 1964 by the Archaeological Survey of India was truly informative. It is situated in the convent section of the Church of St. Francis of Assisi. Hours can fly by here walking around looking at the remnants of the Portuguese rule in Goa, Big Foot Cross Museum or Ancestral Goa Museum located at Loutolim, 9kms from Margao and 29kms from Panaji, the state capital. A miniature Goan village set up to recreate the rural life of old days. It is privately run by an artist called Maendra Jocelino Araujo Alvares.



There is a handicraft centre where one can get some locally made Goan artifacts, Big Foot dance floor, Big Foot restaurant, a cross, a spring known as Boca da Vaca, a bird habitat, a spice yard, rubber plantations and lots more. In this model village one can also see different miniature houses that showcase traditional occupation and social classes such as fishermen, Goan artisans, a Music school known as Escola da Musica, farmers, liquors shops, the village market, and a feni distillery.

The main highlight however at Ancestral Goa is the giant 14 meter sculpture of Saint Mirabai carved in 30 days by MJA Alvares, the enterprising artist cum museum owner. This has been cited in the Limca book of records for being the longest laterite sculpture in

India. The spice farms is a must visit place for tourists touring the state. The **Spice Gardens** boast of a serene and relaxed atmosphere with an aroma of a varied spices. Guests are greeted warmly with a home made welcome drink. The aroma of spices grown there - Nutmeg, Cardamom, Cinnamon, Vanilla, Betel nut, Pepper, Chillies fills the air. The visitors are taken on a tour of the garden where the guides explain about the type of spices, their uses and medicinal value of each. These Spice plantations practice organic farming. They also grow fruits like Cashew, Banana, Pineapple, Kokum, Green Mangoes.





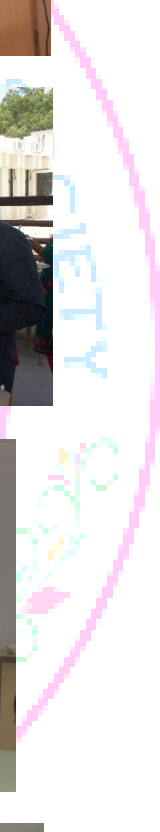
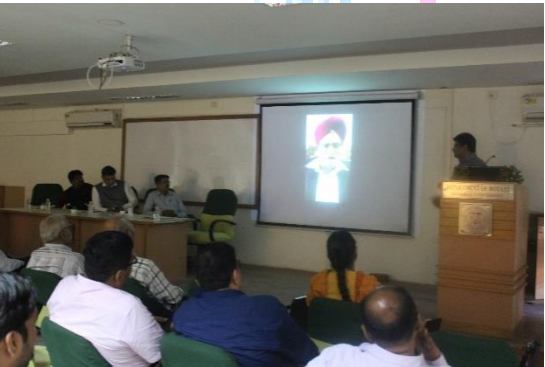
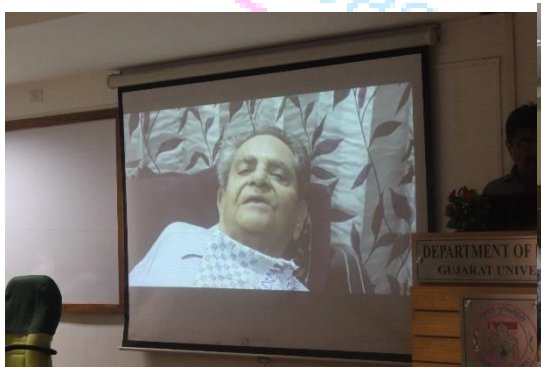
PANJI (Capital of Goa): Panaji is the Capital of Goa – a small and charming City on the left bank of Mandovi River with beautiful redroofed houses, well laid gardens, statues and avenues lined with Trees. Lush scenery with Rice paddies, Mango groves, and easy going hospitable people. Tourist can enjoy sundown River cruises on River Mandovi in the company of folk dancers and folk music. In all it was a lifetime experience to visit Goa through Konkan Railway which in itself is an engineering marvel. Prof. Bharat Maitreya led the group through the wonderful learning experiences. Botany learning gets enriched by such field exercises and provides the students with unique learning experiences. The students came back with lots of gifts, kaju and pleasant memories of togetherness.

GUJARAT UNIVERSITY LEARNED ALUMNI OF BOTANY (GULAB)

The Department of Botany, Bioinformatics and Climate Change Impacts Management organized an alumni meet for the staff and students of the department on Thursday, 3rd May-2018. The day was abuzz with nostalgia as the old students filled the air with their excitement and joy. Retired staff members Prof.O.P.Saxena, Prof. Alka Vyas and Mr. R.K.Modi were among the few who could make it inspite of their old age. Other Senior and retired alumni members who remained present were Prof. B.R.Pandit, Dr. B.C.Patel and Dr. M.P.Dave. Honourable ViceChancellor, Prof. Dr. Himanshu Pandya's gracious presence added the energy and the zing among all young and old hearts. Dr. Himanshu Pandya met everyone and spared valuable time by remaining present with the gathering inspite of his extremely busy schedule. Prof.O.P.Saxena felicitated Honourable ViceChancellor, Prof. Himanshu Pandya with a trophy as Pride of GULAB. A creative Video show of old yesteryears photographs was shown which took the group down the memory lane and brought smiles on everyone's face. Prof. A. B. Vora and Prof. A.A Ahluwalia's Video messages were presented as small video clips. Dr. Himanshu Pandya shared his vision for the Department and generated

enthusiastic participation and brainstorming for the constitution of an official body of GULAB. Suggestions that poured in were minitised and decisions would be taken eventually but all resolved that at least everyone should make it a point to meet once a year every year. The get-together ended with delicious sumptuous piping hot lunch relished by all.







Department of Botany, Bioinformatics and Climate change impacts management, Gujarat University organized a Workshop on **NGS data analysis by Strand NGS software** on 10th and 11th April 2018. The workshop was supported by Bioinnovations and Strand. Prof. Hitesh Solanki, Coordinator, welcomed the guests and assured all a fine learning experience through the workshop. Prof. Himanshu Pandya, Vice Chancellor, Gujarat University inaugurated the workshop and addressed the gathering with inspiration speech. He emphasised the need to develop technological innovations to address the problems faced by researchers for qualitative research. Dr.Saumya Patel, Organising Secretary, delivered a formal Vote of Thanks. The Workshop was aimed at providing a set of stimulating sessions using advanced NGS data analysis techniques relevant to students, faculties & researchers working in Genomics. It was conceptualised that the Participants will return to their labs with new ideas, best practices and software experiences to maximise productivity in their own research activities. Strand NGS, the next generation sequencing data analysis software offers with its best-in-class visualizations and intuitive Graphical User Interface (GUI) makes analysis and integration of sequencing data from DNA, RNA, small RNA, Methylation, and Chromatin Immunoprecipitation studies a biologist's play. The participants were not limited to Bioinformatics research scholars, but other disciplines and witnessed enthusiastic participation from faculty and industry personnel with background in Biological Sciences, Chemistry, Pharmaceutical Science and other allied disciplines of Life Sciences.

The Workshop has been uploaded on Youtube as a video for wider outreach to interested participants and the focus of the workshop was on Demonstration of alignment, analysis, biological interpretation and downstream analyses, Pre-packaged (custom) pipelines to support large, repetitive experiments Smart and intuitive workflows to optimize the analysis, Pre-packaged annotations, Export of publication quality graphs, visualizations and easy to interpret data in editable format, Visualization of raw reads, algorithm, analysis results and annotations.

All participants expressed their delight in meaningful discussions with the Resource person from Strand. A working lunch was arranged for both the days for the participants and the organizers. All participants received a certificate of participation.



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